Textbook of Medical Dentistry

For Dental–Medical Students and Practitioners

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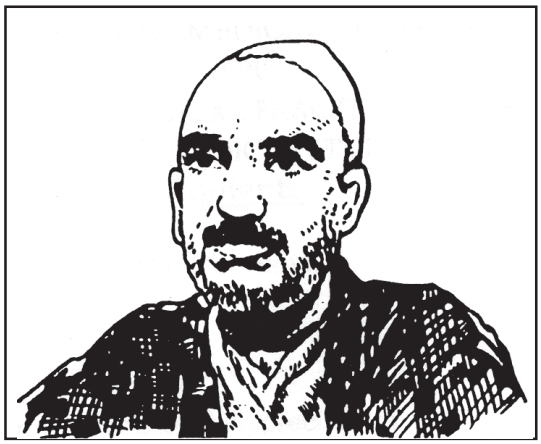
Dedicated to

My Beloved Son Sunil Pophale

and

My Inspiring Daughter Sunita Ramnathkar



سید احمد حسین امجد حیدر آبادی

کیا فائدہ فکر بیش و کم سے ہوگا
ہم کیا ہیں جو کچھ کام ہم سے ہوگا
جو کچھ بھی ہوا کرم سے تیرے
جو کچھ بھی ہوگا تیرے کرم سے ہوگا

امجد (حیدر آبادی)

We are a small insignificant part of the Universe and nothing we do more or less will ultimately matter.
Are we really capable of doing anything?
Whatever is done so far, Oh Almighty God, is due to Your kindness.
And whatever shall be done in future will only be through Your kindness and mercy.

Preface

Teeth are the part of human body and are governed by all the biological processes and anatomical connections existing in the body. Moreover, they are situated and well protected in the buccal cavity. They initiate the digestive process by chewing the foodstuff and making it suitable for interaction with digestive enzymes in the mouth, stomach and small intestine. Nature has provided all the facilities for teeth function to accomplish perfectly without any problem. Every part of oral cavity assists them in chewing from either side with the help of tongue and cheek before it is suitable to be swallowed. The salivary glands secrete saliva to moisten the morsal during the process of chewing while lips and cheeks prevent the food from coming out. The arch of the roof of the palate provides the required quantity of food to be accommodated for the processes of chewing. The swallowing process is a super-phenomena which pushes the morsal in the esophagus by temporarily closing the opening of the respiratory channel.

The teeth themselves are fixed in bone and get their blood supply and nerve supply through it. Thus anatomically, physiologically, and pathologically all the structures around affect the teeth creating the problems for practicing dentist. Moreover, systemic diseases do affect the teeth directly or indirectly along with surrounding structures of buccal cavity and provide dependable evidence for diagnosis.

Thus the purpose of keeping general medicine in the curriculum of dentistry teaching is valid and essential because without the background of general medicine, dentistry cannot be successfully practised. The practising dentist has to face emergencies connected with systemic diseases and also be vigilant about legal obligatory responsibilities answerable to Consumer Protection Court.

I remember a case of tooth extraction with continuous bleeding and diagnosed a bleeding disorder subsequently and saved the patient after giving transfusions. Thus, it becomes relevant to exclude hemorrhagic diseases, leukemia, hypertension, diabetics, etc. before submitting a patient for surgical treatment.

Again the latest and best dental material required is to be chosen having suitable mechanical and physical properties and is safe locally, and systemically to the human body at large.

The latest ideology is to save the natural tooth than to extract and cure the pathology at the earliest and mainly concentrate on prevention and by giving elaborate instructions in writing. Contact with patients inbetween the appointments surmounts the respect and enhances the faith in treating dentist and prones them more to follow the instructions given by the dentist.

An attempt is made in this book to present the essential knowledge in simple language and style, that is easy to remember. Rarities are left for references and not to overload the reader and tax his memory.

Illustrations, figures, charts and photos are supplemented to facilitate the reader to clearly visualize and remember the facts when needed.

Treatment, a part of important aspect, is dealt especially, to help prescribe the drugs specifically and properly. Only mentioning the generic names does not help actually prescribe. The drugs are mentioned along with the doses and names of the company to facilitate the chemist to dispense promptly. Awareness of contraindications and side effects makes the prescriber more confident to continue or discontinue the drug. This aspect may be considered as an important exclusive in this book which one should keep at hand to use it when needed with due confidence.

Hope the readers are satisfied to the extent expected by the author.

Hari Vishnu Phophale

Contents

Introduction

The planning of this book starts from embryonic development covering the congenital anomalies of teeth, their applied anatomy, and physiology including the surrounding structures of buccal cavity. Then the pathological possible lesions, their investigations, interpretations of results and also preventive and therapeutic aspects. Association with systemic diseases is well illustrated.

It is essential to take required assistance of other specialists such as physician, hematologist, oncologist, surgeon, ENT specialist, plastic and orthopedic surgeons in treating the complicated dental problems.

Every individual complicated case is a book in itself and should be considered separately, precisely, thoroughly when the responsibility of active treatment is undertaken. The precision is an ideal and the top is always vacant. Still everyone should honestly opt for it.

The dimensions of dentistry are rapidly increasing and expanding globally. The public at large have become more and more conscious of the subspecialties and voluntarily approaching for their individual problems to them directly.

Following are the subspecialities commonly known (They will be ever increasing with the advancement of scientific research).

1. Prosthodontics
2. Endodontics
3. Orthodontics
4. Periodontics
5. Implants
6. Oral surgery
7. Oral radiology and medicine
8. Pedodontics.

These subspecialties are diagonally connected with systemic medicine and the reader will aptly appreciate and use it for better services to the dental patients.

Over the last few decades, progressive dentists have been active agents in the revolution of transforming the profession from being providers of " Need Dentistry " to " Want Dentistry." The main obstacles, for the dentist is to provide "Want dentistry" to their patients, are the limits and types of services covered by traditional dental plan, which may prove as barrier to the dentist to treat their patients which they really need. Better understanding will prevail to find out the possible mid-way acceptable to both.

The minimal knowledge of systemic medicine will expand the outlook of the practising clinician and will definitely help him in diagnosing and treating the patients promptly. When other specialists to whom the patient is referred it is imperative that the referring clinician must be in a position to understand the line of treatment suggested by the specialists. This will increase his own experience and knowledge.

Interpretations of investigation reports are also important factor on the basis of which the diagnosis is arrived. Moreover, the modern investigations are needed for any particular case also depend upon the basic knowledge, which is attempted to present in this textbook.

Introduction to the Systemic Medicine 1

PRINCIPLES OF MEDICINE

a. Medicine
b. Patient
c. Doctor
d. Medical ethics
e. Physician's approach to the patient
f. Physical examination
g. Probable diagnosis
h. Treatment
i. Incurable diseases
j. Preventive medicine and health for all.

MEDICINE

The word medicine means drugs and remedies. It has got many branches developed such as aviation medicine, and nuclear medicine, clinical, legal, forensic, ionic or nuclear, patent, preventive, proprietary medicine, psychosomatic medicine, socialized medicine, and medical public health, etc.

PATIENT

A patient is one who suffers from diseases and desires to undergo treatment and who looks towards the doctor with faith, hopes and expectations and likes to be heard and listened to sympathetically, attentively and always wishes to know about diagnosis prognosis, and expenses.

DOCTOR

A doctor is a qualified practitioner who treats the patient after obtaining history, and after physically examining him and he is supposed to be well-versed in the science and art of medicine. He is a compassionate, sympathetic as well as attentive listener and sober enough not to loose patience or temper.

MEDICAL ETHICS

The Hippocratic oath is taken with strict adherence to the high standard behavior with the patient and maintain secrecy as far as possible about his ailment and observe benevolence and sympathy and try to give relief and cure to the extent possible and avoid all avenues of malpractices and also safeguard the public interest.

PHYSICIAN'S APPROACH TO THE PATIENT

It starts with history taking, attentive hearing, skillfully putting leading questions when necessary and fully use the background of age, sex, education, geographic knowledge, and existing epidemics and frequency of disease, foreign travel, professional hazards, diet, habits and company he or she keeps

along with the required family history. Professor Dunlop used to say that 70 percent diagnosis possibility can be reached if satisfactory history is taken.

PHYSICAL EXAMINATION

Inspection

From head to foot, *purposeful*, i*ntelligent*, having insight and connection with his complaints. Patients to be seen sitting, bending, walking and lying down and for limb movements, coordination and tremors, chest measurements during inspiration and expiration and abdomen measurement at the umbilicus.

Palpation

Height, weight, pulse, respiration, temperature, vital capacity, if necessary femoral and popliteal pulse palpation.

Percussion

Required perfect silence and proper technique.

Auscultation

Over cardiac area, arteries, lungs, joints, eyeballs and aneurysmal swellings, abdomen and skull.

PROBABLE DIAGNOSIS

Note down probable diagnosis as No. 1, No. 2, and No. 3 investigate one by one through latest techniques of laboratory, X-rays, and other facilities available such as sonography, scanning, skin test, nuclear imaging, culture, biopsy, serological tests.

TREATMENT

Treatment depends on:

1. Radical.
2. Symptomatic.
3. General.
4. Preventive.
5. Isolation.
6. Quarantine.

INCURABLE DISEASES

If the patient is suffering from an incurable disease try to be tactful in communication with him in pieces with due intervals and impress aspects of positive variations and advise him about occupation, games, marriage, driving, travel and also explain to him about the necessary precautions he/she requires to take. Inform about the patients with same diseases who have improved by advanced; treatment and if possible; give their addresses so that the patient can communicate with such relieved patients.

When necessary refer to him various specialists so that he/she feels more and more satisfied and gets convinced about relief of ailment in due course of time and does not get a shock or depression but looks forward toward new therapeutic horizon with renewed hope and faith.

PREVENTIVE MEDICINE AND HEALTH FOR ALL

It is a Government public health ideal and will not be achieved unless 100 percent literacy come up and more than 30 percent of total budget of the country are spent carefully on public health requirements. The nationalization of health services in the UK is one of the constructive steps and is required to be followed by all the nations and strictly follow the international preventive rules for the diseases like AIDS, etc. **Not failure but low aim is a crime and where there is a will, there is always a way out of all the odds.**

Systematic Medicine: Modern Investigative Facilities 2

VARIOUS INVESTIGATIVE FACILITIES FOR DIAGNOSIS

The modern clinician is really very fortunate to have at his disposal a vast variety of clinical imaging modalities, both conventional and recent modern.

It may not be wise to take the dentist in this wilderness of technicalities; but at the same time, he should at least know their face acquaintance and develop a habit to read the reports written by the specialists and decide about the safety in handling the difficult dental cases, having associated medical problems.

Following is the list of investigations:

1. Conventional radiography.
2. X-ray contrast studies (barium, IVP).
3. CAT (Computerized axial tomograhy).
4. MRI (Magnetic resonance imaging).
5. MRA (Magnetic resonance angiography).
6. MRS (Magnetic resonance spectroscopy).
7. RI (Radionuclide imaging).
8. SPECT (Single photon emission computed tomography).
9. PET (Positron-emission tomography).
10. US (Ultrasonography).
11. 2D Echocardiography.
12. 2DE Doppler echocardiography studies.
13. The latest is radionuclide imaging with computerized report.
14. Radioactive tracer is given by mouth, inhalation, or IV injection followed by radiation detector, placed externally over body.

These imaging modalities are required to be used when absolutely indicated and cost-effective. Usually, simple and less expensive investigations are done first and then difficult and expensive ones, if found necessary and helpful and affordable.

ADVANCES IN DENTAL APPLIANCES

1. Laser.
2. Air abrasion (for end cutting device)
3. Radiovasography (RVG) (for diagnosis of caries).
4. Pulse oximetry (for determining pulpal vascular health).
5. Laser Doppler flowmetry (LDF) (for measuring the velocity of RBC in the capillaries).
6. Apex locator.

Body Metabolism 3

The sum total of physical and chemical processes going on in living body by which constructive activities are resulted, it is called anabolism; and when destructive processes are manifested, it is called catabolism. When it is measured in resting position, it is called basal metabolic rate being determined by the oxygen utilized.

FLUIDS AND ELECTROLYTES

Body fluids constitute 60 percent of body weight amounting to about 36 liters in a man of 60 kg wt.

Electrolytes are sodium, potassium, chlorides, bicarbonates, magnesium, phosphates, sulphates, calcium.

Regulatory Mechanism

Caloric intake and metabolic expenditure require to be regulated to maintain the internal health and the balance between intake and losses requires to be kept properly up to the normal.

External losses may be due to vomiting, diarrhea, blood loss, or due to succussion of gastrointestinal contents.

Replacement should be quantitative and qualitative without loss of time and with efficient technique. Losses exceeding 15 percent of body weight are usually incompatible with life.

Hydrogen Ion Concentration or pH

Blood pH is between 7.37 and 7.45. The blood is alkaline because of bicarbonates, phosphates and proteins. It becomes acidosis because of carbonic acid which body metabolism produces and it is eliminated by the body as CO_2 pressure in alveoli of the lungs and determine the component of carbonic acid concentration which is eliminated as CO_2 by the lungs.

Metabolic Acidosis

It occurs due to increase in the acid components or depression of bicarbonates. Production of large amounts of lactic acid in vigorous exercises is one of the common causes of acidosis, but other important causes are diabetic ketoacidosis and renal failure. The depressant of the carbonates occurs in diarrhea. Acidosis stimulates the respiratory center and the respiration becomes deep and rapid. The treatment is infusion of normal saline; and in severe cases, IV sodium bicarbonate.

Metabolic Alkalosis

It occurs due to loss of acids in vomiting of pyloric stenosis, chloride deficiency stimulates renal tubules to reabsorb the bicarbonates precipitating alkolosis. The diagnosis is only possible by estimating plasma bicarbonates. Clinically, apathy, personality changes,

delirium and tetany appear. The treatment is IV isotonic sodium chloride; and in severe cases, IV ammonium chloride.

Inborn Errors of Carbohydrate Metabolism

A group of rare disorders covering infancy to adolescence maybe in the back of mind to be referred to the medical specialist for necessary diagnosis, care and management.

ENDOCRINE METABOLIC DISORDERS

The components of internal system directly control the physical and mental development activities of human body and are under endocrine influence which requires to be kept in the mind while dealing with the patients in practice. The whole spectrum is due to either hypo- or hypersecretion of the group of endocrine glands; and the following basic information and conditions can never be overlooked by the clinician in practice:

1. Pituitary gland is the king of endocrine and master of orchestra and secretes TRH/LH/FSH–RH and GHR II.
2. Thyroid produces thyroxine (T_4) and triiodothyronine (T_3) hormones.
3. Parathyroid produces parathyroidal hormone.
4. Adrenals produce ACTH.
5. Diabetes is produced by absolute or relative deficiency of insulin by islets of Langerhans of pancreas.
6. Ovaries, the female sex hormone produces estrogen.
7. Testis, a male sex hormone produces testerone.

The clinical conditions produced by excess or deficient quantities of hormones are as under:

a. Pituitary—excess produces gigantism, acromegaly, diabetes insipidus.

   Deficiency produces dwarfism, infantilism, pan-hypopituitarism, called Simmond's disease produces pituitary cachexia.

b. Thyroid gland—excess produces thyrotoxicosis (Graves' disease).

   Deficiency produces hypothyroidism, myxoedema, and goiter.

c. Parathyroid—excess produces hyperparathyroidism.

   Deficiency produces tetany.

d. Adrenal glands—excess produces Cushing's syndrome.

   Deficiency produces Addison's disease.

e. Male sex hormone deficiency produces hypogonadism, cryptorchidism, infertility, and impotence and also Klinefelter's syndrome where there is a testicular atrophy and absence of secondary sex character with bilateral gynecomastia, and often mental retardation

f. Female sex disorders: They are as follows:

   Primary amenorrhea, Turner's syndrome, hermaphroditism, and menopause.

   Tumors of ovary usually unilateral cause pseudosexual precocity in girls showing early development of second sex character including the size of breast and start of early MC.

g. Diabetes mellitus—hyperglycemia is produced due to deficiency or diminished effectiveness of insulin secreted by islets of Langerhans' of pancreas.

   Its oropharyngeal manifestations require presumptive knowledge and attention on the basis of which investigations are done and the diagnosis is reached.

   Hypoglycemia and hyperinsulinism require immediate attention because it can be fatal. It occurs due to overdose of insulin given in treatment. The blood sugar below 50 mg per 100 cc generally is considered significant and calls for emergency treatment of glucose replacement, corticoids, and ACTH therapy. In case of tumor of pancreas, either benign or malignant producing excess of insulin requires surgical extraction.

Nutritional Factors in Health and Diseases

4

Infancy (Both to 6 Month) Late Infancy (6 Months to 1 Year)

Breastfeeding is superior to the bottle feeding due to economy, convenience, temperature, asepsis and automatic adjustments. It fulfills the nutritional needs and also provides emotional and psychological benefits. It manages the time intervals as well as use of breast to avoid overuse and to be regulated under the guidance of pediatrician.

Early Childhood (1 to 5 Years) Late Childhood (6 to 12 Years)

Artificial feeding is to be introduced gradually by soft and nourishing feeds looking into the tolerability of the system and taste and variety of foods including fruits, vegetables, soups, juices to be added conveniently.

Adolescence (12 to 18 Years)

Gradually increasing the quantity of nourishing food as described above and quantity depends upon activity, intervals, appetites schooling and games. The components of the food like carbohydrates, proteins and fats are required to be provided.

The dietic details are not appropriate to a clinical primer and may be sought in textbooks of nutrition, if needed.

Importance of Nutritional Problems

It is unfortunate that medical students and practising doctors do not appreciate the magnanimity of nutrition problems.

The overpopulation and shortage of food with rising costs result into undernutrition, subnutrition, malnutrition leading to starvation.

The clinical picture is underweight, cachexia, chronic infections such of tuberculosis, malabsorption, kwashiorkor and marasmus as well as nutritional dwarfism.

The art of treatment being the suitable food in a way to meet the tolerability of the patient having prolonged alimentary tract dysfunction, lower digestibility even sometimes causing nutritional diarrhea. **S**ome times whole blood as plasma transfusions are helpful.

Etiology of Nutritional Disorders

1. Quantitative deficiency causing subnutrition and starvation.
2. Qualitative deficiency causing (wrong food) malnutrition.
3. Overfeeding causing overweight, obesity.
4. Quantitative overfeedings of vitamins/iron causing hypervitaminosis and siderosis.

5. Excess of toxins in food depending on single foodstuff in that such as lathyrism (nutritional spastic paraplegia) due to neurotoxin BOAA.

Defective Intake of Food

1. Loss of appetite.
2. Persistent vomiting.
3. Food fads.
4. Prolonged IV injections.
5. Nutritional dependence such as old age, infancy and childhood.

CALORIC VALUE OF MAIN FOODSTUFF

1. Carbohydrates provide the main source of energy and is non-convertible from other nutrients with minimal daily requirement of 400 gm per day for an adult, but requirement is variable for hard physical work.
2. Fats have got high caloric value and requires 100 gm, per day, per adult.
3. The proteins provide 8 essential amino acids; methionine, lysine, trytophane, phenylalanine, leucine, isoleucine, thereonine, and valine. It is also proved that histidine and arginine are also needed for growth of infants. The daily requirement of proteins is 100 gm per day for an adult.

KNOWN NUTRITIONAL DISORDERS

1. *Kwashiorkor:* Due to prolonged breastfeeding practised in some African states, there is failure of growth marked by edema due to hypoproteinemia. There are skin changes in the heir growth and mental changes with GI disturbances, anemia, avitaminosis, complicated with infections such as TB.
2. *Nutritional marasmus:* It usually appears in infants below one year, associated with poverty, inadequate nutritional feeds and presence of chronic infection such as TB or GI tract dysfunction. There is retardation of growth and wasting of muscles. There are changes in skin, hair, apathy, mental retardation, avitaminosis, diarrhea and dehydration.
3. *Nutritional dwarfism:* Usually apparent and associated with a degree of mental retardation and presence of chronic infections such as TB.

VITAMINS AND MINERALS

The fat-soluble vitamins are A, D, E, and K.

The water-soluble vitamins are B complex, and vitamin C.

Minerals: Calcium, daily requirement is 500 to 700 mg.

Iron, daily requirement about 100 mg.

Iodine, present in sea food, vegetables, milk, and requirement is in traces.

Fluorides prevent dental caries and the chief source is drinking water. When it is in excess in the water, we call it epidemic fluorosis (point to be noted that it is deposited in the developing teeth and not in developed).

Sulphur, zinc, copper and chromium: Requirement is in traces.

VITAMIN DEFICIENCY SYNDROMES

Vitamin A deficiency causes nightblindness, xerophthalmia, keratomalacia, and follicular keratosis.

Vitamin D deficiency causes rickets in infants and children and osteomalacia in adults and osteoporosis in elderly women.

Vitamin C deficiency causes scurvy.

Vitamin B_1 deficiency causes beriberi and amblyopia.

Nicotinic acid deficiency (B-complex) causes pellagra which is common in maize eaters associated with dermatitis, diarrhea; and in late stages, dementia.

Riboflavin deficiency causes angular stomatitis, chelosis, and nasolabial seborrhea and scrotal dermatitis, magenta-colored tongue.

Vitamin B_{12} (Cobalamins). Normal requirement is 2 mcg per day, deficiency affects bone marrow and central nervous system causing neuropathy.

Folic acid deficiency causes megaloblastic anemia and atrophic changes in the GI tract.

OBESITY

It is one of the most common nutritional disorders in infants, children and adults causing increased complications and mortality. There is abnormal storage of fat in depots. They are more prone to develop diabetes, gallstones, gout, cardiovascular disorders and mechanical accidents.

The sheet anchor of treatment is continued by strict dieting under the guidance of nutritional expert along with increased activities, outdoor games, swimming, exercises, yogic exercises, jogging and running.

DIETS

The diet sheets that follow have been constructed to illustrate the quantitative and qualitative aspects of diets required for the treatment of obesity and diabetes mellitus. The quantities given in a standard diet sheet will obviously require some modifications in relation to the size, age, sex and occupation of the patient. In the dietetic treatment of most diseases it is unnecessary to weigh accurately the amounts of the different foods eaten. Under these circumstances, sufficient accuracy will be secured by the use of household measures as illustrated in Diet 1 and by the terms 'small', 'medium' or 'large' helping for meat, fish or chicken. A small helping weighs approximately 1 to 2 oz (30-60 g), a medium helping 2 to 3 oz (60-90 g) and a large helping 4 oz (120 g) or more.

The qualitative content of the diet, i.e. the actual food consumed will vary widely. The examples detailed here are suitable for persons whose food habits are those of the Western world. If they are to be effective therapeutically, diet prescriptions must be carefully adapted to take account of national, cultural and local eating habits and affordability.

The subcommittee on Metrication of the British National Committee for Nutritional Sciences of the Royal Society recommended in 1972 that kilojoules should be used in place of kilocalories. A kcal = 4.184 kJ, so that the caloric conversion factors (heat of combustion; available energy) for carbohydrate, fat, protein and alcohol are 16, 37, 17 and 29 kJ/g, respectively. Useful practical approximations are:

950 kcal = 4,000 kJ
1,450 kcal= 6,000 kJ
2,850 kcal= 12,000 kJ

DIET 1: LOW CALORIE (ENERGY) DIET SUITABLE FOR ADULTS WITH OBESITY (WITH OR WITHOUT DIABETES)

Approximately protein 60 g, carbohydrate 100 g, fat 40 g, energy 1,000 kcal (4,184 kJ).

Early morning cup of tea, milk from allowance,* if desired.

Breakfast

One egg or 1 oz (30 g) grilled lean bacon (2 rashers) or cold ham or breakfast fish. ~ oz (20 g) white or brown bread, or exchange, with butter from allowance. Tea, with milk from allowance.

Mid-morning: Tea or coffee, with milk from allowance, or 'free' drink from Group A3.

½ oz (15 g) butter or margarine. (Cut a ½ lb packet into 16 equal portions, each portion = ½ oz).

Exchanges for 2/3 oz (20 g) bread (1/2 slice from a large cut loaf):

2 cream crackers. (1½ of any crisp bread) 1 potato (the size of a hen's egg).

2 water biscuits: 1 portion of fruit (from list below), 1 triangular oatcake.

*Allowance for day, ½ pint milk (300 ml]) with the cream poured off the top (The use of whole milk will increase the caloric content of this diet to approximately 1,100 kcal).

Exchanges for 1 1/3 oz (40 g) bread (1 slice from a large cut loaf):

4 cream crackers. (3 of any crisp bread) 2 potatoes (size of hen's egg).

4 water biscuits: 2 portions of fruit (from list below), 2 triangular oatcakes.

Fruit to be taken as part of diet at lunch or evening meal:

1 piece of fresh fruit, i.e. apple, pear, orange, peach or medium-sized helping of fruit stewed without sugar.

DIETARY EXCHANGES FOR DIABETICS
3 FAT EXCHANGES

Each exchange approximately 12 g fat and almost no carbohydrate or protein. Caloric value is approximately 110.

	Amount		*Remarks*
	oz	*G*	
Butter, margarine, lard, dripping, cooking	0.5	14	
Fat, olive oil, vegetable oil.			
Cream (single)	2	60	
Cream (double)	1	30	
Salad cream or mayonnaise	1	30	

Introductions for Diabetics—Continued
Group A: Foods which May be Taken in any Quantity

Tea, coffee (Milk from allowance, no sugar), Oxo, Bovril, Marmite, etc.

Tomato juice, lemon juice.

Diabetic fruit squashes.

Saccharine preparations.

Clear soup.

Herbs, seasonings and spices. Brussels, sprouts, cabbage, carrots, cauliflower, celery, cucumber, French beans, leeks, lettuce, mushrooms, mustard or cress, onions, spring onions, runner beans, Swedes spinach, tomatoes, turnips, watercress.

Cranberries, grapefruit, gooseberries, lemon, melon, loganberries, redcurrants, rhubarb.

Group B

To be taken in strict moderation in consultation with the doctor.

Spirits, dry wines, dry sherries.

Group C

Foods not allowed.

Sugar, glucose, sweets, chocolate, honey, syrup, treacle, jam, marmalade, cakes, biscuits (except those specified), pies, fruit tinned in syrup, fruit squash, lemonade or similar aerated drinks.

Note—Most "diabetic' foodstuffs on sale at chemists and health food stores do contain some carbohydrate and must, therefore, not be taken without consulting your doctor or dietitian.

DIET 1: AN EXAMPLE OF THE DISTRIBUTION OF EXCHANGES FOR A DIET RESTRICTED IN CARBOHYDRATE

Suitable for Adults with Diabetes Mellitus

Approximately protein 80 g, carbohydrate 210 g, fat 70 g, energy 1800 kcal (7560 kJ)

Breakfast	1 protein exchange.
	4 carbohydrate exchanges.
	Butter and milk from allowance.
	Tea or coffee (no sugar)
Mid-morning.	2 carbohydrate exchanges.
	Butter and milk from allowance.
	Tea or coffee (no sugar)
Mid-day meal	Clear soup if desired.
	2 protein exchanges.
	4 carbohydrate exchanges.
	Vegetables if desired (group A.)
	Butter and milk from allowance.
Mid-afternoon	2 carbohydrate exchanges.
	Butter and milk from allowance.
	Tea (with no sugar)
Evening meal	2 protein exchanges.
	5 carbohydrate exchanges.
	Vegetables if desired (group A)
	Tea or coffee (with no sugar)

Before bed	2 carbohydrate exchanges Reminder of butter and milk from allowances.

A list of suitable exchanges is given as below under diet 2, 3, 4.

Allowance for day ; ½ pint (400 ml) whole milk
1 oz (30 g) butter or margarine.

DIET 2: AN EXAMPLE OF A MENU RESTRICTED IN CARBOHYDRATES, BASED ON DISTRIBUTION OF EXCHANGES

Suitable for Adults with Diabetes Mellitus

Approximately protein 80 g, carbohydrate 210 g, fat 70 g, energy 1,800 kcal (7560 kJ)

Breakfast	4 oz (120 g) porridge with milk from allowance or 1 egg + 2 oz (60 g) bread with butter from allowance. Tea or coffee with milk from allowance.
Mid-morning	1 oz (30 g) rich tea biscuits. Tea or coffee with milk from allowance.
Mid-day meal	Clear soup with shredded vegetables. 2 oz (60 g) lean meat. 4 oz (120 g) boiled potatoes. 2 oz (60 g) tinned pies. Salad or other unrestricted vegetables from group A if desired. 4 oz (120 g) orange (peeled weight). Tea or coffee with milk from allowance.
Mid-afternoon	1 oz (30 g) digestive biscuits. Tea or coffee with milk from allowance.
Evening meal	3 oz (90 g) fish. Tomato or other unrestricted vegetables from group A if desired. 2 oz (60 g) bread with butter from allowance. 3 oz (90 g) banana (weight with skin) 2 oz (60 g) ice cream. Tea or coffee with milk from allowance.
Before bed	Remainder of milk from allowance and ½ oz ovaltine. 2/3 (20 g) bread, toasted with butter from allowance.

Allowance for day; 2/3 pint milk (400 ml), 1 oz (320 g) butter or margarine.

DIET 3: UNMEASURED DIET

Suitable for Adults with Diabetes Mellitus

Patients who are unable to weigh their diet or for whom this is unnecessary, are given a list of foods which are grouped into three categories.

a. *Foods to be avoided altogether:*
   1. Sugar, glucose, jam, marmalade, honey, syrup, treacle, tinned fruits, sweets, chocolate, lemonade, glucose drinks, proprietary milk preparations and similar foods which are sweetened with sugar.
   2. Cakes, sweet biscuits, chocolate biscuits, pies, puddings, thick sauces.
   3. Alcoholic drinks unless permission has been given by the doctor.

b. *Foods to be eaten in moderation only*:
   1. Breads of all kinds (including so-called 'sliming' and 'starch-reduced' breads, brown or white, plain or toasted).
   2. Rolls, scones, biscuits and crisp breads.
   3. Potatoes, peas and baked beans.
   4. Breakfast cereals and porridge.
   5. All fresh or dried fruit.
   6. Macaroni, spaghetti, custard and foods with much flour.
   7. Thick soups.
   8. Diabetic foods.
   9. Milk.

c. *Foods to be eaten as desired*:
   1. All meats, fish, eggs.
   2. Cheese.
   3. Clear soups or meat extracts, tomato or lemon juice.
   4. Tea or coffee,
   5. Cabbage, Brussels sprouts, broccoli, cauliflower, spinach, turnip, runner or French beans, onions, leeks or mushrooms. Lettuce, cucumber, tomatoes, spring onions, radishes, mustard and cress, asparagus, parsley, rhubarb.
   6. Herbs, spices, salt, pepper and mustard.
   7. Saccharine preparations for sweating.

For overweight diabetics, butter, margarine, fatty and dried foods must be restricted.

DIET 4

Low in saturated fats and cholesterol with increased amounts of polyunsaturated fat.

Foods to be avoided: Butter and hydrogenated margarines. Use polyunsaturated margarine, e.g. "flora."

- Lard, suet, shortenings and cakes, biscuits and pastries made with these.
- Fatty meat and visible fat on meat. Meat pies, sausages and luncheon meals.
- Whole milk and cream.
- Chocolate, icecream (except water ices). Cheese, except low fat cottage cheese.
- Coconut, coconut oil and coffee mate.
- Eggs—no more than 1 to 2 egg yolks per week, including that used in cooking.
- Organ meats—liver, kidneys and brain.
- Shelfish and fish roes, fried foods unless fried in polyunsaturated oil (like sunflower or corn oil).
- Potato crisp and most nuts.
- Gravy unless made with polyunsaturated oil, and tinned soups.
- Salad dressing unless made with polyunsaturated oil.
- Further reading about dietetics and additional diets:

Davidson, Sir Stanley, Passmore, R, Brock JF, Trustwell AS. (19750 Human Nutrition and Dietetics (6 edn). Edinburgh: Churchill Livingstone

For additional diet sheets.

- Starch-reduced products, "diabetic" foodstuffs.
- Sausages.
- All fried foods.
- All foods must be served without thickened gravies and sauces. All foods may be baked, grilled, boiled or steamed, but not fried.

DIABETIC DIETS: METHODS OF CONSTRUCTING A DIET RESTRICTED IN CARBOHYDRATE CONTAINING APPROXIMATELY 1800 KCAL (7560 kJ) WITH 210 G CARBOHYDRATE, 80 G PROTEIN AND 70 G FAT

Suitable for Adults with Diabetes Mellitus

Each carbohydrate exchange contains approximately 10 g carbohydrate, 1.5 g protein and 0.3 g fat. Caloric value is about 50 (equivalent to 2/3 oz bread). Use is made of the at water caloric conversion factors of 4, 4 and 9 kcal/g for carbohydrate, protein and fat, respectively.

Each protein exchange contains approximately 7 g protein and 5 g fat. Caloric value is about 70 (equivalent to 1 oz meat)

Each fat exchange contains approximately 12 g fat and almost no carbohydrate or protein. Caloric value is about 110 (equivalent to ½ oz butter). One pint of milk contains approximately 30 g carbohydrate, 18 g protein and 24 g fat. Caloric value is about 410.

In practice, for quick calculation of a diabetic diet, it is usually only necessary to work in terms of grams of carbohydrate and total calories. For this purpose, the caloric value of the exchanges can be rounded to the nearest 10, i.e.

Carbohydrate exchange = 50 kcal.
Protein exchange = 70 kcal.
Fat exchange = 110 kcal.
One pint of milk = 410 kcal.

Thus, a diet prescription for 210 g carbohydrate, 1,800 kcal would be calculated as follows:

1. The daily intake of carbohydrate (210 g) represents 21 carbohydrate exchanges.
2. The daily allowance of milk is decided either on the basis of the patient's food habits or on his special requirements; in this example, it is ½ pint (400 ml) which contains 2 carbohydrate exchanges, leaving 19 for distribution throughout the day.
3. The daily allowance of protein is then decided. Five protein exchanges will provide 350 kcal.
4. The calories allocated so far amount to 1,580; a further 220 kcal are needed to bring the total up to 1,800 kcal. This must be provided by fat. As one fat exchange provides 110 kcal, two are needed.

EXCHANGES

	Grams of carbohydrate	*kcal*
2/3 pint milk (400 ml) = 3 carbohydrate exchanges	20	280
19 carbohydrate exchanges	190	950
5 protein exchanges	—	350
Total	210	1,580
2 fat exchanges	—	220
Grand Total	210	1,800

5. Finally, the exchange (21 carbohydrate, 5 protein and 2 fat) are distributed throughout the day according to the eating habits and daily routine of the patient. Diet 2 shows a specimen menu and a list of sample exchanges is shown on pages 13 and 14).

Mid-day meal	Clear soup, tomato juice or grapefruit, if desired. Small helping 2 oz (60 g) lean meat, ham, poultry, game or offal or 3 oz (90 g) white fish (steamed, baked or grilled) or 1 egg or 1 oz (30 g) cheese. Salad or vegetables from Group A1 as desired. 1½ oz (40 g) bread (white or brown) or exchange, with butter from allowance if desired. 1 portion of fruit from list below. Tea or coffee, with milk from allowance.
Mid-afternoon	½ oz (20 g) white or brown bread, or exchange, with butter from allowance.
Evening meal	Clear soup, meat or yeast extracts, tomato juice or grapefruit, if desired. Small helping 2 oz (60 g) lean meat, ham, poultry, game or foul or 3 oz (90 g) white fish (steamed, baked or grilled) or 1 egg or 1 oz cheese. Salad or vegetables from Group A1 as desired. 1 ½ oz (40 g) bread (white or brown) or exchange with butter from allowance, if desired. One portion of the fruit from list below. Tea or coffee, with milk from allowance.
Before bed	Tea or coffee, with milk from allowance.

GROUP A: FOODS WHICH MAY BE TAKEN IF DESIRED BUT IN NOMINAL QUANTITY AND OCCASIONALLY

- Sugar (brown or white), glucose, sorbitol.
- Sweets, toffees, chocolates, cornflour, custard powder.
- Jam, marmalade, lemon curd, syrup, honey, treacle.

- Tinned, frozen or bottled fruits.
- Dried fruits, e.g. dates, figs, prunes, apricots, sultanas, currants, raisins, bananas, grapes.
- Cakes, buns, pastries, pies, steamed or milk puddings.
- Sweet or chocolate biscuits, scones.
- Cereals, e.g. rice, sago, macaroni, barley, spaghetti, etc.
- Breakfast cereal, porridge.
- Cocoa, ovaltine, horlicks, etc.
- Icecream, fresh or synthetic cream, table jelly.
- Evaporated or condensed milk.
- Peas, parsnips, beetroot, sweetcorns, Haricot beans, butter beans, broad beans, lentils, nuts.
- Salad cream, salad dressing, mayonnaise.
- Tomato and brown sauce of any thickened sauce.
- Sweet pickles and chutney.
- Thickened soups, gravis Bisto.
- Alcoholic drinks, e.g. beer, wine, sherry spirits.
- Sweetened fruit juices, fruit squash, cocoa, cola and other sweet fizzy, 'soft drinks.'
- Lemonades, Lucozade, Ribena.

DIETARY EXCHANGES FOR DIABETICS CARBOHYDRATE EXCHANGES

Each item on this list = 1 carbohydrate exchange (10 g CHO)
Caloric value is approximately 50.

	Amount		*Remarks*
	oz	*g*	
Bread, Biscuits and Scones:			
Bread (white or btown)	2/3	20	½ slice off a large, cut loaf
Bread (toasted)	2/3	15	——
Scones, rolls and oatcakes	2/3	20	——
Cream crackers, crisp breads			
Digestive biscuits	½	15	——
Rich tea biscuits			
Water biscuits			
Pastry (unsweetened)	2/3	20	——
Cereals			
Porridge	4	120	Cooked
Breakfast cereals			
Arrowroot, barley, cornflower,			
Custard powder, oatmeal			
Flour, macaroni, rice, sago,	½	15	All in dry state
Semolina, spaghetti, tapioca			
Rice, macaroni, spaghetti	1½	45	Boiled
Spaghetti in tomato sauce	3	90	Tinned
Miscellaneous			
Cocoa	1	30	
Ovaltine, Horlicks, etc.	½	15	
Creamed (tinned or packet) soup	4	120	Small tear cup
Icecream (Lyons or Walls)	2	60	1 small plain
Packet Jelly	2	60	Made up
Milk fresh	7	210	½ pint
Milk evaporated	3	90	——
Milk condensed (sweetened)	½	20	——
Alelager and draught beer	1 pint	600	——
Stout (Guinness)	½ pint	300	——

Contd...

Contd...

	Amount		Remarks
	oz	*g*	
Vegetables			
Potatoes (raw or boiled)	2	60	——
Potatoes (roasted or chipped)	1	30	——
Potato crisps	2/3	20	——
Baked beans			
Butter beans			
Haricot beans	2	60	——
Sweet corn			
Tinned peas			
Fresh or frozen peas			
Beetroot	4	120	——
Parsnips	3	90	——

CARBOHYDRATE EXCHANGES—CONTINUED

Each item = 1 carbohydrate exchange (10 g CHO)
Caloric value is approximately 50

	Raw		*Stewed (without sugar)*	
	oz	*g*	*oz*	*g*
Dried fruits:				
Apricots	2/3	20	2	60
Figs	2/3	20	2	60
Prunes	1	30	2	60
Dates				
Currants	½	15	—	—
Sultanas				
Raisins				
Fresh fruits				
Apples (with skin)	4	120	5	150
Bananas (with skin)	3	90	—	—
Black currants	5	150	7	210
Blackberries (brambles)	6	180	7	210
Cherries	3	90	4	120
Damsons	4	120	6	180
Grapes	2	60	—	—
Oranges and tangerines:				
With skin	6	180	—	—
Without skin	4	120	—	—
Orange juice	4	120	—	—
Peaches	4	120	—	—
Pears	5	150	5	150
Pineapple (fresh)	3	90	—	—
Plums	4	120	7	210
Raspberries	6	180	7	210
Strawberries	6	180	7	210

PROTEIN EXCHANGES

Each item on this list = 1 protein exchange.
Calorie value is approximately 70

	Amount		*Remarks*
	Oz	*g*	
Meat, poultry, game and offals	1	30	Cooked weight
Corned beef, corned mutton, Tinned meat.	1	30	—-
Egg (1)	1½	45	—-
Cheese	2	60	—-
Fish—white, smoked cured, oily Shell or tinned and ripe	1½	45	Cooked weight
Sausages (include 1 carbohydrate exchange)	2	60	Cooked weight
Gravies should not contain cornflower or flour. Avoid frying as much as possible.			

Note: The food fads vary from state to state in the subcontinent of India; and for practicing dentists, it is advisable to refer the patient to Local Nutrition specialist giving the memo of total calories to be converted into local agreeable food varieties desirable to patient's habits after due discussion with the patient and his affordability of cost.

It is necessary for the clinician to go through the prescribed diet chart by the diatician so that he can omit or suggest alternate item if it contradicts his during treatment to the patients or stains the teeth during consumption. Generaly avoid fried, spicy, hard or sticy foods, which are too cold or too hot or sour. In due course of time the dental diatician speciality may develops.

Infection, Immunity and Epidemiology 5

NATURE OF THE MICROORGANISMS

Saprophytes are the living organisms on soil, water, plants, etc. They generally do not produce diseases in man but exceptionally may produce toxins and can spoil the food-stuff and cause food poisoning in patient with *Clostridium botulinum*. Saprophytes such as *Pseudomonas* may be opportunitist pathogens invading the tissue when resistance of the host is low. Similarly, commensal flora of the body can become opportunist pathogen such as *Candida* leading to thrush infection.

Microbes and parasites remaining in close association with host are highly adaptable to local conditions as well. Such commensals can turn into pathogens finishing their quasant role on opportune moment. Microorganisms grow very rapidly by binary fission and increase in millions and are also virulent that help them to overcome the host's defense and thus the pathogenesis starts.

SOURCE OF INFECTION

Autogenous: When the source is the patient himself.
Exogenous: When the source is another person who is a patient or carrier.
Carriers: Healthy persons are the source and they carry infection without suffering.
Other some animals: Cows, goats, birds, rats, dogs, rodents,
Environment: Soil, dust, water, airborne, droplet, food which is contaminated.
Other sources: Mosquitoes, hospital infection, milk, fomites, insects, flies, sandfly, fleas, ticks, lice, tics, or surgical instruments, wounds, injection needles, blood transfusion.

INCUBATION PERIOD

Microbes invade tissues and take some time to produce symptoms and this period is called incubation period, e.g. diphtheria about three days, measles 10 days, viral hepatitis type A about 2 to 6 weeks and hepatitis type B about 2 to 6 months, and leprosy about 3 to 33 years.

DEFENSE OF THE HOST

In the first stage of infection, the microbes invade the tissues. They have to confront tissue's mucus which mechanically limits their progress, and other fluids and enzymes overcome and kill the infection by antibodies. But it is not the case always if the infection is massive, repeated and virulent, the similar defenses come into dynamic action. If the infection is carried through lymphatic to the glands, the reticuloendothelium tissue kills those microorganisms. Some of the infections

enter the bloodstream, which is supposed to be the best medium for the organisms to grow and multiply. The infection resistance is the susceptibility and sensitivity that play an important part in the end results. However, immunity can save from the infection. Immunity can be natural or even acquired from mother to child or by injection of vaccines like smallpox, measles, typhoid, cholera and triple vaccine.

When the infection reaches deeper tissues, the defense mechanisms, "humeral" and "mechanical" are immediately called for. The defense mechanisms kill the microorganisms by endothelial cells and macrophages. By humeral defense antibodies are formed and by mechanical fibrin barriers try to localize and round up the infection.

GENERAL MANIFESTATIONS OF THE INFECTION

1. Fever.
2. Rigors.
3. Local symptoms depending on the site of the infection.

All these accelerate the host-defense mechanism to counter-attack the bacterial infection.

Pyrexia of Unknown Origin (PUO)

It is called so when diagnosis is difficult even after getting the routine laboratory tests, etc.

These are a group of diseases when the prolonged fever continues. Autoimmune disorders such as disseminated lupus erythematosis, polyarteritis nodosa, rheumatoid arthritis etc.

Malignancy such as cancer or sarcoma of lungs, stomach, kidney, etc. with or without metastasis.

Chronic infections such as TB, infective endocarditis, brucellosis, pelvic/subdiaphragmatic infection.

Hypersensitivity to drugs such as barbiturates, streptomycin.

Most of the diseases are diagnosed through various advanced investigative methods and biopsies. However, in some cases, when diagnosis is still not clear, one has to follow the procedure as below:

1. Re-take the history, such as trip abroad may have been missed.
2. New signs might have appeared requires careful reassessment.
3. Repeat laboratory test, especially urine, and multiple types of tests.
4. Study temperature chart from beginning.
5. Reassess all investigations and repeat the investigations such as X-rays, etc. and see whether the methods of investigations are correct.
6. Lastly, therapeutic antibiotic trial may be taken as a last resort.

ART OF TREATMENT INCLUDING IMMUNIZATION

The art of treatment as mentioned above depends upon symptomatic radical general treatment in which rest, diet and other facilities such as back rest, etc. and physiotherapeutic exercises on bed, fomentation, electrotherapy, etc.

Immunization following charts of immunization schedule usually followed in all the institutions supervised by the Local Municipal Corporations' health departments.

The various subspecialties of systemic medicine are developing by force of circumstances and that are as follows, just for information:

1. Critical care medicine.
2. High altitude medicine.
3. Submarine medicine.
4. Anesthesia medicine.
5. Pregnancy medicine.
6. Geriatric medicine.
7. Pediatric medicine.
8. Genetic engineering.
9. Ophthalmic medicine.
10. Yoga as medicine.

11. Sports medicine.
12. Life insurance medicine.
13. Clinical pharmacology—reactions and interactions of the drugs.
14. Aviation medicine.
15. Nuclear medicine.
16. Legal forensic medicine.
17. Psychosomatic medicine.
18. Social medicine.
19. Public health department.
20. Dietitian's role in medical treatment.

All these subdivisions appear as specialty branches and are being separated for the practical use of the patient. A point to be kept in the back of mind is that during the treatment, if the problem comes within the range of these subspecialities, then there should be no hesitation to take their assistance and refer the patients to them specifically for their guidance. So that, the patient is also mentally satisfied to get his doubt clarified through the subspecialist and also take the necessary guidance, which may not be within the limitations of this book. We have not included psychiatry in sub-specialty, because it is a fully-grown specialty and is discussed with neurology.

Diseases due to Infection

Diseases due to infection are the most common cause of ill health throughout the world. Organisms involved include bacteria, mycoplasmas, rickettsiae, viruses, protozoa, metazoa and fungi. The term infestation is now limited to ectoparasites, usually arthropods such as lice and fleas, which remain on the surface of the body but may transmit a systemic infection. Protozoal infections such as malaria, amebic dysentery, sleeping sickness and leishmaniasis and helminthiasis (worms) are of great importance in the tropics. Fungi causing ringworm and thrush occur all over the world; but systemic infections with other fungi, such as coccidiosis, histoplasmosis and the blastomycoses, are rare except in certain geographical locations.

The range of diseases caused by bacteria is large; streptococci and staphylococci are widespread and produce similar diseases throughout the world. Others such as the cholera vibrio and plague bacillus are locally endemic but may produce epidemics from time-to-time. Some bacterial infections may be acute such as diphtheria and tetanus, others chronic such as tuberculosis, syphilis and leprosy.

Organisms smaller than true bacteria, the rickettsiae which cause typhus fevers, the mycoplasmas of a typical pneumonia and *Chlamydia (bedsoniae)* of psittacosis, lymphogranuloma and trachoma are now recognized to be widespread and are susceptible to chemotherapy. The most bacterial, protozoal and fungal infections can be successfully treated with antibiotics and chemotherapeutic agents provided that the appropriate drug is prescribed early in the disease. This emphasizes the need for rapid and accurate diagnosis supplemented wherever necessary by specific sensitivity tests to indicate the most effective therapeutic agent (Tables 5.1 to 5.7).

Table 5.1: Antimicrobial spectra of chemotherapeutic agents

	Penicillin	Strepto-and Dihydros-treptomycin	Tetracylines	Chloram-phenicol	Erythro-mycin	Neo-mycin	Poly-myxin	Baci-tracin	Sulfona-mides	Nitro-furantoin (Furad-amtin®)
					CAUTION See below*					
Actinomyces sp.	+++C	++	++	+++C		+++	+C		++C	++
A.aerogenes										
Anthrax abcillus	++C	++	++	++					+C	
Brucella sp.			++C	++C	+C			+		+C
Cholera vibrios			+	+	+					+
Clostridia group	++C, at		++C, at	++C, at		+++			+c, at	
C. diphtheriae	+++C, at		++C, at	++C, at						
Donovan body		+	++	++						
Ery. rhusiopathiae	+++	+	+							
Esch. coli		++	++	+++		+++	+		++	++U
Gonococci	+++	+	+++	+++	+++				++	
H. ducreyi		+	+++	++			+	++		
H. influenzae		++C	++C	+++C			+++	+++	++C, at	
H. pertussis		+	++	++			+		+C, at	
Klebsiella sp.		+++	++	+++		+++	+++		+	
Leptospira	+	+++	+	+						
Lymphopathia venereum virus	++		+++	+++					+	
Meningococci	++		++	++					+++	
Myco. tuberculosis		+++C+								
P. tularensis		+++	+++	+++		++				
P. pestis		+++C	+++C	+++C					+C	
Pneumococci	+++	+++	+++	+++			+++	+		
Prim. atypical pneumonia virus			++	++	++					
P. vulgaris		+++	+U	+U		+++		+C, U	+++U	
Ps. aeruginosa		+	+U	+U		++	++		+++U	
Psittacosis virus		++	+++	+++				+		
Rickettsiaes				+++	+++			+++	+++	
S. typhosa			+	+++			++		+	
Shigella sp.		++	++	++			++		+++	
Spirochetes										
B. recurrentis	++		+++	++						
Vincent's bacillus	++									
T. pallidum	+++		++	++						
Spirillum minus		++		+++	+++					
Staphylococci	++	+	++	+++	+++	+++		+++		++U
Streptobacillus moniliformis	++									
Str. pyogenes (beta-hemolytic)	+++	+	++	++	+++	+++		+++		
Str. viridans (alpha-hemolytic)	+++	+	++	++	+++	+++		+++		
Str. faecalis	++C	++C	+C	++C	++C	+++		+++		

* These agents are nephrotoxic when used systemically and should be so used in hospitalized patients only.
† Combined therapy with streptomycin and dihydrostreptomycin and/or isoniazid (INH) and para-aminosalicylic acid (PAS). Agents of typhus, Rocky Mountain spotted fever, Q fever, and scrub typhus.
+++ Very effective. ++ Moderately effective. + Slightly effective.
C Use only in combination with another drug at antitoxin or antiserum. U For urinary tract infection only

Table 5.2: Currently available antimicrobial drugs with mode of action and mechanism of resistance

	Class of antimicrobial	*Mode of action*	*Mechanism of resistance*
1.	Beta lactam antibiotics		
	A. Penicillins (PCNs)	Bactericidal by inhibition of cell wall synthesis by inhibition of cross linking reaction	Inactivation by betalactamase
	B. Cephalosporins		Mutation in penicillin binding
	C. Monobactam		
	D. Amdinocillin (mecillinam)		
	E. Imipenem		Impermeability
	F. Beta lactam molecules Clavulanic acid Sulbactam	'Suicide inhibitors' of beta lactamase	
2.	Macrolides Erythromycin Clindamycin	**Bacteriostatic** by reversibly inhibiting ribosomal protein synthesis by binding to 50s fraction	Decreased ribosomal binding Impermeability
3.	Vancomycin	**Bactericidal** by inhibition of cell wall synthesis	Unidentified mechanism
4.	Tetracyclines	**Bacteriostatic by reversible** inhibition of ribosomal protein synthesis	Impermeability due to defective transport
5.	Chloramphenicol	**Bacteriostatic** by reversible inhibition of ribosomal protein synthesis at peptidyl transferase step	Acetylation by R-factor mediated enzyme
6.	Aminoglycosides Gentamicin Kanamycin Streptomycin	Bacteriostatic by inhibition of protein synthesis at initiation step	R-factor mediated enzymatic modification by acetylation, adenylylation, phosphorylation
7.	Polymyxins Colistin Polymyxin B	Damage to cell membrane	Impemeability
8.	Sulphonamides	**Bacteriostatic by interference with folic acid**	Mutation in enzymes of folic acid synthesis
9.	Trimethoprim	**Slow bactericidal** effect by inhibition of dihydrofolate reductase	Mutation in dihydrofolate reductase alternate pathway
10.	Quinolones Nalidixic acid Fluoroquinolones Norfloxacin Ciprofloxacin	**Inhibit DNA gyrase**	Unidentified mechanism; not mechanism; not affected by plasmid-mediated resistance unlike beta lactam and aminoglycosides

Contd...

Contd...

	Class of antimicrobial	*Mode of action*	*Mechanism of resistance*
11.	Metronidazole	Unidentified mechanism of action	Undelined resistance
12.	Pentamidine isethionate	Unknown mechanism	
13.	Isoniazid	**Bactericidal for *M. tuberculosis*** by inhibition of synthesis of mycolic acid	Mutation in mycolic acid synthesizing enzyme
14.	Rifampicin	**Bactericidal** by inhibition of DNA-dependent RNA polymerase	
15.	Pyrazinamide	**Bactericidal for intracellular mycobacteria**	
16.	Ethambutol	Undefined mechanism of action	Undefined resistance
17.	Cycloserine	**Bactericidal** by inhibition of cell wall synthesis	Unidentified resistance
18.	Amphotericin B	Interaction with ergosterol to damage cell membrane	Unidentified resistance
19.	Flucytosine	Inhibition of RNA synthesis	Impermea
20.	Imidazoles Ketoconazole Miconazole	Inhibition of synthesis of ergosterol	Unidentified resistance

Table 5.3: Antimicrobial selection based on organisms

Organism	*Drug of choice*	*Alternative drug*
Gram-positive cocci	Penicillin V	Erythromycin
Staphylococcus aureus	Penicillin G	Cephalosporin
Nonbeta lactamase producing	Methicillin	Vancomycin
Beta lactamase producing	Diclozacillin	Cephalosoprin
Methicillin-resistant	Vancomycin	
Streptococcus pyogenes		
Group A, C, G	Penicillin G or V	Erythromycin
Group B	Penicillin G or ampicillin	Cephalosporin
Streptococcus viridans	Penicillin G plus	Cephalosporin plus aminoglycoside
Streptococcus, anaerobic	Penicillin G	Erythromycin
Enterococcus	Ampicillin or amoxycillin	
Pneumococcus	Penicillin G or V	Cephalosporin, erythromycin, chloramphenicol (meningitis)
Gram-negative cocci		
Neisseria menngitides	Penicillin G	Ampicillin or amoxycillin chloramphenicol
Prophylaxis (meningitis)	Rifampicin	Micocycline
Neisseria gonorrhoeae	Penicillin G	Tetracycline spectinomycin ampicillin or amoxycillin
Extragenital	Penicillin G	Tetracycline

Contd...

Contd...

Organism	*Drug of choice*	*Alternative drug*
Gram-positive bacilli		
Bacillium anthracis	Penicillin G	Erythromycin, tetracycline
Listeria monocytogenes	Ampicllin, penicillin G	Penicillin G plus aminoglycoside
Clostridium tetani	Penicillin G	Tetracycline, erythromycin
Clostodium perfringens	Penicillin G	Chloramphenicol, tetracycline, cephalosporin
Corynebacterium diphtheriae	Penicillin G	Erythromycin
Shigella	Cotrimoxazole	Cephalosporin, ampicillin
Haemophilus influenzae (meningitis)	Chloramphenicol	Ampicillin or amoxycillin
Acinelbactin	Aminoglycoside	Carbenicillin, ticarcillin
Bordetella pertussis	Erythromycin	Cotrimoxazole
Brucella	Tetracycline	Cotrimoxazole, chloramphenicol
Treponema pallida	Penicillin G	Tetracycline
Leptospira	Penicillin G	Tetracycline
Chlamydiae	Erythromycin	Tetracycline
Mycoplasma	Erythromycin	Tetracycline
Legionella pneumoniae	Erythromycin	Tetracycline, rifampicin
Gram-negative bacilli		
Escherichia coli	Aminoglycoside	Ampicillin or amoxycillin, carbenicillin or ticarcillin, cephalosporin, cotrimoxazole
Klebsiella pneumoniae	Aminoglycoside	Cephalosporin, mezlocillin or piperacillin, contrimoxazole
Pseudomonas aeruginosa	Aminoglycoside (except streptomycin, kanamycin)	Carbenicillin, ticarcillin, mezlocillin piperacillin
Enterobacter	Aminoglycoside	Cephalosporin
Serratia	Aminoglycoside	Cephalosporin
Proteus mirabilis	Aminoglycoside	Carbenicillin, cefotaxime, cotrimoxazole
Salmonella	Fluoroquinolone chloramphenicol (if sensitive)	Cephalosporin

Table 5.4: Indications for prophylactic immunoglobulins

Human normal (pooled) immunoglobulins	
Hepatitis A virus infection	Travelers Debilitated children
Measles	Child with heart or lung disease
Human specific immunoglobulin	
Rabies	Postexposure protection
Tetanus	Susceptible injured patient
Hepatitis B	Needle stick injuries, sexual partner
Chickenpox	Immunosuppressed children

Table 5.5: Immunization schedule generally followed in Britain

Age	*Visits*	*Vaccine*	*Intervals*
4-12 months	3	Three administrations of DTP + OPV	6-8 weeks and 4-6 months
12-24 months	1	Measles vaccination	
First year at school	1	Booster DT + OPV	
10-13 years	1	BCG for the Tuberculin negative	
Girls: 11-13 years	1	Rubella vaccination	
15-19 years or on leaving school	1	TT + OPV	

DTP = Diphtheria, tetanus, pertussis ("triple") vaccine
OPV = Oral poliomyelitis vaccine
DT = Diphtheria, tetanus vaccine
TT = Tetanus toxiod

Table 5.6: National Immunization schedule

When	*Vaccine*	*No*	*Route*
Women pregnancy 15-36 weeks		2*	Intramuscular
Infants			
5 weeks-9 months	BCG**	1	Intradermal
5 weeks-9 months	DPT***	3	Intramuscular
5 weeks-9 months	Polio***	3	Oral
9-12 months	Measles	1	Subcutaneous
15-24 months	DPT booster	1	Intramuscular
16-24 months	OPV booster	1	Oral
5-6 years	DT	2	Intramuscular
10 years	TT	1	Intramuscular
15 years	TT	1	Intramuscular

* One booster if two doses received less than three years ago. The first dose is given at 16 weeks and the second at 20 weeks.
**BCG can be given at the earliest contact after bath. In case of institutional deliveries, it must be given after bath.
***Polio and triple should be started at the age of 6 weeks or after that at the earliest contact, and should be repeated at one month interval

Table 5.7: Indications for chemoprophylaxis

	Indication	*Drug of choice*
Short term		
1. Abdominal sepsis	Colonic/gynaec surgery	Gentamicin/cefuroxime plus metroindazole
2. Valvular heart disease	Dental, urological, gynaec surgery	Penicillin/lincomycin if allergic to penicillin
3. Tetanus	Wound or injury	Penicillin/metronidazole
4. Gas gangrene	Wound or injury	Penicillin/metronidazole
5. Diphtheria	Susceptible contacts	Erythromycin
6. Meningococcal	Susceptible	Rifampicin contacts
7. Whooping cough	Susceptible contacts	Erythromycin
Long term		
1. Rheumatic fever	Following rheumatic fever	Penicillin
2. Malaria	Travel to endemic area of residence	Chloroquine/mefloquin if resistant to chloroquine
3. Tuberculosis	Susceptible contact	Isoniazid
4. Leprosy	Childhood contact	Rifampicin + Dapsone
5. Urethritis/cystitis in female	Prior to intercourse	Nitrofurantoin

Diseases of the Cardiovascular System and Essentials of Electrocardiogram

6

DISEASES OF THE CARDIOVASCULAR SYSTEM

At all ages and in all countries, cardiovascular system is a major cause of mortality and morbidity. Congenital heart diseases accounts for higher proportion of deaths in infancy. Whereas rheumatic disease in childhood and hypertension and ischemic disease of heart in the adult life.

The heart is an important vital living pump continuously at work providing oxygen and nourishment to the body cells through the network of outgoing channels called arteries and incoming channels called veins, bringing back the deoxygenated blood and metabolites from the body cells for further disposal through kidneys and lungs.

The heart lies in the thoracic cage 2/3rd on the left side of the midline below the left costal cartilage occupies lower level on diaphragm. The right auricle lies mostly to the right of the midline extending somewhat beyond the right margin of the sternum.

Series of vertical imaginary lines are drawn on the chest for convenience of description and they are midsternal, lateral sternal or parasternal, anterior, mid and posterior axillary lines and scapular lines drawn through the inferior angle of the scapula.

CARDIAC SYMPTOMATOLOGY

1. Dyspnea.
2. Edema feet/dependent part.
3. Nocturia.
4. Angina.
5. Syncope.
6. Undue fatigue.
7. Cyanosis.
8. Palpation and chest pain with radiation.

EXAMINATION OF CARDIAC PATIENT

a. *Inspection:* See growth under or overweight, bulging or flattening of pericardium apex beat pulsation at the base of the heart and root of the neck and epigastrium, dilated veins. Jugular venous pulse, clubbing and cyanosis.

b. *Palpation:* Check the movements of the chest, pulsations and feel for vibration (thrills). See pulse rate, rhythm normal or gallop, volume, condition of the vessel wall, and character of the pulse such as normal or collapsing, anacrotic, dicrotic, bisferiens, alternans, bigeminus, paradoxus, or sinus arrhythmia which is normal phenomena. Press digitally for edema and see the blood pressure.

c. *Percussion:* To find out dullness which has crossed the normal boundaries such as in pericardial effusion, thoracic aneurysm (requires confirmation by X-ray and other tests).
d. *Auscultation:* It is done by stethoscope; See whether change of posture affects the heart sound or murmur. Timing biphasic, note the character of the heart sounds, intensity, quality, rhythm, murmurs, rub and also auscultate the femoral and carotid arteries, over the thyroid, skull, eyeballs and to hear the third and fourth heart sound on pericardial area.

INVESTIGATION FOR CARDIAC DISORDERS

1. X-ray of the chest AP and both lateral.
2. Echocardiography (dimensional, color Doppler).
3. ECG, Halter ambulatory ECG monitoring, Treadmill exercise test, thallium exercise test.
4. Angiography.
5. Cardiac catheterization and coronary angiography.
6. Cartographic coronary imaging (Non invasive).

ECG

It is a graphic record of electric activity of heart and is a most important diagnostic test. Unlike other muscles of the body, the cardiac muscle has got a unique quality of automatic rhythmic contraction through its inherent conduction system. The impulse formation and conduction produces weak electric currents, which spread through the entire body. By applying electrodes to various positions on the body, the ECG is recorded.

Diagnostic Value of the ECG

1. It helps to know cardiac muscular hypertrophy of right or left ventricle.
2. It helps to know myocardial infarction, anterior, posterior and inferior.
3. It helps to know arrhythmias.
4. It helps to know pericardial effusion.
5. It helps to know metabolic changes due to disturbance in electrolyte or changes due to potassium.

Easy way to understand normal ECG waves:

P wave = represents auricular systole
QRS = represents ventricular systole
T = represents repolarization.

CARDIOVASCULAR DISORDERS (OUTLINE)

1. Congenital heart disease.
2. Anatomical approach:
   A. Disorders of conduction system.
   B. Disorders of myocardium.
   C. Disorders of pericardium.
   D. Disorders of valves.
   E. Cardiac failure acute and chronic CCF.
   F. Coronary (artery) heart disease.
   G. Hypertension and diseases of arteries and veins.
   H. Cor pulmonale.
   I. Thyrotoxicosis and myxedema.

Congenital Common Cardiac Disorders

Broad classification: Cyanotic cardiac disorders and acyanotic cardiac disorders.

The infant is acyanotic	*The infant is cyanotic*
1. Patent ductus Asteriosus PDA	1. Fallot's tetralogy
2. Atrial septal defect (ASD)	2. Transposition of great Vesseles
3. Ventricular septal defect (VSD)	
4. Dextrocardia	
5. Familial cardiomegaly	
6. Coarctation of aorta	

Names of disorders are pathognomonic and details to be referred from cardiac textbooks if so required. Their incidence is 0.1 percent in survived live births.

Anatomical Approach

Disorders of Cardiac Rhythm and Conduction System

There is an autoexcitation center in the cardiac muscle called SA node starting auto activity and is normally controlled by a vagus nerve which slows the heart, and sympathetic nerves which accelerates the heart rate. From SA node, impulse travels to A-V node through bundle of HIS and through the right and left bundle branches to the respective ventricles.

Rhythm variations:

i. Sinus bradycardia: When heart rate is less than 60/min. found in athletes.
ii. Sinus tachycardia: When heart rate is more than 100/min. found after exercise or anxiety.
iii. Ectopic rhythm: When impulse arises elsewhere other than SA node.
iv. Atrial ectopic rhythm: Affects P wave in ECG. Atrial tachycardia may occur with rate of 140 to 220/min. as a result of rapidly firing ectopic focuses. It may last for few second or may if not treated for a day or two. Patient is aware of rapid heart rate. But sometimes may get fainting or may become breathless and anxious. Coffee, alcohol, tobacco may be precipitating factors.
v. Paroxysmal atrial tachycardia (PAT): with A-V block where auricular rate is 140 to 220/min. with varying degree of A-V block is usually due to digitalis intoxication when digitalis administration requires to be completely stopped. Practolob IV inj restores the sinus rhythm or betaloc tab (45 V) 20 to 40 mg qid or inj 5 mg IV (Astra Zeneca).
vi. Atrial flutter rate is about 300/min many impulses do not really reach the ventricles which is usually regular otherwise. This is seen in chronic rheumatic disease. Digitalis gives relief.
vii. Atrial fibrillation: The atrial rates are rapid and un-coordinated and ineffective it is found in chronic rheumatic disease. Digitalis is useful but treat thyrotoxicosis. The complications of embolism and cardiac failure to be kept in mind and tried to prevent. The mitral valvulotomy may be undertaken at the earliest in the case of mitral stenosis.

Disorders of Myocardium

a. *Acute myocarditis:*
Etiology: It is manifested as complication of diphtheria, pneumonia, typhoid, typhus, and meningitis and virus diseases such as influenza, polio as well as rheumatic fever.
Clinical features: There is sinus tachycardia rather out of proportion to the temperature there may be third HS audible arrhythmias, and acute circulatory failure and shock management. Complete bed rest, antibiotics, anti-arrhythmic drugs, O_2, and treatment of shock in acute cardiac failure.
b. *Chronic cardiomyopathies:*
They are a part of generalized disorders such as hemochromatosis, sarcoidosis, amyloidosis, muscular dystrophies, systematic lupus erythematosis, polyarteritis, alcoholism.
Clinical features: It is of CCF and arrhythmias and prognosis is fatal.

Medical management is prolonged rest and symptomatic. Alcohol to be totally stopped. Surgery has got a restricted scope.

Disease of Pericardium

Acute pericarditis: The commonest cause is myocardial infarction, coxsackie, B virus infection, rheumatic, TB, bacterial, malignant, lupus erythematosis, trauma, uremia.

Fluid in pericardial cavity can be fibrinous, serous hemorrhagic or usually due to malignancy or purulent usually due to infection may ultimately cause adhesions and obstruction of pericardial cavity (constructive pericarditics).

Clinical features: Pericardial pain is variable; when present it is sharp and aching increases by

movements, inspiration and lying flat. It could be severe in viral infection. If fluid is large, the feeling of compression at pericardial region is felt. Pericardial localized friction rub is diagnostic best heard at left lower sternum and which is increased by inspiration. Heart sounds low and muffled tachycardia is present, pulses paradoxus may occur. As a rule it disappears with increase of pericardial effusion.

ECG shows ST elevation with upward concavity over the affected area later on "T" inversion is seen.

Investigations: X-ray, ECG fluid aspiration and lab tests.

Management: The disease is serious, requires careful hospital treatment of causes as well as symptomatic.

Diseases of Heart Valve and Ineffective Endocarditis

There are four valves in the heart. Mitral, aortic, tricuspid and pulmonary. The defects are either stenosis or incompetence.

Mitral stenosis The mitral stenosis which is 5 cm in diastole becomes 1 cm short and deformed due to rheumatic heart disease; resulting atrial fibrillation and thrombus formation in the left atrium where pressure increases retrograde into the pulmonary veins and loss of lung compliance. The right ventricle has to push the blood against pressure becomes hypertrophied affecting the systemic venous return adversly.

Clinically the patient is breathless even at rest more so when atrial fibrillation occurs, hemoptysis, angina, episodes of embolism and hemiplegia more common in children; there may be malar flush. The jet of blood through the mitral valve causes sound called "opening snap," and presystolic murmur. The pulmonary valves closer causes loud second heart sound loud. Due to restricted cardiac output the pulse volume is small.

The ECG shows "P" wave bifid and atrial hypertrophy and may shows even fibrillation. There is right ventricular hypertrophy.

Treatment: Consists of chronic congestive failure and hemoptysis management and radical is mitral valvotomy after due assessment. It is done with a dilator into mitral valve. The outlook is encouraging although recurrence after 5 to 10 years is not uncommon. Calcification in mitral valve is more or less contraindication, due to the complication of mitral regurgitation. No surgery permisable when active rheumatic disease is present.

Mital Regurgitation

Causes: Complications of mitral valve surgery, rheumatic heart disease, diphtheria, viral myocarditis, or cardiomyopathies, it may be even due to damage to the papillary muscles and cords tending to rupture after infarction. But, in such cases onset is sudden and leads to acute pulmonary edema. In older age group, myxedematous degeneration of mitral valve causes mitral regurgitation.

Clinical features: Apical systolic murmur will be heard into left axilla accompanied with Apical systolic thrill is pathognomic. First heart sound is low and third heart sound is loud and short mid diastolic murmur.

ECG shows left atrial and ventricular hypertrophy.

Treatment: The only effective treatment is mitral valve replacement.

Aortic Stenosis

Causes: Congenital, rheumatic disease, in old age.

Clinical features: Lowered cardiac output causes diminished exercise tolerance, syncope, angina, nocturnal dyspnea, sudden death may occur.

Physical signs: Systolic murmur at the base, thrill, transmitted to carotid arteries called "carotid shudder," ECG and X-ray chests are confirmative and helpful.

Treatment: Apart from usual management the only effective treatment is replacement of aortic valves and in some cases valvotomy may be a treatment of choice.

Aortic Regurgitation

Causes: Congenital bicuspid valves damaged aortic valves due to rheumatic diseases, due to dilatation of root of aorta due to syphilis or atheroma. There is left ventricular hypertrophy.

Clinical features: Breathlessness, angina, paroxysmal nocturnal dyspnea, increase in pulse pressure, gross pulsation in the large arteries called *"Muscle knock."*

Treatment: Valve replacement with prosthesis is the treatment of choice.

Tricuspid Valve Disease

A. *Tricuspid stenosis:* Is usually due to rheumatic heart disease. Is almost always accompanied with mitral stenosis with similar clinical features as mentioned under mitral stenosis. Acitis and edema is more common.
   Treatment: Surgery is less satisfactory as compared with mitral sinosis.

B. *Tricuspid regurgitation:* Shows more marked right ventricular hypertrophy there is "C" wave in jugular venous pulse.

   Treatment: Replacement of valve with prosthesis.

Pulmonary Valve Disease

a. *Pulmonary stenosis:* Mostly congenital as in Fallout's tetralogy. Ejection systolic murmur at the base radiating to the left shoulder is reliable sign is usually accompanied with thrill. There is marked right ventricular and right auricular hypertrophy.

   Treatment: Pulmonary valvotomy.

b. *Pulmonary regurgitation:* It is very rare, usually features of pulmonary hypertension "Graham steel" murmur best heard at left sternal edge to be distinguished from murmur of aortic regurgitation.

INFECTIVE ENDOCARDITIS

Causes

Bacterial septicemia, coxiella virus and fungi. More common in rheumatic heart disease, in VSD, in PDA, concomitant with other valvular lesions are also present.

Clinical Features

Pyrexia persistent, excessive sweating at night, anemia, splenomegaly, embolic episodes and stroke, CCF and death, purpura splinter hemorrhages under the nails, Osler's nodes painful and tender are helpful sign at the fingertips. Clubbing in late, spleen and hepatomegaly embolism may cause cerebral and coronary and splenic infarctions. Hematuria is present.

Investigations

CBC, ESR, blood culture and sensitivity test, ECG, X-ray chest are helpful and give best guidance for management.

Treatment

Antibiotics, removal of septic focuses or treats them effectively. Hospitalization, complete bed rest and treatment of the causes are essential.

In advanced cases, when the valve damage is considerable, the surgical replacement is preferred.

Prevention

Through antibiotic umbrella for long periods is indicated. The removal of septic foci should not be neglected at any cost and while doing so, antibiotics before and after to be used without fail.

CARDIAC FAILURE

The pumping action of the heart is done by right and left ventricles. When their function starts gradually failing it is called cardiac failure.

Right Ventricular Failure

Cause reduction of right ventricular output. Is Usually secondary to:

i. Left ventricular failure.
ii. Pulmonary pathology such as pulmonary valvular diseases, acute massive pulmonary embolism or chronic pulmonary diseases such as asthma, chronic bronchiactasis, TB, pneumoconiosis, primary pulmonary hypertension, recurrent pulmonary embolisms, harmophysis.
iii. Anatomical chest deformities such as kyphoscoliosis add to the seriousness.
iv. Infections such as rheumatic disease, diphtheria, causes toxic myocarditis.
v. Nutritional deficiency such as anemia, wet beriberi affects the myocardium also
vi. Endocrine such as thyrotoxicosis.
vii. Circulatory causes such as arterio venous fistula and shents, myxedema.
viii. Arterial fibrillation/paroxysmal tachycardia.
ix. Obstructive such as constructive pericarditis.

Clinical Features

Headaches, insomnia, confused mental state, nausea, vomiting, flatulence, constipation or diarrhea, menstrual disturbances in ladies, cyanosis, visible jugular pulsation, liver palpable and tender, ascities and pulmonary congestion.

Treatment

Hospitalization, bed rest, low salt, low caloric diet, fluid restriction, diuretics and most importantly the digitalis which can be given to start with 1.2 mg and thereafter, 0.5 mg 6 hourly till the condition is controlled and thereafter, 0.25 mg daily 6 days a week as maintenance dose.

All other drugs such as analgesics, laxatives, anticoagulants and anti-thyroid drugs if thyrotoxicosis is present. This part of treatment has got their own important place in dealing with the patients.

Venesection and paracentesis if required for ascites and hydrothorax give considerable symptomatic relief.

Left Ventricular Failure

Causes

i. Hypertension.
ii. Aortic stenosis and regurgitation.
iii. Coronary artery diseases.
iv. Mitral stenosis.

Clinical Features

Dyspnea, distressing dry cough, Cheyne-Stokes respiration, sometimes hemoptysis when associated with embolism.

Physical Signs

BP may be raised, there may be pulses alternans and gallop rhythm, second pulmonary sound loud, pulmonary congestion, X-ray and ECG show cardiac enlargement with hilar prominent shadows.

Treatment

It is a serious condition and requires hospitalization. Best nursing care, oxygen inhalation, cardiac rest, and injection of morphine with atropine. SC Aminophylline injection IV slow, cardiazol or nikethamide IM and if required venesection and removal of 500 cc of blood at a time.

INFECTIVE ENDOCARDITIS

Endocarditis is an affection of endocardium due to bacteria, viruses such as Coxiella or fungi. It may be fulminating in acute form and could be very serious. In the insidious form, it goes on for months together with mild and general symptoms unless suspected and investigated the diagnosis cannot be established.

Clinical Features

Unusual fatigue, pallor, anemia, anorexia, low grade persistent fever, splenomegaly; the disease is fatal if not effectively treated.

Investigation

ESR increased, presence of anemia, thrombocytopenia, disturbed liver function, blood culture and sensitivity test, complement fixation for Coxiella virus are helpful.

Treatment

Treat the cause, bed rest hospitalization, nourishing but light diet, antibiotics, analgesics, antipyretics, laxatives, vitamins, iron and folic acid, plenty of fluids.

Coronary Heart Disease (Ischemic Heart Disease)

Definition

An occlusive disorder with or without thrombosis of coronary arteries causing insufficiency of blood supply to the heart muscle to meet the physiological demands is called ischemic/coronary heart disease, which is manifested as angina pectoris, coronary insufficiency or myocardial infarction.

Incidence

Ever increasing due to fast life, increasing stress and tension in modern urban life.

Sex

Four times more common in men.

Heredity

Fifty percent cases give positive family history.

Habits

Is more common in smokers of cigarettes. There is no evidence that alcohol is responsible for high male incidence.

Pathogenesis

1. *Atheroma:* Lipid substances accumulate in the intima of the aorta and larger arteries in patchy irregular fashion causing various degree of narrowing of the lumen specially when encroaching on opening of the lumen of the coronary vessel. They also cause pressure atrophy on the underlying media affecting the arterial elasticity, but the narrowing/obstruction is only caused by thrombosis. It is quite rare in vegetarians.
2. Blood lipids include natural fat, fatty acids, free cholesterol and its easters as well as phospholipids. The serum cholesterol 150 to 300 mg percent is definitely related to arteriosclerosis. The atheroma patches contain high proportion cholesterol.

   The cholesterol and phospholipids are carried in combination with alpha or beta globulins and are called alpha or beta lipoproteins and their presence is demonstrated in atherosclerosis.
3. Atherosclerosis is a most common cause of angina pectoris leading to myocardial infarction and its complications are cardiac failure to sudden death.

ANGINA PECTORIS

It is a clinical syndrome caused by reduced blood flow to the heart less than required. These are the two factors:

A. Reduced blood flow as in aortic stenosis, obstructive cardiac myopathy, constructive pericarditis, hypertension.
B. Increased requirement such as exercise of exertion, anemia, hyperthyroidism.

Clinical Features

There is a sense of compression or tightness in the middle of the chest induced by exertion or anxiety. It is worst while walking fast, uphill or climbing stairs, particularly after meals on a cold day, and

the feeling is reduced by rest. Similar conditions may occur due to coronary spasm with borderline ECG changes but they are reversible. The pain and discomfort radiate to left arm, wrist and hand with feeling weakness. Rarely the radiation of pain goes to left scapular or intrascapular epigastric, to the neck or jaw.

Investigations

ECG is normal on rest and abnormal after exercise CBC for anemia, thyroid function tests, X-ray chest for cardiomegaly.

Cartographic Imaging

Differential Diagnosis

Asthma, pericarditis, ostiochondritis, hiatus hernia.

Treatment (glyceryl trinitrate)

1. **Angised (GSK)** 0.5 mg tab one to be kept under tongue every 3 min till the chest pain is relieved. (Not to be chewed or swallowed)
   Contraindication: Hypertrophic cardiomegaly, cerebral hemorrhage.
2. **ATEN (Atenolol**) 50, 100 mg tablets
   (Cadila health care) only one tablet daily as prophylaxis.
   Contraindication: Bradycardia, heart block CCF, hypotension.
3. **Betaloc (Metoprolol tart.)** 50, 100 mg tab (Astrane Zeneca) 1 tds and also inj 1 mg/cc im if acute myocardial infarction is there.
   Contraindication: Bronchospasm, asthma, pulmonary hypertension.
4. **Ciplar (Propranolol HCl.) CIPLA** 10, 40, mg tab 1 tab tds.
   Contraindication: Asthama, CCF, MI, heart block, hypertension and shock.
5. **Clinium (Lidoflazine)** 60 mg tab 1 od after food. First week 1 bd after food second week. One tds after food third week and therafter.
   Contraindication: Pregnancy.
6. **Depin:** 5 mg 10 mg cap (Cadila Health Care) and also Depin retard 20 mg cap and also depin SR 30 mg cap start with lower dose and increase gradually.
   Contraindication: Aortic stenosis, MI, pregnancy and lactation.
7. **Dilzem (diltiazem)** 30, 60 mg tab before food (Torrent) 1 tab tds lts for long time use.
   Contraindication: Pregnancy, lactation, hypotension, hepatic and renal impairment and diabetes.
8. **Dynasprin (Aspirin 5 mg + Dipyridamole 75 mg (USV)** 1 tab tds 1 hour before food.
   Contraindication: Allergy to aspirin, peptic ulcer, bleeding disorders.
9. **Flavedon:** 20 mg tabs and Flavedon MR 35 mg dose 1 bd
   Contraindication: Pregnancy and lactation.
10. **Inderal:** 10,40,80 mg tabs (Propranolol HCl) (Nicholas Piramal) dose 1 tds can be increased after one week.
    Contraindication: Asthma, CCF, acute MI, heart block, hypotension, shock.
11. Chelation Therapy about 13 or more sittings biveekly if recommended by treating cardiologist.

Surgical Treatment

Surgical coronary bypass can give dramatic improvement in drug resistant cases when multiple coronary arteries are affected.

MYOCARDIAL INFARCTION (HEART ATTACK)

Definition

Death and necrosis of portion of myocardium due to coronary artery occlusion usually due to thrombosis and when collateral circulation is inadequate which is followed by fibrosis.

Predisposing Factors

1. Age between 40 to 70.
2. Family history positive in about 50 percent of patients

3. Sex: 4 times more common in men.
4. Underlying disorders: hypertension, diabetes, obesity, stress and tension, syphilis, Aids.
5. Arteriosclerosis, hyperlipidemia, overweight.
6. Psychiatric: emotional shock, death of nearby relation.

Symptoms

H/o angina, pain onset is abrupt, dull aching and agonizing behind the upper sternum, radiating usually to left arm but occasionally to right, neck, jaw interscapular region, epigastrium and usually continuous. Restlessness, anxiety, dyspnea, vomiting, syncope, profound sweating and shock. **Less than 5 percent of cardiac infarctions are symptomless and half of them are completely silent and diagnosed by routine ECG.**

Signs

Heart sounds low, muffled, first heart sound inaudible, tachycardia, tic-tac or gallop rhythm. Pericardial rub may be heard, BP low, systolic BP may go to 100 or 80 mm.

Fever appears after second day 100 or 102° F.

Investigations

CBC shows leukocytes, ESR raised. Urine trace of albumin, SGOT and SGPT raised. ECG may be normal or show ST elevation. The changes are as below.

A. Anterior infarction: The elevation of ST segment in lead I and II. Depression in lead III. Prominent Q in chest lead IV "R" absent and ST shows coving.
B. Posterior infarction: Elevation of ST segment in lead III. Depression in lead I and inversion of T, prominent Q III.
C. Inferior infarction: ECG is usually normal. ST segment, depression and later symetrical T waves may be seen V2 to V6 as reciprocal changes of inferior wall infarction.

Complications

1. Arrhythmias: Sinus tachycardia, sinus bradycardia may result in syncope is also a special feature in inferior myocardiac infarction, atrial tachycardia and fibrillation may occur leading to cardiac failure or hypertension requiring urgent treatment.

   The ventricular arrhythmias are even more dangerous. Ventricular tachycardia carries high mortality. Ventricular fibrillation appears in about 10 percent of patients in warst proguostiesign.

   Various degree of atrioventricular blocks are also common which may lead to complete heart block common in anterior myocardial infarction when both bundles are involved in the interventricular septal infarction when the infarction is extensive and condition of shock is always present.
2. Cardiogenic shock: It is a very serious condition demanding urgent proper treatment. If infarction is extending an arrhythmias progress there is acute ventricular failure, pulmonary edema, renal failure and cardiac arrest leading to death.
3. Cardiac failure and pulmonary edema.
4. Rare complication is rupture of mitral papillary muscle causing mitral regurgitation.
5. Rupture of interventricular septum followed by severe hypotension and venus pulmonary hypertension.
6. Rupture of myocardium leading to cardiac temponade calls for emergency cardiac surgery (the cardiac temponade is compression of heart by large quantity of blood or fluid in pericardium interferes with diastolic filling of the heart ventricle) as a result of this, stroke output is reduced. There is compensatory tachycardia, fall of blood pressure and increase in the venous pressure. There is shock and you may feel pulses paradoxus in exaggerated variation of volume with breathing. Possibility of venous thrombosis

and postmyocardial infarction syndrome giving rise to persistent fever pericarditis and pleurisy. Cardiac aneurysm may develop causing painful shoulder.

Treatment

Aims of the treatment

1. Give relief to the pain discomfort and anxiety.
2. Reduce the work of the heart till the infarction is healed.
3. Overcome the shock.
4. Treat the cardiac failure.
5. Treat the complications.

General and Symptomatic Treatment

1. Complete bed rest 3 to 6 weeks monitored with ESR, ECG, BP.
2. Lie flat if there is shock keeping the head low.
3. Prop up giving back rest if BP permits.
4. O_2 intermittently.
5. Diet : Tea coffee, milk and fruit juices first three days and then gradually switch on to biscuits, soft bread, white of an egg and porridge.
6. Bowels: Enema, mild laxative such as milk of an magnesia
7. For pain give morphine 0.25 gr + atropine 1/100 gr SC or IM or dilaudid 1/32 gr inj SC or pathedine 100 mg IM to be repeated 4 to 6 hourly.
8. For arrhythmia give digitalis if cardiac failure or auricular arrhythmia.
   Quinidine 2 gr fourth hourly to prevent arrhythmia.
9. For shock, give 5 percent glucose IV slow drip with vitamins and vasopressor drug like veritol 1 to 2 cc or neocynephrine inj IM fourth hourly (Adrenalin is contraindicated). Plazma IV slow drip 200 cc (avoid danger of overloading the heart).
   Antibiotics for prevention of pulmonary infection.
   Anticoagulants such as:
   a. Tromaxan 900 to 1200 mg first day then 300 mg thrice a day for 3 to 4 weeks (keep a watch by monitoring the prothrombing time).
10. Treatment of complication due to cardiac failure: Which is of two types:
    a. Right ventricular failure.
    b. Left ventricular failure.

Right Ventricular Failure

1. Give digitalis by rapid single dose of 1.2 mg and then 5 mg 6th hourly, or by slow method 0.5 mg. Three times a day or after control the maintenance dose of 0.25 mg daily for six days a week.
2. Give diuretics 0.5 cc inj IM first day if safe 2 cc IM every fourth day then orally as necessary.
3. Aminophyllin 0.25 gm IV slow helpful in respiratory involvement.
4. Analgesics, hypnotics, sedatives, vitamins, laxatives and anticoagulant maintenance therapy.
5. If pulmonary edema give hypertonic glucose IV.
6. Physiotherapy to prevent peripheral thrombosis.

Treatment of Arrhythmia

In acute phase of mitral infarction arrhythmia are met with multiple ectopic beats called extrasystoles, ventricular tachycardia requires to be treated by lignocaine inj IV and if does not work, one has to embark on practolol 5 mg IV slowly and if so required increase the dose gradually up to 25 mg.

If situation arises, one has to give Mexiletine IV to 200 mg. Slowly over 5 to 10 min or on long-term basis 200-250 mg 6th hourly by mouth.

IV lignocaine is given as bolus 5 to 10 ml of 1 percent solution in 5 percent glucose infusion drip. If given fast, it may produce confusion, fits, coma and respiratory depression.

If ventricular fibrillation starts give DC electric shock immediately, if not available go for cardiac massage or artificial ventilation. If cardiac defibrillator is available use it without any waste of time.

Atrial tachycardia, flutter, fibrillation are best treated by digoxine but if there is hypotension use atropin. If heart block is advanced, it may be well worth to introduce a pacing catheter into right ventricle to maintain the rhythm.

Oxygen is most urgent in pulmonary cases and also in shock. The aim of the treatment is to reduce systolic BP less than 160 mm and to reduce the diatonic pressure less than 90. In elderly diabetics check the BP in lying down as well as standing position and also BSL fasting and PP daily.

Treatment

1. Hospitalization is compulsory. The diagnosis should be revealed to the patients and the relations and their cooperation is sought.
2. Low salt, low caloric diet to reduce the weight.
3. Omit smoking totally.
4. Limit the physical activity, stress and strain by changing the life style.
5. Drugs:
   a. Diuretics
   b. Beta blockers
   c. Calcium channel blockers
   d. ACE inhibitors.
   e. Angiotensin receptor blocker (ARBS).
   f. Alpha-blockers g vasodilators
   h. Emergency drugs for IV treatment

Diuretics

1. Diurix 2.5 mg tab 1.5 mg SR one tab od.
2. Indicontin 1.5 mg. tab (Modi Mundi) one tab od.
3. Lorvas 2.5 mg tab (Torrent) 1 od.
4. Natrilix 2.5 mg tab and SR 1.5 mg tab one tab od.

Other Drugs for Control of Hypertension

1. Aceten (Captopril 12.5, 25 mg tab (Wockhardt) 1 bd.
2. Alphadopa 250 mg tab (Wock Hardt) 1 od.
3. Amlodac (Amlodipine Besylate) 2.5 mg tab or 10 mg tab (Zydus Medica) 1 od.
4. Amlopress 2.5 mg tab (Cipla) 1 od.
5. Arkamin 5 and 10 mg (Clonidine HCl) 100 mg tab (Unicum) arkamin—H 1 bd with Clorothiozol).
6. Aten 25, 50, 100 mg tab (Cadila Health Care) and 1 od.
7. Benace 5,10 mg tab (Novartis) 10 mg od.
8. Beptazine (Propranolol 40 mg + and dihydrallazine 25 mg) (MM Lab) 1 bd.
9. Betaloc 50, 100 mg tab (Astra Zeneca) 1 bd (Metaprobl Tart).
10. BQL (Enalapril maleatc) 2.5,5,10 mg (Cadila Health Care) 1 od.
11. Calaptin SR (Vera Pril HCl) (Nicholas Piramal) 120-240 mg od.
12. Calchek 2.5, 5, 10 mg tab (Ipca) (Amlodipin basylate) 1 od.
13. Calsigard (Nifedipine) 5-10 mg cap–(Torrent) 1 od.
14. Cardace 1.25, 2.5, 5 mg cap (Aventis) 1 od (Ramipril).
15. Ciplar (Propramololhel) 10, 40 mg tab 1 bd. Ciplar-H (Propramololhel, Hydrochlora Liazid) 1 bd.
16. Cipril (Lisinopril Dihydrate) 2.5, 5, 10 mg tab 1 bd and also Cipril - H.
17. Covarsyl (Perinorriltart) 2 mg, 4 mg tab (Serdia) 1 od.
18. Depin, Depin Retard (Nifedepine) 5,10 mg cap 1 bd (Cadila Health Care).
19. Envas (Cadila Health Care) 2.5, 5, 10 mg tab 1 bd.
20. Nuril 2.5, 5, 10 mg tab (USV) 1 bd.
21. Priscolin 100-200 mg orally, 10 to 20 mg inj SC or IM and if IV give very slowly.

Surgical Treatment

Thoracolumbar sympathectomy when medical treatment fails; (disadvantage of postural hypotension, erectile dysfunction).

Diagnostic Importance of Fundoscopy

The arteriolal blood columns is narrower than normal. Thus, the veins at arteriovenus crossings are narrowed because of "nipping" a diagnostic sign, hemorrhages and soft exudates are seen along with hypertensive retinopathy.

Thus the therapeutic policy depends upon

1. Oral diuretics.
2. Sympatholytic drugs such as beta adrenergic receptor blocking drugs such as propranolol.
3. Sympatholytic agents such as clonidine and methyl dopa.
4. Adrenergic blocking drugs such as dehisoquine.

In such cases, malignant hypertension when BP is 300/160 requires urgent IV therapy use diazoxide 300 to 600 mg IV a bolus injection and others also use reserpine 1 to 5 mg inj IM both are very effective but needs to be followed by adequate oral therapy.

Similar treatment is essential in hypertensives encephalopathy.

The Treatment of Secondary Hypertension

1. Coarctation of aorta: Occurs just below the original of left sub-clavian artery. About 50 percent of cases have bicuspid aortic valve. The symptoms of hypertension in the upper half of the body and symptoms of hypotension in the lower half of the body. The systolic murmur is over the coarctation best heard posteriorerly. The dilated tortuous vessel exhibiting arterial pulsation are seen and palpable around the scapulae and posterior intercoastal space more prominent when patient bents forward. Treatment is surgical closure of the defect, which is best done before the age of ten. Otherwise the complications of left ventricular failure, cerebral hemorrhage and hypertensives encephalopathy can cause death.
2. Treatment of secondary hypertension due to renal diseases:
   a. Acute and chronic nephritis.
   b. Pyelonephritis.
   c. Systematic lupus erythematosis (SLE).
   d. Polyarteritis nodosa.
   e. Polycystic kidneys.
   f. Renal arteries sinosis.

   All these require surgical treatment.
3. Endocrine disorders:
   a. Pheochromocytoma
   b. Cushing's syndromes
   c. Primary aldosteronism
   d. Oral contraceptives
   e. Estrogen therapy.

   All these conditions yield to the medicosurgical treatment.
4. Pregnancy toxemia: Guarded medical treatment if fails termination of pregnancy.

CORONARY ARTERIES

Arteries that supply the heart are called coronary arteries (Fig. 6.1).

A. Left coronary artery.
B. Right coronary artery.

A. Left coronary artery is divided into:

I. Left anterior descending artery – supplies anterior surface of left ventricle and lower part of right ventricle and also lower third.
II. Cerumflex artery – Supplies the lateral wall and lower apical half of posterior of left ventricle.

B. *Right coronary artries supplies S-A node and upper half of posterior wall of the left ventricle.*

CARDIAC CONDUCTION SYSTEM

The cardiac cells have capacity of self-excitation. The impulse starts from sind articular node which apart

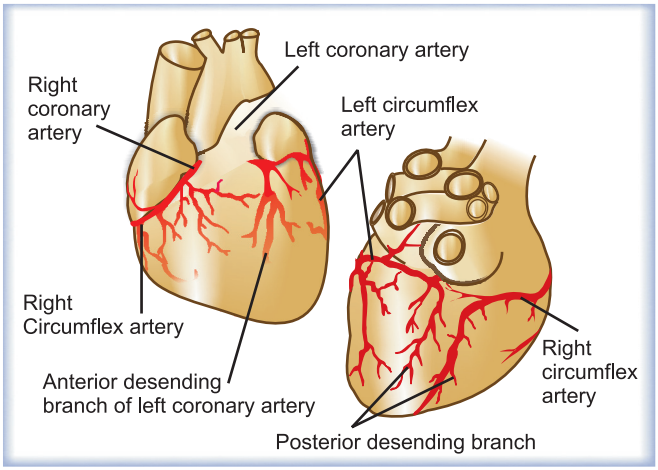


Fig. 6.1: Coronary circulation

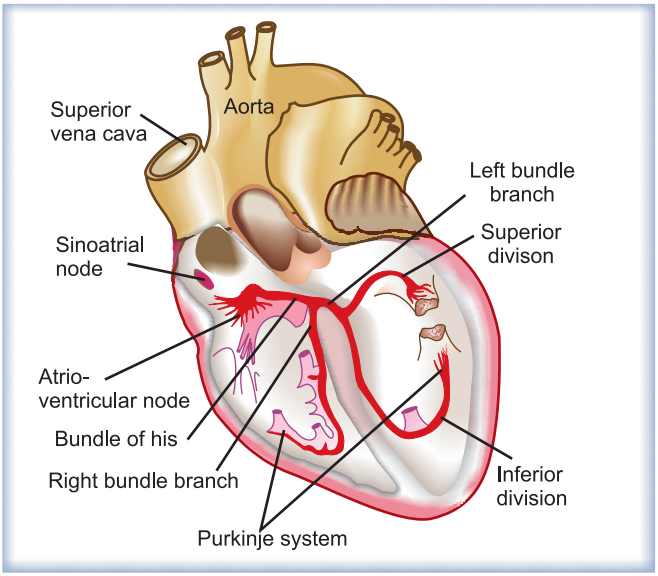


Fig. 6.2: Cardiac conduction system

from self intrinsic capacity is always under control of sympathetic nervous for decreasing the rate and under vagal control.

From S-A node impulse travels to atrioventricular nodes and through bundles of His is divided into right bundle branch and left bundle branch and ramify in Purkinje system.

An Illustrative figure is as below (Fig. 6.2).

Cor Pulmonale

Cardiac involvement while primary disease in the lungs such as pulmonary tuberculosis, pulmonary embolism, pulmonary fibrosis, malignancy, granulometus causes right ventricular failure followed by congestive cardiac failure is called cor pulmonale.

There is dyspnea, clubbing of fingers, a degree of cyanosis, low vital capacity of lungs and the signs and symptoms of primary lung diseases requires to be investigated and diagnosed and necessary treatment along with the treatment of right ventricular failure requires to be done.

Diseases of Arteries

1. Degenerative such as arteriolosclerosis, atherosclerosis obliterance, and dissecting aneurysm of aorta.
2. Inflammatory such as polyarteritis, nodosa, thrombangitis obliterance, cranial arteritis, Takayasu's syndrome (Pulseless disease) and syphilitic arteritis.
3. Occlusive such as sudden occlusion of major artery by embolism.
4. Vasoplastic Raynaud's disease.

All these uncommon disorders cause lack of blood supply or even complete obstruction to blood flow causing ischemia and infarction and thus loss of function totally causing all signs and symptoms of local disfunctions of the organ, which may include vital organs. When suspected, the reference to the relevant literature is necessary with consultation to general physician and hematologist.

Diseases of Vein

1. Inflammatory—thrombophlebitis.
2. Noninflammatory—phlebothrombosis.

   The etiological features are as follows:

   i. Slowed venous circulation due to various reasons including CCF.
   ii. Injury to veins damage to veins may be due to trauma, operation, IV injection and puncturing multiple veins.
   iii. Increased coagulability of blood such as dehydration, polycythemia and in malignancies
   iv. The diagnostic criteria between thrombo phlebitis and phlebothrombosis is as below.

There is pain in the calf, tightness, tenderness, and fullness of superficial veins increase in temperature in case of thrombophlebitis, palpable thrombus vein, local edema, and slight discoloration.

Treatment: Prevention of pulmonary embolism aspirin and anticoagulants restoration of circulation by passive and active exercises, fomentation if pain is more.

Prospectus of Cardiology

1. Genetic engineering advancement will reduce the incidence of congenital heart disease.
2. Advanced surgical scenario will positively reduce the mortality and morbidity of existing congenital heart diseases.
3. Use of prolonged antibiotics preventively and removal of septic foci will reduce the incidence of rheumatic heart diseases.
4. Valvular surgery will give positive aspect of existing valvular abnormalities.
5. Hypertension, secondary type are almost treatable to medical and surgical combined therapy.
6. Essential hypertension is controllable by medical treatment.
7. Myocardial infarction, acute and sub-acute is treatable by prompt, medical therapeutic efforts provided in ICU.
8. Modern advanced methods of arteriography can yield to by pass surgery and thromboplasty and chelation therapy.
9. Method of recession and rehabilitation of cardiac cases will substantially reduce the morbidity.
10. Public awareness of cardiac care will contribute to timely remedial methods.

Thus the outlook of cardiology is optimistic and positive towards to object of reducing mortality and morbidity in future depending up on cost facter and affordability.

ESSENTIALS OF ELECTROCARDIOGRAM

WHAT IS ELECTROCARDIOGRAM (ECG)

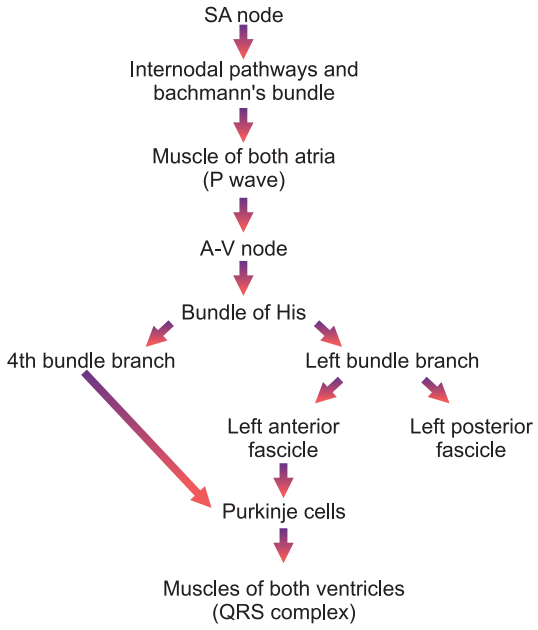
ECG is a graphic depiction of the electrical forces generated by the heart.

ECG appears as deflection associated with each cardiac cycle.

WHAT WE KNOW BY ECG STUDY

a. Heart rate.
b. Rythm of heart.
c. Information about chambers of heart.
d. Blood supply to cardiac muscles.
e. Pericardial disease.
f. Conduction defects.

SEQUENCE OF HEART ACTIVATION (FIGS 6.3A AND 6.3B)



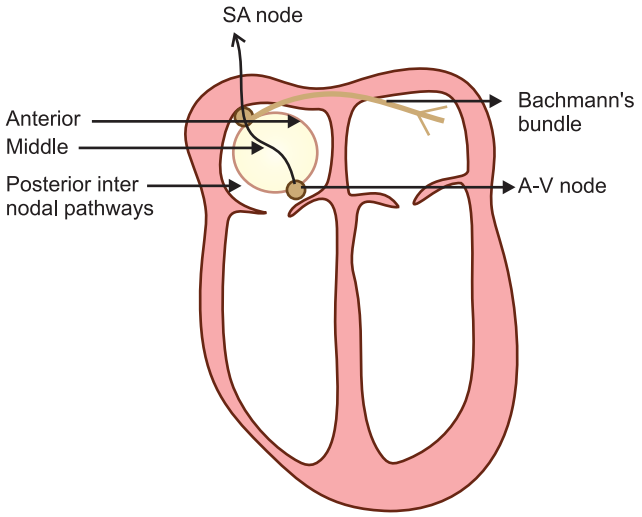


Fig. 6.3A: Atrial conducting system. Impulse starts from SA node and passes to A-V node

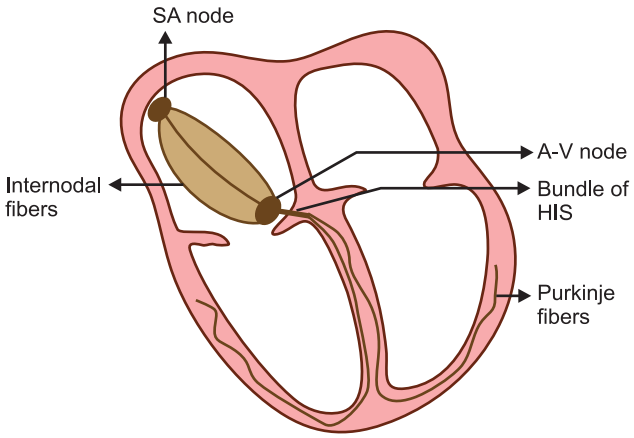


Fig. 6.3B: Ventricular conducting system. From A-V node impulse travels to bundle of His and from there to left desending branches and finally reaches to Purkinje fibers

WHAT DOES ECG COMPLEX INDICATES

ECG Complex indicates the electrical activity per beat that includes repolarization and depolarization.

PRINCIPLE BEHIND ECG

A simple heart beat comprises of depolarization and repolarization.

Depolarization: Positive charge on surfaces of myocardial cells changes to negative charges.

During this procedure cardiac muscles con-tract.

Depolarization in followed by repolarization.

Repolarization: This is the resting state.

Negative surface charges on the myocardial cells changes or return to positive surface charges.

Repolarization is necessary before depolarization can occur again depolarized myocardial cells can not be stimulated or activated again to contract until they are repolarized.

This depolarization and repolarization is recorded by ECG.

ECG ELECTRODES AND LEADS

12 Lead ECG: 12 Leads records the electrical activity in the heart from 12 different views.

Limb leads: Six of 12 leads are limb leads. These are placed on:

- Right arm (RA), White
- Left arm (LA), Black
- Right leg (RL), Green
- Left leg (LL), Red

Chest leads: Other six of 12 leads are chest leads. These are placed on specific areas of chest overlying heart.

These are V_1, V_2, V_3, V_4, V_5, V_6.

INTERPRETATION OF CARDIAC IMPULSE ON ECG (FIG. 6.4)

ECG graph consists of series of deflections or waves.

P WAVE (FIG. 6.5)

- Produced by atrial depolarization
- Reflects the sum of right and left atrial activation
- Normally upright
- Less than 2.5 mm in height (.25 mV)
- Less than 2.5 mm in width (.10 sec)
- Has single peak and no notch.

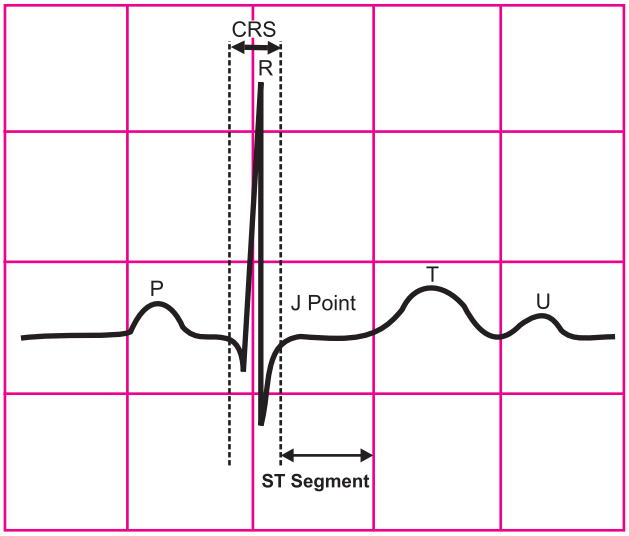


Fig. 6.4: The normal ECG deflections

Fig. 6.5: Normal P waves

Absence of P Wave

8. Atrial fibrillation → Replced by small irregular fibrillatory wave.
2. Atrial Flutter → P waves replaced by flutter waves.
3. Junctional rhythm → P waves may precede or are buried in QRS completed.
4. Ventricular techycardia → P waves or difficult to identify
5. Hyperkalemia → P waves are reduced in amplitude or altogether absent.

Inverted P Wave

1. Junctional rhythm.
2. BY-pass tract: Occurs in WPW syndrome.

Tall P Wave

1. Right atrial enlargement also called as P pulmonale as in Figure 6.6.

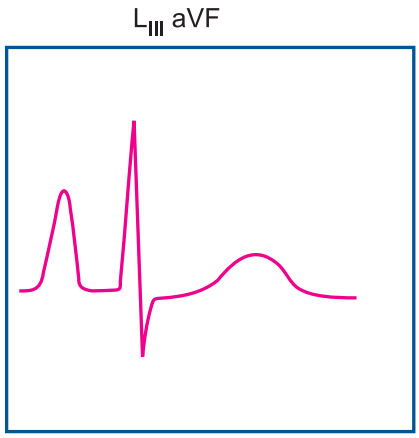


Fig. 6.6: Tall, peaked P wave in III, aVF

Fig. 6.7: Broad, notched P wave in L_1, aVL

Broad P Wave

1. Enlarged left atrium.
2. Broad P wave in known as P mitrale since it is often associated with mitral valve disease in Figure 6.7.

QRS COMPLEX

- It is a major positive deflection on ECG
- Produced by ventricular depolarization
- Represents timing and sequence of synchronized depolarization of right and left ventricles (Fig. 6.8).

Q Waves

- Not visible in all ECG leads
- Less than .04 sec in duration (Fig. 6.9).

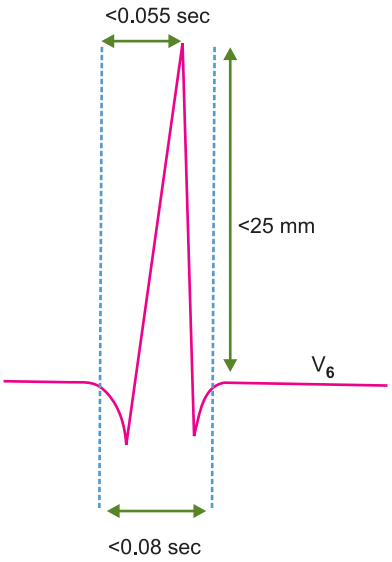


Fig. 6.8: Normal QRS complex

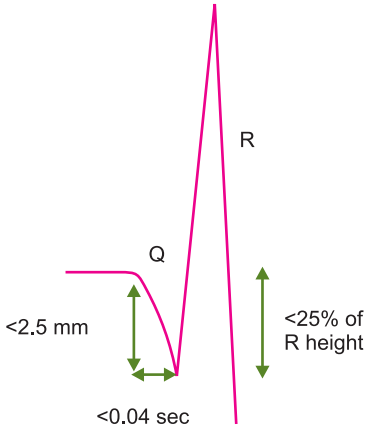


Fig. 6.9: Normal Q waves

R Wave

- Major positive deflection
- Mostly upright
- In limbs R wave voltage is 5 mm
- In Precordial R wave voltage is 10 mm.

S Wave

- Negative deflection following R wave
- Normal voltage is 0.7 mV.

Low Voltage QRS Complex (Fig. 6.10)

1. Diffuse myocardial disease.
2. Hypothyroidism.

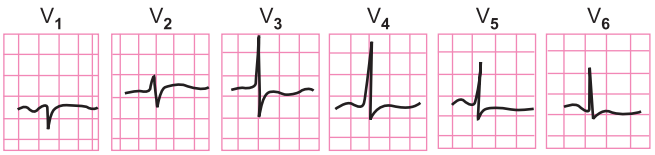


Fig. 6.10: Hypothyroidism:
low voltage graph, T wave inversion

3. Constrictive pericarditis.
4. Adipose tissue in obesity.
5. Muscle in thick chest wall.
6. Air in pulmonary emphysema.
7. Fluid in pericardial effusion.

ALTERNATING QRS VOLTAGE

1. Moderate to severe pericardial effusion.
2. Ischemic cardiomyopathy.
3. Myocarditis.

ABNORMAL QRS AXIS

Abnormalities of QRS axis include

a. Right axis deviation
   - Thin lean built
   - Inspiration
   - Childhood
   - Right ventricular hypertrophy
   - Left posterior hemiblock
   - Reverse arm electrodes
   - Dextrocardia (Mirror image).

b. Left axis deviation
   - Obese built
   - Expiration
   - Old age
   - Inferior wall infarction
   - Pulmonary emphysema

c. Indeterminate or North-west axis
   - Severe right ventricular hypertrophy
   - Aneurysm of left ventricular apex.

NON-PROGRESSION OF R WAVE

1. Pulmonary emphysema.
2. Old anterior wall infarction.

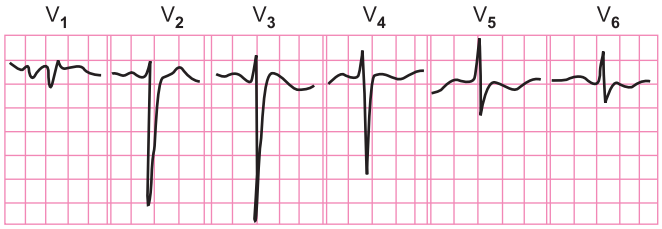


Fig. 6.11: Poor R wave progression in precordial leads in cases emphysema

3. Diffuse myocardial disease.
4. Left bundle branch block.
5. Left ventricular hypertrophy (Fig. 6.11).

ABNORMAL Q WAVE

Absent Q Waves

- Small infarction
- Right ventricular infarction
- Posterior wall infarction.

ABNORMAL R WAVES

Tall R Waves

- Right ventricular hypertrophy
- Right bundle branch block
- Right ventricular dominance
- Posterior wall infarction
- WPW syndrome.

ABNORMALLY WIDE QRS COMPLEX

Causes of wide QRS complex are:

1. Bundle branch block. (Right and left BBB)
2. Intraventricular conduction defect. (Cardiomyopathy, hyperkalemia).
3. Ventricular pre-excitation (WPW syndrome, LGL syndrome).
4. Wide QRS arrhythmias. (Supraventricular and ventricular arrhythmias) (Fig. 6.12).

T Wave

T wave is produced by ventricular repolarization and follows the QRS complex.

- It is upright
- Does not exceeds 5 mm in limb leads
- Does not exceeds 10 mm in precordial leads
- Considered most unstable component of ECG

INVERTED T WAVE (FIG. 6.13)

Following are the causes leading to inversion of T waves

Physiological States	→ Heavy meals, smoking, anxiety, tachycardia.
Extracardiac disorder	→ Hemorrhage, shock, pancreatitis pulmonary embolism, hypothyroidism.
Primary abnormalities	→ Hypokalemia, cardiomyopathy pericarditis, Coronary insufficiency.
Secondary abnormalities	→ BBB, WPW syndrome, ventricular hypertrophy

TALL T WAVE

Following are the causes of tall T waves

1. Hyperkalemia.
2. Myocardial ischemia.

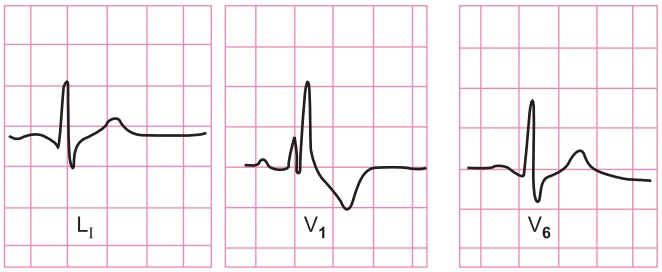


Fig. 6.12: Right bundle branch block: M-shaped complex in V_1 deep slurred S wave in L_1, V_6

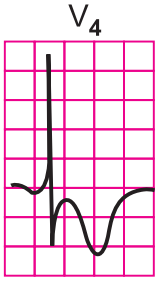


Fig. 6.13: Acute non-Q anterior wall myocardial infarction: Convex S-T segment; symmetrical, inverted T wave

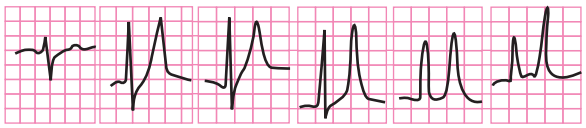


Fig. 6.14: Coronary insufficiency: tall, peaked T waves

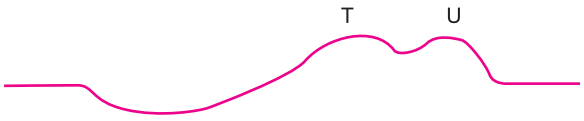


Fig. 6.15: Prominent U wave

3. Prizmetalis angina.
4. Coronary insufficiency (Fig. 6.14).

U Wave

- Produced by slow and late repolarization of the intraventricular Purkinje system
- Normally upright
- Much smaller than the T wave
- Often difficult to notice.

PROMINENT U WAVE (Fig. 6.15)

The causes of prominent U wave are

1. Cardiovascular drugs such as digitalis.
2. Hypokalemia.

INVERTED U WAVE

Reverse polarity U wave is called as inverted U wave

Following are the causes of an inverted U wave

1. Myocardial ischemia.
2. Left ventricular systolic overload.
3. Left ventricular diastolic overload (Fig. 6.16).

P-R SEGMENT

The portion of isoelectric line between the termination of the P wave and the onset of QRS complex is called the PR segment.

P-R SEGMENT DEPRESSION

Following are the causes of P-R segment depression

1. Sinus tachycardia.
2. Atrial enlargement.

Fig. 6.16: Inverted U wave

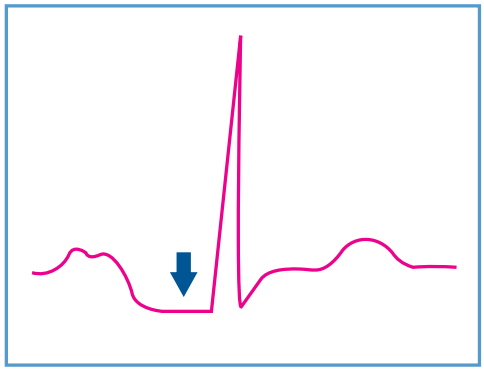


Fig. 6.17: P-R segment depression in atrial infarction as shown in the figure

3. Acute pericarditis.
4. Atrial infarction as shown in Figure 6.17.

S-T SEGMENT

The portion of the isoelectric line between the termination of the S wave and the onset of T wave is called the S-T segment.

S-T SEGMENT DEPRESSION (FIG. 6.18)

1. Heavy meals.
2. Anxiety.
3. Smoking.
4. Pancreatitis.
5. Pulmonary embolism.
6. Hypothyroidism.
7. Hypokalemia.
8. Cardiomyopathy.
9. Ventricular hypertrophy.
10. BBB.
11. WPW syndrome.

S-T SEGMENT ELEVATION

ST segment exceeding 1 mm in relation to the base line indicates S-T segment elevation as showning Figure 6.19.

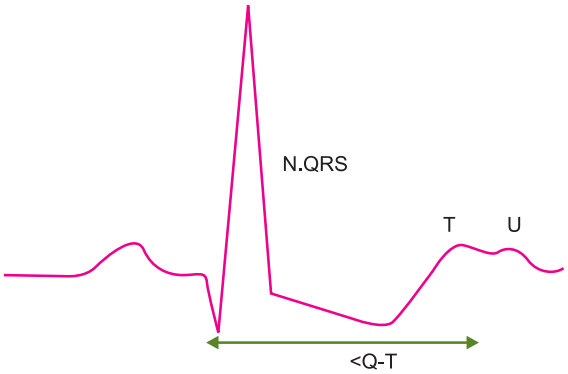


Fig. 6.18: Effects of digitalis on the ECG. There is depression of ST segment and 'T' is biphasic

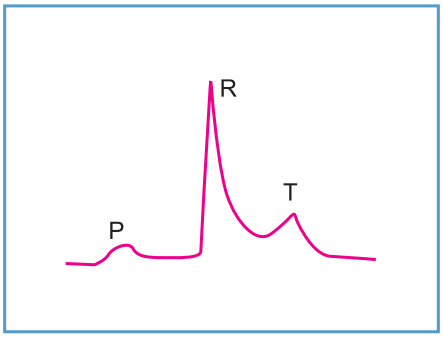


Fig. 6.19: Acute pericarditis: S-T segment elevation is concave upwards in cases of acute pericarditis

Following are the causes of S-T Elevation

1. Myocardial infarction.
2. Postinfarction syndrome.
3. Acute pericarditis.
4. Ventricular aneurysm.

P-R INTERVAL

P-R interval is measured on the horizontal axis from the onset of P wave to the begining of QRS complex.

P-R interval is slightly shorter in children.

Following are the abnormalities of P-R interval.

A. Prolonged P-R interval
- Vagal dominance in athletes
- Acute rheumatic fever.

B. Shortened P-R interval
- A-V nodal or junctional rhythm
- WPW syndrome.

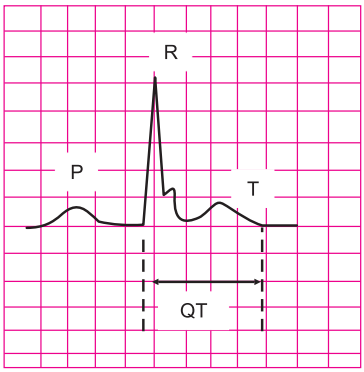


Fig. 6.20: Shortened Q-T interval: Hypercalcemia

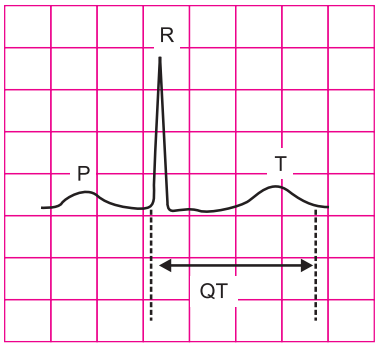


Fig. 6.21: Prolonged Q-T interval in the patients of hypocalcemia

C. Varial P-R interval
- A-V block
- Multifocal atrial tachycardia.

QT INTERVAL

QT interval is measured on the horizontal axis from the onset of Q wave to the termination of T wave.

Following are the abnormalities of the QT interval (Fig. 6.20).

A. Shortened QT interval
- Hyperkalemia
- Hypercalcemia
- Digitalis effect.

PROLONGED Q-T INTERVAL (FIG. 6.21)

- Mitral valve prolapse
- Hypocalcemia
- Myocardial infarction
- Acute myocarditis
- Brady arrhythemias.

Diseases of the Respiratory System 7

ANATOMY

Upper Respiratory Tract

Nose, paranasal sinuses, nazopharynx larynx.

Lower Respiratory Tract

Trachea begins at the cricoids cartilage and ends at the end of sternal angle and bifurcation into right and left main bronchi. Right is more vertical and foreign body most likely to lodge in that bronchus. It divides further into upper, middle and lower lobe bronchi put on the left two on the left all these are called "bronchial tree." Thus on right sides there are three lobes and left side two lobes. Each lobe composes of two or more bronchi pulmonary segments.

Each lung is closely inverted with visceral and parietal plural lining. The chest wall, mediastinum and diaphragm. These two layers are separated by a thin layer of lymph and between them there is a negative pressure and thereby the natural tendency of the lung is to recoil towards the hilum.

PHYSIOLOGY: FUNCTION RESPIRATORY APPARATUS

1. Ventilation oxygenation of venous blood.
2. Perfusion of venous blood from right ventrical.
3. Distribution of venous blood to all alveoli.
4. Diffusion exchange of O_2 and expel CO_2.

PATHOLOGY

1. Inflammation: Upper respiratory tract sinusitis, pharyngitis and laryngitis bronchitis and pneumonia.
2. Foreign body in trachea, bronchi and lung abcess.
3. Malignancy in the lung primary or metastatic.
4. Vantilatory.

Under ventilation: Bronchitis, emphysema, depression of respiratory center due to anesthesia or drugs, failure of respiratory muscles or chest deformities causes hypoxemia and requires O_2 supplement.

Over ventilation: Occurs in asthma, pulmonary embolism drugs such as salicylates over dose, anxiety, hysteria and metabolic acidosis.

COMMON MANIFESTATIONS OF RESPIRATORY DISEASES

1. Cough.
2. Production of sputum.
3. Hemoptysis.
4. Chest pain.
5. Dyspnea.

6. Wheeze.
7. Hypoxemia.
8. Hypercapnia.
9. Respiratory failure.
10. Clubbing.

They are well known and indicative of underlying pathology. Out of these the clubbing is found in the following disorders.

Lung cancer, chest pulmonary suppuration, pulmonary TB, cor pulmonale, infective endocarditis, cyanotic congenital heart diseases in Crohn's disease, cirrhosis of liver and sometimes it is familial or congenital.

Causes of Hemoptysis

1. Pulmonary: TB, bronchiectasis, lung abscess, cancer, pulmonary infections, pneumonia.
2. Cardiac: Mitral stenosis, pulmonary hypertension, left ventricular failure.
3. Hematological: Bleeding disorders, polyarteritis nodosa, granulomatosis.
4. How to differentiate from hemoptysis and hematemesis.

	Hemoptysis	*Hematemesis*
Reaction	Alkaline	Acid
Froth	++	Nil
Color	Red	Coffee color
Associated sym	Cough	Nausea

INVESTIGATION OF RESPIRATORY DISEASES

Physical Examination

Inspection

See nasal canal, adenoids, tonsils, nasal septum, deviation, and patch of diphtheria, temperature, respiratory rate, character of breathing, presence of cough, amount and character of sputum, cyanosis, clubbing, enlarged supraclavicular lymph glands, nasal discharge, oral sepsis, chest deformities funnel chest, kyphosis scoliosis lump in the breast, position of trachea and apex beat, if visible hoarseness of voice or nasal ting, in drawing of intercostals space habit of keeping mouth open, dryness of tongue.

Percussion and Palpitation

Confirm the tracheal position; compare the chest expansion during inspiration of either sides, vocal fremitus see for hyperresonance, normal or impaired dullness or stony dull, see vocal resonance.

Auscultation

Breath sounds normal vesicular or prolonged vesicular with prolonged expiration, diminished or absent high pitched bronchial, tubular or low pitched bronchial, presence of rhonchi low pitched, medium or high, crepitations fine, medium or coarse. Look for post-tussive succession and plural rub, which is audible during inspiration and expiration not affected by cough. Vocal resonance may be normal, increased, diminished or even absent and look for egophony and whispering pectoriloquy.

Recognition of these signs is an art and can be acquired by practice and their interpretation is the science to judge the underlying pathology and then co-relate.

Special Investigations

1. X-ray chest AP, right oblique and left oblique
2. Tomography, computerized axial tomography (CT scanning) most accurate but costly investigation.
3. Radio isotope scanning.
4. Fiberoptic bronchoscopy.

Laboratory Investigations

1. Examination of sputum for bacteria and acid fast bacilli for TB, culture and sensitivity test.
2. Complete blood picture total leucocytic count for eosinophilia.
3. ESR.
4. VDRL, HIV.

5. Serological exam for virus and allergic disorders.
6. Skin tests: Tuberculin test, Kwein test and allergy tests.

Endoscopy Tests

1. Laryngoscopy : Look for laryngeal paralysis and functional aphonia, and papilloma.
2. Bronchoscopy.
3. Bronchography.

Biopsies

1. Lymphnode biopsy.
2. Plural biopsy.
3. Lung biopsy.

Pulmonary Function Tests

Special apparatuses are used for estimating the ventilatory capacity; vital capacity, peak expiratory flow (PEF), forced expiratory time (FET).

These are very important to assess the functional capacity of lungs and serve the parameters for degree of recovery after treatment.

Pathology of Respiratory Diseases

Infectious

Bacterial: Staphylococci, streptococci, diphtheria, pneumonia, TB bacilli, anthrax bacilli, plague bacilli, etc.

Virus: Influenza, virus ABC, rhinoviruses, adeno viruses.

Fungal: Actinomycosis, nocardiosis, candidiasis, aspergillosis, histoplasmosis.

Parasites: *Cysticercus cellulosae, Paragonimus westermani*.

Eggs of *Schistosoma haematobium* and *mansoni*, *Strongyloides stercoralis* adult and larvae.

Allergic and occupational: Farmer's lung, bagassosis, woolsorter's disease, pneumoconiosis, asbestosis.

Malignancies such as bronchial carcinoma, bronchial adenomas, metastatic tumors from thyroid, breast, kidney, uterus, ovary, testis, prostate and GI Tract.

RESPIRATORY FAILURE

It is defined as inability of the respiratory system to carry out the normal O_2 transformation and CO_2 elimination.

It could even happen in normal lungs if respiratory center is depressed due to anesthesia or drugs such as morphine or barbiturates or even CNS pathology controlling respiratory activity or even disease of myoneural junction such as myasthenia gravis, or diseases of respiratory muscles such as progressive muscular dystrophy or obstruction to upper air way due to foreign body, thymoma, or aneurysm.

It could be due to lung pathology as chronic bronchitis, emphysema, status asthmatics and cystic fibrosis.

Management

It is a medical emergency to be attended by prompt therapeutic measures.

Clear the airways.

Start oxygen therapy if possible endotracheal inhalation. If available, artificial lung to be used to render O_2 pressure regulation.

Antibiotic umbrella is essential.

Steroids can prove life saving.

Close hospital care and symptomatic treatment is also important without say such as aspiration of accommodated sputum in the throat, etc.

INFECTIONS AND DISEASES OF RESPIRATORY SYSTEM

1. Acute coryza (common cold), sinusitis
2. Pharyngitis.
3. Laryngitis.
4. Tracheobronchitis, acute and sub-acute
5. Ch. bronchitis, bronchial asthma, emphysema.

6. Bronchiectasis.
7. Pneumonia.
8. Pleurisy and empyema, pulmonary edema.
9. Pneumothorax.
10. Pulmonary embolism.
11. Cysts and tumors of the lung.
12. Tropical eosinophilia.
13. Collapse of the lung.
14. Prospects and future of respiratory medicine.

Acute Coryza (Common Cold)

Viral infection of nasopharynx is superimposed by pyococci and *H. influenzae* causing sneezing, running of nose, headache and blocking of nose and fever. It is a virus infection. There is sore throat and occasionally dry cough may be complicated by paranasal sinusitis which is likely to become chronic requiring ENT specialist's surgical treatment.

Treatment

Rest, better to be away from duty and intimate contact, local nasal decongestant such as otrivin nasal drops in each nostril separately and inhale one by one. Clean, soft handkerchiefs keep separately and wash with antiseptic, analgesics such as paracetamol 500 mg tab 3 to 4 days. Antibacterial such as bactrim DS 1 tab bd 5 to 7 days.

Benzyl benzoate in boiling water steam inhalation once or twice a day for 2 to 3 days. Antiallergics such as cetirizine 1 tab od. Avoid deep breathing and physical exercision to avoid spread of infection to the lower respiratory tract usually the virus is short lived and immunity is specific for each virus with good management recovery within a week. Feed the cold by hot nourishing diet avoid fried, spicy, sour food and cold drinks. Better to drink warm water and hot saline water gargles give considerable relief.

Pharyngitis, Laryngitis Tracheobronchitis (Acute and Sub-acute), Acute Bronchitis and Influenza

The treatment policy will be the same but add tetracycline capsules 500 mgm tds, Phensedyl 1 TSF 3 to 4 times a day for about a week or a course of penicillin injections for 5 days. The viruses are short lived and no anti-viral drugs are used in practice.

Chronic Bronchitis

Etiology

1. Downward travel of infection from upper respiratory tract tonsils, nasal, sinuses and adenoids
2. Infection existing in lungs such as TB bronchiectasis.
3. Compression of bronchus due to malignancy or aortic aneurysm; or thyroid swelling.
4. Congestion of lungs due to CCF.
5. chest deformities, obesity, alcoholism and cigarette smoking are contributory important factors.

Symptoms

Cough, expectoration, dyspnea, fever and occasionally hemoptysis.

Signs

Expiration is prolonged, rales fine medium or course.

Treatment

1. Nasopharyngeal septic foci to be attended. Remove tonsils, adenoids, treat paranasal sinuses.
2. Omit smoking.
3. Expectorants.
4. Antiallergic, Cetirizine 1 tab od, phenergan 25 mg od.
5. Analgesics—paracetamol tab 500 mg tds.
6. Antibiotics such as tetracycline, ofloxacin.
7. Physiotherapy, respiratory exercises, inhalations and postural drainage.
8. Vitamins—Vitamin "A," "B" complex and vitamin "C."
9. Autovaccines to be prepared by culture of the sputum and also the sensitivity test.
10. Electro formulation–Ultraviolet, infrared or short wave diathermy.

Bronchial Asthma

It is characterized by paroxysms of dyspnea with wheezing due to bronchospasm caused by allergens in individuals with hereditary predisposition.

Incidence may be episodic or chronic. Not uncommon in children.

Clinical Features

There may be an aura, sneezing, tightness, anxiety, restlessness, sudden start of dyspnea and the patient fights for breath and feels suffocation and distress. The attack may remain for a few minutes to several hours called "status asthmaticus." There is cyanosis, hands and feet are cold, perspiration and apprehensive and air hunger, leans forward seeks support, head drawn back and shoulders raised, accessory respiratory muscles in action, wheezing heard at distance. Convulsions are common in children and syncope in adults.

Differential Diagnosis

1. Tropical eosinophilia.
2. Parenchymal lung diseases such as pulmonary TB, pulmonary infarction, pulmonary embolism, pneumothorax.

Treatment

It is very urgent.

1. Adrenallin 1/1000; 0.5 cc inj subcutaneously every half an hourly till the attack is controlled.
2. Aminophylline inj 0.25 gm slow IV diluted with 5 percent glucose 25 cc.
3. O_2 inhalation.
4. Pethidine 50 to 100 mg inj IM.
5. Antibiotic such tetracycline 500 mg inj IM, to be repeated 2 to 3 times a day for 2 to 3 days.
6. ACTH inj IV or cortisol tabs 25 mg 6th hourly for 2 to 3 days and then taper the dose before stopping.
7. Phenobarbitone 3 grain inj IM.
8. Anti-allergics such as phenergan 25 mg inj IM.

There is rapid relief as a result of the treatment and patient recovers from the attack of asthma satisfactorily.

Investigation and Diagnosis

1. X-ray of the chest and paranasal sinuses to exclude TB and miliary TB and infarction and sinusitis effusion may be suspected and diagnosed by aspiration.
2. Pulmonary function tests.
3. Skin susceptibility test for various allergens and preparation of autovaccine to be given subcutaneous injection in graded doses.
4. Complete blood pictures for eosinophilia and ESR.
5. Endoscopies and biopsy when needed.

Etiological Factors

1. Allergy.
2. Infections.
3. Emotional disturbances.
4. Environmental factors.

Attempts are required to be made to treat these cases of chronic asthma.

Pulmonary Eosinophilia

A group of following conditions can produce the syndrome

1. Tropical eosinophilia where circulating eosinophils are increased 40 to 50 percent and also the total leukocytic count.
2. Aspergillosis causing moderate increase in eosinophils and symptoms of asthma.
3. Eosinophilic pnemonia (Löffler's syndrome)
4. Polyarteritis.

In tropical eosinophilia the helminthes infestation is commonly found and treatment gives relief whereas in tropical eosinophilia the count of eosinophils is very high about 40 to 50 percent and supposed to be allergic reaction to microfilaria. It responds very well to benocide tab 50 to 100 mg 1 tab tds for few months (Table 7.1).

Table 7.1: Showing differences among bronchial and cardiac asthma and tropical eosinophilia

Factors	*Bronchial asthma*	*Cardiac asthma*	*Tropical eosinophilia*
Age	Any age	Middle age	Any age
History	Previous attacks	Hypertension CHD and BP high	History of previous attacks BP normal
Onset	Sudden	Insidious Related to exercise	Sudden Not related to exercise
Dyspnea	Starts with dyspnea	Cough followed by dyspnea	Dyspnea and then cough
Sweating	Rare	Sweating profuse	Sweating after some time
Fever	Nil	Nil	Present mild or moderate
Accessory resp muscles	More active	Not active	Moderately active
Expiration	Prolonged	Not prolonged	Moderately prolonged
Heart	Normal	Enlarged	Normal
Pulse	Feeble and rapid	Pulse full and abnormal	Pulse almost normal and may be moderately rapid
Eosinophils	Moderately increased	Normal	Highly increased with high leukocytes count
ECG	No changes	Abnormal	No changes
X-ray	Emphysema + Bronchial markings +	Heart enlarged	Emphysema+ and scattered course rolles mottling +++

This chart improves wether understanding for clinician and student

Polyarteritis is rare condition with moderate increase in eosinophils probably caused by hypersensitivity to sulpha pencillin or serum. Only relieved by corticoid therapy.

Emphysema

Over distention of pulmonary alveoli due to chronic obstructions, pulmonary disease (COPD). Clinically there is exertional dyspnea usually as a sequel of ch. bronchitis or asthma. This is a progressive respiratory disability. Causing morbidity affecting patients' lifestyle goes on for years.

Physical Signs

Increase in anteroposterior diameter of the chest in relation to the lateral diameter called "Barrel Chest." Ribs more horizontal subcostal angle obtuse, reduction of size of trachea palpable above the sternal notch descending with inspiration, contraction of sternomastorid muscles on inspiration, excavation of suprasternal and supraclavicular fossa during inspiration, jugular venous feeling during expiration, and also costal margins, during inspiration, obliteration of hepatic dullness, vital capacity diminished and there is polycythemia X-ray shows translucent lung fields with loss of peripheral vascular markings and flattening of the dooms of diaphragm. Pulmonary functions are diminished, weak breath sounds, short inspiration and prolonged expiration diminished vocal resonance and few scattered rales.

Complications

1. Ventilatory failure.
2. Pulmonary hypertension.
3. Right ventricular failure.

4. Polycythemia and episodes of thrombosis.
5. Spontaneous pneumothorax.

Update Treatment of Ch Bronchitis, Ch Asthma and Emphysema

1. Prevention of bronchospasm and attacks of asthma by inhaling corticoids and broncodilators
   i. Aerocort inhalar (Cipla)
   Contains solbutomol sulph 100 meg + beta methasone 50 mg 2-3 puffs 3 to 4 times a day
   ii. Asthalin inhalor (Cipla)
   Only solbutamol dose an above.
   iii. Becalate inhalar (Cipla)
   Only betamethasone dose as above.
   iv. Bricanyl inhaler (Astra Zeneca).
   Only tolbutaline sulph dose as above.
   v. Cronial inhalor (Cipla) dose as above
   These inhalers are for preventing the asthma attacks and should be associated with oral tablets in adults and liquids and syrups for children along with expectorants.
2. Tablets to be consumed for preventing bronchospasm
   i. Albutamol tab (Centaur).
   ii. Akyoebt tab (German Remedies).
   iii. Asmapax depot tab (Nicholas Peramel).
   iv. Asthalin tab (Cipla).
   v. Bambudil tab (Cipla).
   vi. Ketadima tab (Sun Pharma).
   vii. Mucoline tab (Cipla).
   viii. Solbetol tab (FDC).
   All these tablets to be given twice or thrice a day depending upon age, weight and severity of the disease in the patient.
3. Liquids and syrups for children and senior old patients:
   1. Bronchilet liquid (Nicholas Peramel).
   2. Ehixlir cadiphylate liq (Zydus Sbidac).
   3. Asthalin expectorent liq (Cipla).
   4. Corex syrup (Pfizer) and also Corex Dx.
   5. Grilinctus syrup (Franco India).
   6. Zedex syrup (Wockhardt) dose—½ to one TSF three to four times a day as maintenance associated treatment.
   7. Zeet expectorant syrup (Alembic).
   8. Turpel syrup (Indico) and also phenergan syrup.
4. Injections when quick relief is desired.
   1. Deriphylin 200 mg IM (German Remedies).
   2. Etyofil 200 mg IM or IV (FDC).
   3. Aminophyllin 0.25 gm IV (slow) diluted with 5 percent glucose 15 to 20 cc.

Corticosteroids

Hydrocortisone is the natural hormone of the adrenal cortex having anti-allergic, anti-inflammatory, anti-fibroblastic and anti-exudative qualities.

Following compounds are used in practice depending upon their needs:

A. Hydrocortisone acetate available in aqueous suspension form absorbed slowly, locally effective and negligible systemic effect.
B. Dexamethasone is very potent with rapid action and gives prompt relief but it causes pituitary adrenal suppression and fluid retention, hypertension.
   - Inj Apridex 2 ml 4 mg/ml (Indus)
   - Deca forte tab 10 mg (Merind)
   - Inj Dexamit 4 mg/ml 2 ml vial (NEM Lab)
   - Dexarich 0.5 mg tab (Richlyns Health Care).
C. Betamethasone is more potent and can cause dramatic improvement and is considered life saving but for side effects of sub-capsular cataract glaucoma, osteoporoses, peptic ulcer, hypertension and psychic instability.
   Preparation:
   - Tab Betacortril 0.5, 1 mg (Pfizer)
   - Tab Betnelan 0.5, 1 mg (Glaxo Smith Kline)
   - Tab and inj Betnesol 0.5, 1 mg and oral drops (Glaxo Smith Kline)

- Tab, Inj and drops—Celestone tab 0.5 mg, inj L/Ril drops 0.5 mg/ml (FulFord)
- Cortil tab 0.5 mg (Micro Lab)
- Nucort oral drops 0.5 mg/ Ml (Mankind).

D. Fludrocortisone acetate is used as a replacement therapy in aderenocortical deficiency such as in Addison's disease.

E. Prednisolone is a very potent drug than hydrocortisone with advantage that the fluid retention does not occur and has got less pituitary adrenal suppression and therefore, is a better choice.

Disadvantage of delayed healing of wounds must be kept in mind and also psychosis.

Preparations:

- Tab Deltacortrid 0.5, 1 mg (Pfizer)
- Inj Depo-medarol 40 mg/ml 2 ml vial (Pharmacia)
- Syrup Predone 5 mg/5 ml (Cipla)
- Wysolon 5,10,20,30,40 mg tabs (Wyeth Laderle)
- Inj unidrol 40 mg/ml 2 ml vial (Unichem).

F. Triamcinolone is slightly more potent than prednisolone and there is no fluid retention. The disadvantage being loss of appetite, muscle wasting and mental depression.

Preparations:

- Inj Comcort 10-40 mg/ml (Comed)
- Tab Ledercort 4 mg (Wyeth Laderle)
- Tricort tab 4 mg, inj 10 to 40 mg/ml (Cadila).

G. Hydrocortisone sodium succinate is a rapidly acting drug but acts for short duration.

Side action peptic ulcer, and it interacts with phenytoin, barbiturates, rifampicin

- Tab recortin 20 mg (Chemo Biological)
- Inj lycortin S 100 mg vial (Lyka)
- Inj primacort 100, 200, 400 vial (Macleorld).

The choice of corticosteriod preparation depends upon age, weight, and seriousness of the disease and convenience of administration. High dose requires gradual reduction and maintenance of treatment, if prolonged. The side actions must be kept under strict vigilance, changes in behavior of the patient can occur due to psychic effects and depression due to drug which should be remembered. Do not stop drugs abruptly but taper it slowly for long period of 2 to 3 weeks before completely omitting it.

Its use requires to be judicious and not as a routine practice. It is a powerful potent and a miraculous therapeutic instrument that deserves to be kept at hand for serious emergencies as for as possible.

Bronchiectasis

It is a localized, irreversible, abnormal, dilatation, distension and distortion of bronchi causing repeated infection and some times hemoptysis.

Etiology

A. Congenital
B. Acquired

A. Congenital anomaly in few bronchi causes this condition.

B. Partial occlusion causing accumulation of infected material mostly coming for the upper respiratory tract, even blockage can be due to foreign body or pressure from outside due to malignancy or aneurysm or patch of unresolved pneumonia, collapse of lung, TB or plural pathology.

Symptoms

Same as bronchitis added with copious hemoptysis, and clubbing of fingers and toes, disturbing cough with large expectoration.

Complications

Pneumonia, lung abscess, gangrene, pleurisy, empyema, pericarditis, septicemia, pyrexia, brain abscess, amyloid disease, ch. pulmonary osteoarthropathy.

Treatment

Postural drainage, bronchoscopic aspiration, antibiotics, expectorants, blood transfusion if indicated and surgery when essential and required.

Pneumonias, Lung Abscess and TB

Consolidation of one or more lobes of lung due to infection caused by bacteria or virus called acute lobar pneumonia.

Clinical Features

On set sudden, rigors, high fever and convulsions in children, headache bodyache, localized chest pain and painful cough with rusty tenacious sputum. Pulse is rapid, cyanosis may be seen. There may be herpes labialis.

Physical Signs

Respiratory movements diminished, impairment of percussion note, pleural rub may be heard. Breath sounds are high pitched and bronchial course crepitations. If pleurisy develops the pleural rub disappears and stony dullness appears on percussion

Investigations

X-ray chest, sputum exam, blood count, ESR.

Treatment

Chemotherapy, O_2 inhalation, expectorants, analgesics, antiallergic and careful nursing, light but nourishing diet and complete rest till full recovery and specific treatment if there is TB, or pleurisy, empyma, shock and malignancy, treat accordingly.

Lung Abcess

Causes

1. Aspiration of foreign material specially during anesthesia before surgery.
2. After lobar pneumonia, bronchopneumonia, bronchiectasis.
3. Septic embolism in pyemia.
4. Metastatic malignancy secondarily infected.
5. Pulmonary infarction.
6. Pulmonary atelectasis.
7. Fungal infections such as actinomycosis superimposed with bacterial infection.
8. Infection spread from surrounding structures directly.

Signs and Symptoms

Same as bronchiectasis.

Investigations

X-ray, blood count WBC above 20,000, sputum exam, culture and sensibility test bronchography; bronchoscopy; CT scanning of chest.

Treatment

Postural drainage, bronchoscopic aspiration, O_2, chemotherapy, hospitalization, careful nursing, nourishing light diet. Symptomatic treatment for pain, fever, anxiety, surgery when needed.

Pulmonary TB

Predisposing causes: Environmental, overcrowding, lack of ventilation, improper nourishment, stress and strain associated other diseases such as diabetes, HIV, syphilis, upper respiratory septic foci and chronic disorder, lowering the resistance of the individual, occupational circumstances.

Etiology

There are three types of tubercle bacilli.

A. Human type.
B. Bovine type.
C. Avian type.

Transmission is by ingestion or inhalation. No sooner tuberculosis bacilli enter the body, it stimulates the immune system and if the immunity is adequate it counteracts and overcomes the infection and if it is inadequate, the bacilli causes

caseation locally and in the lymph nodes of that region to be mediastinal, cervical, mesenteric.

If healed, they are calcified. If not, the infection is progressive and can disseminate through circulation causing miliary tuberculosis, TB meningitis. Locally characteristic features are cavity formation as the caseated material is liquefied and exporated. Lymphatic spread may cause pleurisy and empyema. If blood vessel is infected and damaged, there could be copious hemoptysis.

Certain individuals show allergy and hypersensitivity to the infection and clinically produce an acute syndrome with pleurisy and pericardial effusion, fever, headache, bodyache, rigors and convulsions in infants and small children. But the disease may remain active even though there are no constitutional symptoms.

Signs and Symptoms Depend upon the Site of Infection

Tongue: Ulceration.
Upper respiratory tract: TB adenoids and tonsils and cervical glands.
Larynx: Hoarseness of voice and dysphonia.
Lungs: Cough with sputum, dyspnea, hemoptysis.
Intestine: Diarrhea, malabsorption, downy abdomen, ascites even obstruction
Pericardium: Pericardial effusion later constructive. Pericarditis and kidney, bladder, testis, ovary all cause swellings and disturbed functions.
Brain: Tuberculomas and damage to surrounding brain tissue and meningitis.

Lymph nodes can cause cold abscess and chronic sinus formation.

Adrenal glands can cause Addison's disease.
Skin: Lupus vulgaris, erythema, nodosum.
Eye: Keratoconjuctivitis, iridocyclitis and choroiditis.

Treatment of Tuberculosis

Fortunately, we are armed with anti-tuberculosis, chemotherapy and most potent and powerful adjuvant of carticosteroid which can provide dramatic improvement in emergencies.
The chemotherapeutic drugs are as follows:

1. Streptomycin bactericidal but organism becomes resistant by long use.
2. Rifampicin highly bactericidal.
3. Isoniazid more active with combination of other drugs.
4. PAS (Pyrazinamide) anti-bacterial but TB germs become resistant by long use.
5. Ethambutol inhibits the growth of TB organisms.

Other drugs required as second line treatment:

6. Cycloserine
7. Ethionamide
8. Prothionamide.

Preparations used in practice are as follows:

1. *Streptomycin*
   A. Ambistryn S 0.75, 1 gm vile (SPPL Ethical Div)
   B. Merrtrep1 gm vile inj IM (Merind)
   Doses: 1 gm/day 2 to 3 months in severe cases of TB followed by 1 gm, two to three times a week for remaining period of treatment.
   Avoid in diseases of ear and labyrinthine disturbance and in pregnancy.
   It is apart from TB it is a drug of choice in plague. Tularemia, brucellosis, sub acute bacterial endocarditis.
   Never use unless skin sensitivity test is done and avoid it if patient is sensitive.
2. *Rifampicin*
   Dose: 50 mg/kg/day up to 600 mg.
   Adverse effect on liver to be watched.
   Contraindicated in pregnancy, murasmus and undernourished.
   Always use with other anti-TB drugs.

   Preparations:
   1. Rifacept 450-600 mg cap (Concept)
   2. Rifamycin 450 mg cap (Biochem)

3. Rimphacin 450 mg cap (Cadila-H)
4. Rimpin 450 mg cap (Lyka)
5. CX-3 rifampicin 450, 200, 300 mg tab (Alde)
6. Deunex R 450, 200, 300 mg tab (Alde).
   Kid tab R 100 + Iso 100 tab (Alde).
7. Docina kid R 100+ ISO 250 as tab (Ashok Pharma).
8. Montonex kid R 100 + ISO100 tab (Plethico)
9. Rifa kid forte R 200 ± I 150 tab (Concept).

3. *Isoniazid*

More effective on TB bacilli than streptomycin and PAS.

Dose: 300 mg/day caution to be exercised in liver disease, alcoholism and epilepsy.

Side effect: Peripheral neuropathy, mental disturbances, convulsions encephalopathy.

Preparations:

1. Embazide tab 400 mg (Mac).
2. Isonex 100 to 300 mg (Pfizer).

Any hepatic or neurological symptoms found, reduce the dose and watch. (specially in children and elderly patients).

4. *Pyrazinamide (PAS)*

It is analog of nicotinamide it is effective but soon bacteria becomes resistant. So, it should be used in combination with other anti-TB drugs.

Side effects: Arthralgia, anorexia, nausea, vomiting, dyspnea and gout.

Dose: 20 to 35 mg/kg maximum 3 gm/day watch serum uric acid during treatment.

Preparations:

A. Montozin 500-750 mg tab (Plethico)
B. P-Zide 100 mg tab (Cadila)
C. Pyz 500-750 tab (Life Line BioTech)
D. Pyzina (Lupin)
   Kid – DT 300, 500, 750, 1 gm tab
E. Tibimide 500 to 750 mg tab (Themis)

5. *Ethambutol*

It inhibits the growth of TB organism. It is to be used in combination with other anti-TB drugs.

Dose: 15 mg/kg as a single daily dose for 60 days.

Side effect: Retrobulbar neuritis, blurred vision and diminution of color vision.

Preparations:

A. Combutal 200, 400, 600, 800, 1000 mg tab (Lupin).
B. Koxi 400, 600, 800, 1,000 mg tab (Plethico).
C. Ly-butol 800, 1,000 mg tab (Lyka)
D. Myambutol 200, 400, 600, 800, 1000 mg tab (Wyeth Lederle).

If culture and sensitivity test shows that tuberculosis bacilli are resistant to all the above five groups of drugs, you have to embark upon other drugs mentioned below as second line of treatment. Sometimes the patient gets the infection from such resistant organisms and therefore, culture and sensitivity test is a must.

6. *Cycloserine*

Used as second line of treatment dose 15 to 20 mg/kg or 500 mg twice a day. Contraindications, epilepsy, psychosis, depression, renal failure and alcoholics, pregnancy and use with caution in children and elderly patients.

In combination with isoniazid may increase the CNS side effects.

Preparations

A. Coxerin 250 mg cap (Macleods)
B. Cyclorin 250 mg cap (Lupin)
C. Myser 250 mg cap (Panacea)

7. *Ethionamide*

Is a bacteria static agent to be used in combination.

Contraindication: Liver damage.

Dose: May be reduced in children and elderly patient when necessary.

A. Ethide 250 mg tab (Lupin)
B. Ethiocid 250 mg tab (Themis)
C. Ethiomid 250 mg tab (Mac Leods).

8. *Prothionamide*

Second line of treatment to be used in combination with other drugs.

Preparation:

A. Prothiocid 250 mg tab 1 bd (Themis Medicare).
B. Protomid 250 mg tab one bd (Macleods).

Therapeutic Combination of TB Drugs

1. *Combination of ethambutol and INH*
   A. Combutol H Eth 800 + INH 300 tab one per day(Merind).
   B. Combunex Eth 800 + INH 300 tab one per day (Lupoin).
   C. Isokoxi Eth 800 + INH 300 tab one per day (Plethico).
   D. Myconex Eth 800 + INH 300 tab one per day (Cadila).
   E. Themibutol Plus Eth 800 + INH 300 tab one per day (Themis).
2. *Combination of rifampicin + INH + PAS*
   A. AKT-3 (Lupin) (Each Strip one od) Rif 450 + INH-300 mg + Ethi 800 m.
   B. AKT-4 (Lupin) (Each Strip 1 od) Rif 450 + INH-300-PAS 500 + Ethi 800.
   C. AKT FD (Lupin) for children 1 od Rif 150+ INH 100 – PA 500 +Ethi 267.
   D. Anticox-3 (Unicem)– Combipack – Rif 450-INH-300 + Ethi 800.
   E. Anticox-3 Combipack 1 per day Rif 450 + INH-300+ Ethi 800.
   F. Cavicin E Kid—Combipack – Rif 450 –INH 300 +1500 PAS.
   G. Confez – 3 Combipack one per day. Rif + 1 + Pyridexin 10 mg Ethi 500 (Plethica).
   H. CX-3 R+1+P4 (Cadila) CX-4 R +1+P4 (Cadila) + Ethi 800.
   I. Montorip (Plethica) for children R150 + 100 + PAS 500 cap one per day.
   J. Montorip Forte for children R 225+1150+PAS 750 tab one per day.
   K. Rinizid R 150 + I 100 + tab 375 (Lupin) for children one per day.
   L. Rinizid Forte DT R 150 + 1150+QAS 500 (Lupin) one per day.
   M. Rokokit R 450+Inh 300 +Ethi 800+ PAS 500 (Themis) one per day.

Therapeutic Policy of TB Treatment

1. Change of environment, sanatorium treatment in advanced cases is referred.
2. Complete rest and nourishing diet.
3. Treat anemia, vitamin deficiency, anxiety, anorexia, and insomnia symptomatically. Iron deficiency does not respond to the oral therapy and it is required to be given by intra- muscular injection of Imfaron or Jagtofur 2 cc every alternate day. 8 to 10 injections as required and assessed by HB estimation.
4. Treat associated diseases such as diabetes, hypertension, cardiovascular disorders.
5. Attend septic foci in upper respiratory tract and mouth.
6. Send the sputum for culture and drug sensitivity tests.
7. Omit any drug to which bacilli are resistant and replace by those to which TB Bacteria are sensitive.
8. Start streptomycin inj after skin test if patient is not sensitive.
9. CX-5 one strip per day for two months after that CX-4 one strip daily for four months. Then after that CX-3 one tablet daily for 7 to 8 months. Finish all the required investigations immediately and repeat them every 2nd to 3rd week.
10. Start streptomycin injections 1 gm daily (only after skin test) for 60 days and then 1 gm 2 to 3 times a week till the end of the treatment.
11. Assess every 2 to 3 weeks by repeating all the investigations and decide about his ambulatory, home treatment and see that the rehabilitation has been properly done to avoid recurrence.

If the experts decide surgery, it may be carried out keeping safety margins intact. Also test the relations in contact for TB infection. Compulsory

annual health checks to be insisted even after complete recovery.

Pleurisy

Plural sac invaginate the lungs to facilitate the chest movements. When it gets infected it is called "pleurisy."

It is a common feature of pneumonia pulmonary infarction, pulmonary tumor or pulmonary TB.

Clinical Features

In dry pleurisy there is plural pain, restricted chest movements and breath sounds are not audible the plural rub during inspiration and disappears when breath is held and when near pericardium pleura pericardial rub is heard. All other clinical features depends upon the underlying pathology. May result in either complete recovery or plural effusion.

There is cough, purulent sputum, fever which may or may not be helpful.

The X-ray of chest may or may not be helpful. It is to be distinguished from pleurodynia fracture rib, costochondritis, herpes zoster spontaneous pneumothorax and acute upper abdominal disease.

Treatment

Treat underlying cause give symptomatic treatment.

Pleural Effusion and Empyema Thorax

When the serous fluid accumulation in pleural cavity it is called pleural effusion. When passive transudate, it is called hydrothorax and when passive accumulated fluid treatment it is called hydrothorax

Commonest cause is pulmonary TB, pneumonia, malignancy, infarction of lung and underlying pulmonary diseases. Effusion is usually bilateral. It may be the manifestation of systemic lupus erythematous. Rheumatoid disease and mediastinal and malignant lymphomas or sub-diaphragmatic abscess.

Clinical features are the same as a dry pleurisy ends in either recovery or effusion. Symptoms of primary underlying diseases are always present. Such as cough, dyspnea, chest pain, nausea, loss of appetite and feeling of unwell, anxiety and loss of sleep. All these are treated symptomatically.

Investigations

X-ray chest shows uniform dense opacity, lab investigation of CBC, ESR and examination of aspirated fluid may provide helpful guidance for treatment.

Pleural biopsy and sputum, examination is also significant in reaching to the diagnosis.

Treatment

Aspiration, treat the underlying disease and give symptomatic treatment and O_2 when necessary. Addition of carticosteroid to the chemotherapy gives dramatic relief to the patient specially in emergency.

Spontaneous Pneumothorax

There is a negative pressure in pleural cavity, which helps lung expansion. When air enters there is atmospheric pressure and lung collapses causing an acute syndrome called penumothorax. Air may enter in pleural sac by bursting a sub-pleural TB focus in lung or emphysematous bulla rarefy by fractured rib which may puncture pleura or from mediastinal malignancy.

Symptoms onset is sudden. There is discomfort, severe chest pain, shortness of breath, blood stained sputum, and cyanosis, condition is serious enough to cause death due to asphyxia and cardiac failure.

Signs

Diminished chest expansion on affected sides.

TVF absent, trachea displaced, hyperresonant chest (Cardiac dullness abolished), breath sounds absent

Types of Pneumothorax

1. Closed when communication is sealed off and lungs are gradually expanded and air in the pleura is absorbed.
2. Open when communication is established with bronchus and does not seal off. Infection from bronchi travels down and there is a empyema.
3. Valvular the communication is one way and air in pleural cavity due to valvular inlet and pressure in pleural cavity is above atmospheric. The lung gets completely collapsed and the condition of the patient is utmost disastrous, due to shifting of media stinal structures to the other side. It is called as "tension pneumothorax."

Clinical Features

It is a medical emergency as there is severe pain and progressive compressed feeling in the chest. There is severe breathlessness; cyanosis and patient may die due to asphyxia within a short time.

An intercostals catheter to be inserted in pleural cavity at once and air pressure is relieved and it is connected to a water seal drainage system. Relief is dramatic. If it is not possible to undertake this remedial measure, it is enough to puncture the pleura by wide bore needle connected by rubber tube in the water bottle half filled.

Treatment

Aspiration of air is a most important factor. Treat pain by inj pathedrin 100 mg IM O_2 inhalation anti-TB drugs, antibiotics, antiallergic and keep patient in erect position to be twisted on affected side strapping of chest may be done if there is no tension in pneumothorax. Possibility of recurrence cannot be ignored and therefore, all possible investigations to get done promptly so that effective treatment can be installed immediately.

Pulmonary Embolism and Infarction

A blood clot from right side of the heart blocks the pulmonary trunk completely or partially causing the syndrome of pulmonary embolism and if it blocks a smaller pulmonary artery it is called *"pulmonary infarction."*

Etiology

Thrombus can come from deep veins of the legs or in the right atrium especially when there is fibrillation and CCF, mitral stenosis, myocardial infarction.

Clinical Features

Massive pulmonary embolism causes intense pain with compressive feeling, intense dyspnea, cyanosis, shock and death may occur in a few minutes may give more time few hours or even a day or two. The BP falls, P2 is accentuated. There is tachycardia and syncope.

In case of pulmonary infarction, there is sudden, severe pleuritic pain, hemoptysis, tachycardia, dyspnea and cyanosis, fever and WBC Lucoytosis is present.

X-ray may not be helpful except ipsilateral elevation of doom of diaphragm but pulmonary angiographies are diagnostic and helpful in emergency surgery of embolectomy or thrombolytic therapy.

ECG shows diagnostic pattern where there is right axis deviation inversion of "T" wave in the right ventricular leads and RBB.

Differential Diagnosis

Myocardial infarction, dry pleurisy.

Treatment

Anticoagulants heparin 10 to 15,000 units IV followed by oral therapy.

Thrombolytic drugs urokinase.

Inj of morphine or path dine 50, 100 mg inj IM O_2 inhalation.

For prevention of recurrence, low dose of heparin 5,000 units subcutaneously 8th hourly even before and after the contemplated surgery, antibiotic

umbrella is a must in adequate doses for reasonably long period along with hospitalized general treatment.

Digitalis if right ventricular failure.

Anticoagulants Update

Heparin a powerful, prompt acting anticoagulant act by activating plasma or antithrombus factors inactivates them and thereby the conversion of prothrombin into thrombosis is delayed and plasma clotting time is increased on one hand which inhibits the conversion of fibrinogen into fibrin on the other. Thus it is most suitable for use in such situations.

Dosage: 5 to 10,000 units 6 to 8 hourly deep sc, proportionately lower dose in children.

Contraindications: Bleeding disorders, thrombocytopenia, severe hypertension, threatened abortion piles, malignancies, TB and never with aspirin and other platelet drugs.

Preparations Used in Practice

A. Beparin inj 1 to 5000 IU/ml 5 ml vial (Biological E).
B. Heparin Inj 5 to 25000 IU/and viles (Gland Pharma).
C. Heplock 5 to 10 ml viles (Gland Pharma).
D. Lomorin 2-4-6000 Ampules (VBH).

Dalteparin sodium second line drug; helpful in thrombophlebitis.

Dose: Inj 120 IU/kg, subcutaneously.

Contraindications: Hemorrhagic diseases, SBE, hypertension, diabetic ratinopathy and pregnancy.

Preparations Used in Practice

A. Inj Fragnin 2,500 and 10,000 inj sc/daily (Pharmacia).

Reviparin sodium Second-generation heparin with narrow molecular weight used as prophylactic in deep vein thrombosis with low risk.

Dose once a day 0.2 ml inj sc (Knoll).

Preparations Used in Practice

Clivarine 0.25 ml sc (Knoll).

Enoxaparine is low molecular weight heparin increases clotting time lesser than heparins.

Indications: Prevention of deep vein thrombosis and pulmonary embolism.

Precautions: In hepatic insufficiency, peptic ulcers, pregnancy and hemoptysis disorders never give IM inj.

Preparations Used in Practice

A. Fraxiparine—3075, 4100 IV 3 to 4 ml vials inj iu sc (Sanafi Torrent).
B. Fluxin 3200, 6400 IU 0.3 to 0.6 ml inj sc (USV).

Coumarins and indanediones: Inhibits vitamin K

Indication: Venous thrombosis, pulmonary embolism.

Contraindications: Hepatic and renal insufficiency, pregnancy, peptic ulcer, hypertension.

Preparations Used in Practice

A. Acitrom 50 mg tab 1 od (SPPL)
B. Dindevan 50 mg tab 1 od (Biological E)
C. Uniwarfin 1, 2, 5 mg tab 1 od (Uni Search)

Plasminogen activators: Acts better in combination with streptokinase and urokinase.

Indication: Coronary thrombosis, MI.

Dose: 100 mg IV slow in 3 hours preferably given in infusion.

Preparations Used in Practice

A. Actilase inj 50 ml vial inj + 50 ml solvent IV drip in 3 hours.

Streptokinase Causes Thrombolysis

Indication: Acute heart attack, pulmonary embolism, deep venous thrombosis.

Dosage: IV 750,000 (1.5 million) IU.

Side effects: Hypotension, arrhythmias, fever and hemorrhage.

Preparations Used in Practice

A. Kabkinase inj (0.75)–750,000 IU vial (Pharmacia).
B. Strep Life 7.50 lacs vial and 15 lac IUL IV inj slowly (Life Medicare).
C. Thrombosolv inj IV 750,000 and 1500 000 IU vials (VHB).
D. Zykinase 7.5 MIU and 15 MIU vials IV (Cadila – H).

Urokinase Enzyme from Human Urine

Indication: As above

Dose: 0.25 mg/kg in one hour (slow inj)

Preparations Used in Practice

A. Medinase inj IV 2.5 l and 5.00 l vials (Life Medicare).
B. Uni Kimin inj 25,0000, 500,000, 750,000, 100,000, IU/ml viles (Unichem).
C. Urokinase 20T- 1000 T IU vials (Win Medicare).

Abciximab: Which inhibits platelet aggregation.

Contraindications: Hemorrhagic disorders, hypertension, malignancies.

Preparations Used in Practice

Recopro inj 2 mg in 5 ml vial (Eli Lilly).

Cysts and Tumors of the Lung

Commonest in bronchial carcinoma, benign tumors are rare metastasis tumors from breast, kidney, ovary testis, prostate, uterus, kidney thyroid G.I. Tracts are seen. Sarcoma estrogenic or met static invasion of mediastinal tumors including lymphomas and cysts and pressure of aneurysm.

Age 40 to 55 sex: Four times more common in males, predisposing factors smoking and radio active dust from cobalt mines, onset gradual, persistent cough, hemoptysis and signs and symptoms of bronchitis, asthma, exertional dyspnea, hiccups, dyspepsia, loss of weight, progressive weakness signs and symptoms of consolidation, effusion and mediastinal obstruction develops.

Diagnosis

Sputum for maliganant cells.

Blood exam CBC, ESR.

X-ray chest: Tomography, bronchography, biopsy, CT, scanning all are very helpful.

Treatment

Hospitalization in Chest Institute, symptomic, chemotherapy, O_2, surgery under expert guidance. In case of metastasis attend the primary sites. In advanced cases clubbing, cyanosis and pulmonary osteoarthropathy and Horner's syndrome (in which myosis due to paralysis of sympathetic at C8 and T1 level).

Occupational Lung Diseases

Pneumoconiosis: In which there is fibrosis of lungs due to prolonged inhalation of coal dust.

Silicosis: Due to prolonged inhalation of sand, dust, granite, pottery industries or working in tin, gold and other mines.

Asbestosis: Pulmonary fibrosis occurring in laborers working in asbestos industries.

Byssinosis fibrosis lung: Due to inhalation of cotton fibers.

All other diseases cause extensive allergic alveolitis, fibrosis, ch. pulmonary loss of function and often start superimposing TB and other bacterial infection ultimately leading to cor pulmonale right ventricular failure and death.

Future Prospectus of Respiratory Medicine

Chemotherapy is advancing to overcome the resistance of infective organisms and the prospects are bright in reducing the mortality and morbidity.

Advanced surgery is marching towards removing the affected lung portion leading towards shortening the therapeutics lengthy courses of treatment giving the gift of cure.

Advanced methods of diagnostic Armamentarium are shortening the delay in diagnosis thus

reducing the period of suffering of the pulmonary patients.

Improvement of environmental pollution will take quite long time to overcome the factors, which requires basic need of population control to over come the unemployment problem sothat the standard of living as well as improvement in ventilation and nourishment will increase the resistance of the patients. Thus, the outlook will be brighter.

Unemployment and overcoming the deficiencies of nourishing food is optimistic due to WHO efforts all over the planet with special attention to the underdeveloped countries.

Gastrointestinal Diseases 8

DISEASES OF ALIMENTARY TRACK AND PANCREAS

The Word "Aliment" means food or nutritive material. Thus, the system is called alimentary track or diseases of digestive or gastro-intestine system. The primary concern is with intake, digestion absorption of nutrient material, and conversion into body utilizable pattern for use or store.

The functions of the system are thus outlined as above, but there are accessory functions, which requires to be known.

1. Storing of the food.
2. Pushing forward the food.
3. Excretion of unabsorbed material.
4. The defensive mechanism and immunological properties.
5. To house microorganisms, which are symbiotic.
6. Mucosal barrier which prevents entry in the body from the lumen of intestine.

All these processes take place in the following ways:

1. Motility controlled by autonomic nervous system and also by hormones (gastrin, secretin, cholecystokinin and pancreozymin).
2. The motility made for pushing straight forward to the track controlled by sphincters upper and lower esophageal and annal.
3. Secretion of enzymes to digest the food.
4. Absorption from gastrointestinal track and then it reaches liver through mesenteric veins and lymphatics.
5. Defense mechanism from enzymes doing autodigestion and bacteria by engulfing by mucus.

IMPORTANT SYMPTOMATOLOGY OF ALIMENTARY TRACK

1. Halitosis (Bad breath): Due to putrefying food particles in between the teeth, sinusitis, tonsillitis, excessive smoking, lung abscess, dry mouth and pyorrhea.
2. Belching, eructation: It is due to gas in the stomach, aerophagy, fermentation of food due to pyloric stenosis, psychiatric, infectious diseases.
3. Hiccup (Singueltus): Important symptom causes due to twitching of diaphragm or may be due to diseases of central nervous system, GI tract, renal diseases, psychiatric neurosis, and infectious diseases.
4. Heart burn (Pyrosis): It is usually retrosternal due to reflux of stomach content in the lower part of the esophagus,

alcohol, aspirin, nasal secretions, chilies, sour foods and fruits and after heavy meals.

5. Flatulence and discomfort and dyspepsia excess gas due to digestive process may inflate the stomach and produce the feeling of flatulence and discomfort.
6. Anorexia (Loss of appetite): It is due to usually psychogenic, food fads, anemia, indigestion, lack of physical activity, gastritis, TB, other infections and neoplasms.
7. Acute pain coming suddenly maybe due to acute pancreatitis, acute cholecystitis, acute gastritis, acute appendicitis, diverticulitis, peptic ulcer, duodenal ulcer or hiatus hernia.
8. Colic: It is a very severe pain of intense quality and quite unbearable due to biliary colic by impaction of gallstones and intestinal colic due to interception or intestinal obstruction.
9. Nausea and vomiting: Maybe due to peptic ulcer, appendicitis, acute gastritis, spicy food, alcohol, drugs, uremia, Addison's disease, brain tumor, viral hepatitis.
10. Constipation: Stool is hard, dry and small causes can be dietary defect. Less fluid consumption, lack of training, neglecting the call, mechanical obstruction, megacolon, anal fissure, piles, narcotics, antacids.
11. Diarrhea: Maybe due to indigestion, infection, wrong food, bacillary dysentery, and amebic dysentery, overuse of purgatives giardiasis.
12. Vomiting:
    A. *Abdominal:* Gastric acidity and chronic gastritis, peptic ulcer, cancer, pyloric stenosis, portal obstruction, syphilis, cirrhosis liver, chemicals poisons, corrosives and irritants, appendicitis, intestinal spasm, obstruction/intussusception, lead poisoning worms, billiary and renal colics, pancreatitis, cystitis, pelvic congestion and inflammation. Emetics such as hypertonic saline or copper sulphate, drugs, traumatic shock, Meniere's disease, sea sickness, air sickness.
    B. *Central:* Cholera, meningitis, intracranial tumors, hemorrhage, cerebral edema, trauma, migraine.
    Drugs such as morphine, emetone, degitahis.
    C. Topic: Hepatic failure, anemia, acidosis, alkalosis, toxemia of pregnancy, cyclic vomiting of childhood.
    D. Psychic: Hysterical.

Management

1. Keep patient at rest. No food by mouth except small pieces of ice.
2. If dehydrated start IV glucose saline drip.
3. Give anti-emetics and anti-nauseants preferably injection or in saline drips: Medicines used in practice are as belows:
    i. Draminate (RPG 50 mg tab/syrup/inj 5 mg/kg preferably inj or syrup.
    ii. Grauol tab 50 mg (Wallace) 1 tab tds.
    iii. Abdome suspension 5 mg/10 mg (Arbro) 1 tsf tds.
    iv. Arkadom tab 10 mg (Cosine Health Care) 1 tab tds.
    v. Casdom tab 5/10 mg (Health Care) 1 tds.
    vi. Domperon 10 mg tab/susp (Cadila).
    vii. Domestal 5 dt. Tab (Torrent) 1 tds.
    or domestal susp 1 tsf 6 hourly.
    viii. Avomine tab 2.5 mg (Nicholas) 1 tds.
    viii. Vomipreg tab (Waver Bio Tech) 1 tds.

ALIMENTARY SYSTEM

It starts from lips and ends at the anus. It is always good to examine in daylight when the patient faces light. Otherwise a torch centrally illuminated should be used.

Lips

1. Note the color. It could be blue due to cyanosis, may be due to Fallot's tetralogy, CCF, acute and chronic constructive pericardia, pressure on

neck veins by tumors or constriction, mitral stenosis, LVF, diseases of the lung, pneumonia, pulmonary infarction, pulmonary embolism, tracheal or bronchial obstruction due to foreign body or tumor. High attitude above 12,000 feet, and due to exposure of extreme cold.

2. The lips maybe pale in anemia, shock.
3. Note presence of crusts, fissures due to extreme-cold and also ulcers due to vesicular eruption caused by herpes virus called "herpes febriles" or "herpes lebialis" in case of upper respiratory passage infection or pneumonia.
4. Look for congenital anomalies:
   a. *Lip-Pit syndrome:* When there are two congenital pits located on either side of the midline of the lower lip in an infant with repaired cleft plate. The abnormalities of the extremities should be observed in association with this syndrome.(The practicising dentist might not get an opportunity to locate as infants are rare to visit the dental clinic).
   b. Look for William's syndrome where lips are prominent, mouth is wide and pre-orbital fullness.
   c. Look for Hurler's syndrome where lips are prominently big and also the tongue with spaced teeth.
   d. Look for trisomy syndrome (Paltau's syndrome) where there are bilateral cleft lips, palate and microcephaly and also "Goldenhars syndrome" with same lip abnormality but with ocular dermide pedunculated oracular appendix.
   e. Look for "Crouzon's disease" where lower lip is protruded along with autocephaly (tower head) exophthalmoses and strabismus.

Teeth

Temporary teeth = 20

1	First two lower incisors	6 to 8 months
2	Four upper central incisors	8 to 10 months
3	Lower lateral incisors plus front molar	12 to 14 months
4	Upper canines	18 to 20 months
5	All posterior molars	24 to 30 months (2 to 2½ years)

Permanent teeth = 32

1	First molars	6 years
2	Central incisors	7 years
3	Lateral incisors	8 years
4	Bicuspid	9 to 10 years
5	Second molar	12 to 13 years
6	Third molar (wisdom tooth)	25 years

Examine the teeth one by one thoroughly.

1. Look for damage, cracks, caries of the teeth and cavities.
2. Look for "Hutchinson's teeth" they are peg shaped having semilunar notch. They are usually discolored. The molars also tend to be moon dome shaped.
3. Tap the teeth or press by fingertip to find out if there is pain. If there is pain the tooth is diseased and requires X-ray exam and detailed study. If tenderness is found, then grip the tooth in two fingers to find out whether they are shaky or firm. This will help to pick-up the abnormalities quite earlier within the effective treatment range.
4. Look for congenital anomalies of the teeth:
   a. Individual tooth may be abnormal, retarded eruption, slow but this could even be with acquired causes such as hypopituitarism, hypothyroidism and rickets.
   b. Look for fusion (germination) of more teeth shortened or even sub-merged. Mal-alignment of lower and upper jaws.
   c. Look for mandibulofacial dysostosis, mal development of half of the face.
   d. Look for "Saintou's" disease where there is delayed closure of fontanels, cranial sutures, underdeveloped face and teeth as well as absence of clavicles or "Crouzon's disease" where clavicle is present.

e. Look for "Teacher's-Collings syndrome" (Mandibulofacial disosthosis) where there is hypoplasia of facial bones specially zygomas, abnormal external ears and lower eyelids and may have delayed dentition.
f. Look for absence of one or more teeth, super numeric teeth, supraeruption of teeth beyond occlusal plain.
g. Look for "Down syndrome" where teeth have dysphasic enamel with high prevalence of periodontal diseases and mal occlusions of teeth, small ears and slanting palpable fissures and flat nasal bridge.
h. Look for "Apert-Crouzon's Sac three chotzen and Pfeiffer Syndrome" where there is crowding of the teeth along with mental retardation, tall forehead and maxillary hypoplasia and asymmetrical facial distortion.
i. Look for "Gardner's syndrome" where there is dentigerous cyst, supernumeric teeth, delayed teeth eruption and osteoma of mandible.
j. Look for "Sjögren's syndrome" where there is extensive caries, parotid swelling and xerostomia.
k. Look for "Hurler's syndrome" where there are space teeth with mental retardation.
l. Look for "Prader-Willi syndrome" when there is enamel hypoplasia dental caries along with long arms.
m. Look for "Papillon-Leféevre syndrome" when there is early exfoliation of primary teeth and late eruption of secondary teeth, coming after the age of 16. The patient is edentulous in between.

Tongue

Functions

Speech, taste (Sweet-tip, bitter-papilla at the back, salt, sour).

Movements during eating to shift the bolus on either side to be chewed by teeth of either side.

Examine the tongue for:

1. Size.
2. Shape.
3. Mobility.
4. The color.
5. Coating.
6. Moisture.
7. Surface.
8. Ulceration.
9. Deficiency diseases.
10. Infections.
11. Allergy.
12. Abnormal movements, deviation.
13. Speech disturbances.
14. Congenital anomalies of the tongue.
15. Loss of taste.
16. Glossodynia (burning and painful tongue).
17. Tongue tie.

Size

A. Atrophied—Anemias
B. Large tongue: Cretinism, myxedema, acromegaly, amyloidosis, malignancy, cysticercosis

Shape: Half the tongue is wasted and deeply grooved (lingual hamiatrophy) due to unilateral hypoglossal nerve palsy.

Mobility: It is affected due to tongue tie, granulomatous infection, ulcerative and proliferative lesions, chancre (primary syphilis) Ludwig's angina (may not be infectious but is characterized by an indurated swelling of whole floor of the mouth); rarely cysticercosis.

The Color of the Tongue

Pale: It in anemia's, shock
Red: Spru, pellagra
White: Thrush, syphilitic patches (in secondary syphilis).
Magenta: Riboflavin vitamin deficiency.
Yellow: Severe Jaundice.
Cyanosed: In polycythemia vera, CCF, Fallot's tetralogy, respiratory obstructive disorders.

Strawberry and raspberry: In scarlet fever.
Xanthomas under mucous membrance of the *tongue:* In bronze diabetics.

Coating of the tongue: In febrile conditions; chronic gastritis, typhoid, uremia, unilateral furring is in trigeminal nuralgia.

Moisture: Dry tongue in dehydration, in mouth breathing, condition producing dyspnea.

Surface: Smooth in pernicious anemia, pellagra hemorrhagic in hemophilia, purpura, tellangiectasia.

Ulcerations

1. At margins in epilepsy.
2. Ulcer on frenum in whooping cough.
3. Tuberculous ulcers indicates pulmonary TB.
4. Aphthous ulcers in colitis or digestive disturbances.
5. Malignant ulcer in cancer of the tongue.

Deficiency Diseases

1. Pernicious anemia.
2. Spru.
3. Pellagra.
4. Beriberi.
5. Scurvery.
6. Atrophic glossitis early followed by generalized stomatitis.

Infections

1. Pemphigus vegetans.
2. Bacterial.
3. Pyorrhea.
4. Herpetic ulcers.
5. Virus ulcers.
6. Foot and mouth disease.

Allergy

1. Chancre sores.
2. Angioneurotic edema.

Abnormal Movements and Deviation of the Tongue and Loss of Taste

1. On protrusion if deviation is on one side it is hypoglossal nerve palsy of the same side.
2. Disturbance of taste due to facial nerve palsy distal to geniculate ganglion.
3. Mushroom tongue: In progressive bulbar palsy accompanied by wasting, wrinkled mucosa and fibrillary twitching.
4. In pseudobulbar palsy, the tongue is smaller and pointed due to spastic contraction of the muscles.
5. Tremors are present in parkinsonism, alcohol withdrawal, and high fevers.

Speech Disturbances

1. Dysarthria—Abnormality due to disturbances of functions of muscles of phonation:
   i. Slurred or thick "bulbar" speech in GPI and pseudobulbar palsy.
   ii. Scanning or syllabic speech—In acute cerebellar lesions, disseminated sclerosis, and hereditary ataxias.
   iii. Staccato speech—Words spoken in a curious jerky manner in disseminated sclerosis.
   iv. Slow and monotonous speech in parkinsonism.
   v. "Hot potato" speech–Slow thick and clumsy articulation, as if the patient had a foreign body in his mouth in Friedreich's ataxia
   vi. Feeble slurring speech in myopathies and myasthenia gravis, late stage of progressive bulbar paralysis, syringobulbia and medullary tumors.
2. Aphasia:
   i. Motor aphasia–Inability to express oneself in speech. The patient is forced to repeat few monotonous words in answer to every question. Found in affection of Broca's area. The patient recognizes his own mistakes as soon as he has uttered some wrong words.
   ii. Sensory aphasia – (a) Auditory aphasia—inability to understand spoken words in

lesion involving the superior third of the superior temporal convolution. In word deafness the patient is not aware of his own errors. In severe cases the patient may talk jargon (syntactic aphasia). (b) Visual aphasia—Inability to understand written words in lesions involving the angular gyrus.

iii. Amnestic (nominal) aphasia—Difficulty in naming of object, e.g. a pencil is called "a thing to write with" occurs in lesions of temporal lobe.

iv. Total aphasia—Complete aphasia due to lesion implicating several or all of the speech centers.

Causes of aphasia: 1. Cerebral thrombosis or atheroma. Rarely hemorrhage or embolism, 2. Hypertensives encephalopathy, 3. Intracranial tumor or abscess, 4. Encephalitis, 5. GPI.

3. Palilalia: The patient repeats, over and over again, a word or phrase, which he himself has just spoken in parkinsonism sometimes.
4. Mutism: Complete loss of speech in absence of organic disease of the nervous system in schizophrenia.
5. Aphonia: Patient talks in a whisper due to affection of vocal cords or disease of the larynx.

Congenital Anomalies of Tongue

A. Scrotal tongue: Tongue is thick and deeply fissured.
B. Geographic tongue: Red, denuded dried, irregular patches on the tongue.
C. Median rhomboid glossitis: Occupied middle third of tongue, smooth dusky red as asymmetrical lesion.
D. Swelling of tongue localized or generalized may be due to macroglosia and cyst. In acquired localized conditions: such as malignancy, TB, gumma in generalized acquired cretinism, myxedema, arcromegaly.

Loss of Taste

From childhood to old age 65 percent of taste buds on the circumvallates papillae are lost. The taste for sweet, sour and bitter lost earlier. Decreased taste may be caused due to loss of smell sensation.

Acute loss of sense of smell and taste is found in acute coryza: Chronic loss is found in viral infection of influenza, surgery, and radiation therapy or drugs such as high dose of aspirin or pressure nasal polyps and cancer or liver diseases, hyperthyroidism, ileitis and head injuries.

Glossodynia (Burning and Painful Tongue)

In postmenopausal syndrome, diabetes, nutritional deficiencies, or referred pain from a dental disorder.

DISORDERS OF SALIVARY GLANDS

Excessive Salivation

a. Irritation or inflammation of mouth (oral sepsis).
b. Trageminal neuralgia.
c. Esophageal obstruction.
d. Postencephalitis Parkinson's.
e. Drugs such as potassium iodide.

Deficient Salivation (Xerostomia)

a. Acute fevers.
b. Dehydration.
c. Sjögren's syndrome (dryness of mouth, eyes, keratoconjunctivitis and rheumatoid arthritis).
d. Drugs such as atropin, belladonna (anticholinergic).

Parotitis

a. Virus infection causing mumps.
b. Bacterial infection causing abscess.
c. Tumors.

Salivary Calculi

Can be felt on palpation at the floor of the mouth (requires excision).

Tumors

Usually unilateral, show various degree of malignancy (requires excision).

DISEASES OF ESOPHAGUS

Dysphasia

Causes of Dysphasia

1. Local causes in mouth and pharynx, stomatitis, tonsillitis, TB, laryngitis, retropharyngeal abscess.
2. Neurological disturbances:
   a. Nervousness, emotional stress (globus pallidus).
   b. Bulbar and pseudobulbar palsy.
   c. Diphtheria neuritis.
   d. Myasthenia gravis.
   e. Achalasia cardia.
   f. Globus hystericus (a subjective feeling of chocking of imaginary lump in the throat).
   g. Drugs such as livodopa therapy for Parkinson's.
3. Compression of esophagus from outside:
   a. Goiter.
   b. Aortic aneurysm.
   c. Enlarged mediastinal lymph nodes or lymphoma or cancer breast or bronchus.
4. Intrinsic esophageal disease:
   a. Atresia of upper end of esophagus in newborn.
   b. Congenital short esophagus with hiatus hernia in newborn.
   c. Esophagus and ulceration.
   d. Sliding hiatus hernia.
   e. Strictures.
   f. Plummer-Vinson syndrome.
   g. Systemic sclerosis.
   h. Tumors and cancers.
   i. Pharyngeal pouch/diverticulum's between esophagus and curvical spine.

Achalasia (Cardiospasm) of the Cardia of Esophagus

It is the failure to relax the sphincter at the lower end of esophagus resulting in progressive atony and dilation of esophagus, slow progressive dysphasia, putrefaction of retained foodstuff leading to halitosis and occasionally inhalation causing recurrent pulmonary infection and progressive loss of weight.

X-ray after barium swallow is diagnostic, esophagoscopy helps to remove the retained material.

Treatment is dilatation or cardiomyotomy, complication is serious due to esophageal perforation.

Carcinoma of Esophagus

Usually squamous cell, extends longitudinally and appears ulcerative, causes progressive dysphagia. Lower third is common site, X-ray after barium swallow and esophagoscopy and biopsy is confirmative.

No radical excision is possible. Radiotherapy is helpful intubation's making liquid diet possible. Death is inevitable.

DISEASES OF STOMACH AND DUODENUM

Peptic Ulcer

One of the common disorder of alimentary tract that affects the youth in their working years of life.
Site: Lower end of esophagus, the stomach, and duodenum
Cause: Peptic ulceration due to digestion of mucosa by the acid pepsin of gastric juice on lowered mucosal resistances.

Associated factors:

1. Hyperacidity.
2. Irritant food lowering local mucosal resistance.
3. Drugs like aspirin.
4. Infections causing gastritis.

5. Physical, mental and emotional stress.
6. Hereditary.
7. Sex more common in men.
8. Environmental common in lower socioeconomic classes.
9. Seasonal factors incident is more in October and spring.
10. Habits, tobacco and alcohol consumption enhances the incidence.

Clinical features: Mild or moderate epigastric pain of long duration relieved by food or vomiting; or antacids and increased by dietary indiscretions. Alcohol and tobacco. Other symptoms are flatulence, discomfort, nausea, vomiting and anorexia. "Pointing sign" and localized tenderness are most reliable signs.

X-ray after barium meals and gastric analysis and gastroscopy are diagnostic.

Treatment

1. Complete bed rest till ulcer is completely healed in hospital or home.
2. Sedation.
3. Dietary regime, soft nourishing semi-solid and liquid diet in less quantity but more frequencies, cold milk preferred.
4. Avoid tobacco and alcohol and irritant food.
5. Antacids, vitamins.
6. Avoid citrated fruits or fruit juices, spicy food, strong tea and coffee.

Complications (All serious)

1. Bleeding ulcers hematemesis, melena, anemia examine of blood picture, stools examine, blood transfusion.
2. Perforation: requires surgery and treat peritonitis.
3. Malignancy in chronic peptic ulcer requires bioscopy, surgery and radiotherapy.
4. For recurrent ulcer, repeat investigations and repeat treatment and remove all the adverse factors.

Acute and Chronic Gastritis

Acute inflammation of the gastric mucosa due to ingestion of irritant material, alcohol, drugs such as aspirin and phenilbutazol or even infections such as diphtheria, influenza and swallowed septic material from nasopharynx and oral sepsis.

The condition may pass as symptomatic or symptomless because the gastric mucosae are insensitive tissues. However, vague symptoms of loss of appetite, nausea, heartburn may occur but they are short-lived.

Treatment: Keep the patient on cold milk diet. A cup every half an hour complete rest in bed, omit alcohol, tobacco, strong tea or coffee, citrated fruit juices give sedatives, treat infections with inject able antibiotics. The nasopharyngeal and oral sepsis are treated by local conservative treatment. Chronic gastritis is usually associated with peptic ulcer and malignancy requires proper investigation and treatment.

Carcinoma of the Stomach

It is one of the commonest tumor of GI tract. About 70 percent at the lower end of the pylorus; occasionally infiltrates in the whole body of the stomach so called "Leather bottle stomach." X-ray after barium, gastroscopy and biopsy is diagnostic. Gastric analysis is contributive. There is anemia, hematemesis, melena. ESR is high. In border line cases, leprotomy is advisable. Surgical treatment is necessary. Aspiration of ascitic fluid shows malignant cells and has got diagnostic value.

DISEASES OF THE SMALL INTESTINE

The main function of the small intestine is to absorb the digested food with the help of enzymes and products produced by pancreas, liver and also the cells of intestinal wall.

Thus, if there is malabsorption syndrome of carbohydrate, protein, vitamin B_{12} and folate, iron

and other minerals these are not added in the body. The malabsorption of the fats is called steatorrhea.

The principal disorders causing malabsorption:

1. Celiac disease.
2. Tropical sprue.
3. Crohn's disease.
4. Intestinal obstruction.
5. Acute appendicitis and
6. Tumors of the small intestine.

Celiac Disease

In celiac disease, an abnormal mucosa of the small intestine which is susceptible to toxic agents is present due to digestion of protein, specially in wheat and rye flour.

Clinical features are usually seen in the first three years of the life. The stools are voluminous, pale and occasionally frequent. The child's growth is retarded and abdomen is distended. Reaching to the alert life the diarrhea becomes significant. They are supposed to be prone to get lymphomas and other form of malignancy. There is loss of weight.

Treatment: The patient should be given gluten free diet, which he has to be strictly followed. Replacement of vitamins, minerals, etc. to be carried out.

Tropical Sprue

It is defined as a primary mal absorption syndrome presented with chronic diarrhea, wasting and common in the people in the topical zone. The etiology is unknown and there may be many factors including environmental bacterial flora, endocrine and peptide hormones resulting into the clinical picture.

The main presenting symptom is chronic diarrhea of several months with loss of weight, wasting anemia, etc. There are scrunty skin changes and hair changes. The stools are always bulky, unformed, frothy and float in the toilet. The inter current infections are very common due to lowered resistance. Diagnosis is usually clinical and treatment is symptomatic.

Crohn's Disease

It is a slowly progressive, idiopathic, inflammatory disease affecting in the GI tract with high tendency to recur. This disease is uncommon in India. Chemical features are similar to that of topical spru and investigations are mostly clinical and other investigative methods for recurrent infections.

Treatment is mostly symptomatic giving nourishment orally intravenous and perrectum. Antimobility drugs and analgesics along with antibiotics when infection is there.

The surgery is reserved for complications such as gastrointestinal bleeding, perforation, etc.

Intestinal Obstruction

Maybe due to infussusception and the picture is quite serious requiring emergency surgery.

Acute Appendicitis

It is a serious disease which starts with fever, vomiting and pain in the right iliac fossa. A surgical emergency requires removal of the appendix. If there is perforation the peritonitis is very serious complication, requires gastric aspiration, maintenance of electrolytic balance and broad spectrum antibiotics.

Tumors of the Small Intestine

The benign tumors are less common than malignant ones which include leiomyomas, lipomas, hemangiomas.

The carcinomas arise from glands of the small intestine. The clinical features are frequently a symptomatic. After the growth is sizable, the signs and symptoms of intestinal obstruction appear and call for emergency surgery due to colicky pain. Investigations can be carried out preferably CT scan, ultrasonography, etc. before submitting the patient for surgery.

DISEASES OF THE LARGE INTESTINE

The main function of the large intestine is removal of waste product of digestion and store them before evacuation at controlled intervals. The digital examination of the rectum, endoscopy and stool examination as well as radiological examination and barium enema are confirmatory to diagnose the pathology.

Following diseases, come across:

1. Ulcerative colitis.
2. Diverticulitis.
3. Megacolon.
4. Irritable bowel syndrome.
5. Constipation.
6. Hemorrhoids (piles).
7. Prolapse .
8. Annal fissure.
9. Diarrhea.

Ulcerative Colitis

Apart from bacillary and amebic dysenteries certain chronic non-specific inflammatory disease occurs in the large bowel called ulcerative colitis. Clinically, disease is common between the age of 20 to 40. The main symptom is diarrhea loose bloody stools containing mucus and often accompanied with pain tenesmus. There is tenderness on palpation at the left iliac fossa. There is an element of paradoxicity, i.e. constipation followed by diarrhea. Associated factors such as emotional stress and intercurrent infections are existent. When medical treatment fails there is no alternative to surgery where colectomy with illeostomy and excision of rectum distal colon is requires to be removed surgically.

Sigmoidoscopy is diagnostic. The danger of malignancy cannot be underestimated.

Treatment: Hospitalization is necessary. Special diet will be charted out by the dietician. Symptomatic treatment can be given for anxiety, diarrhea and dehydration as well as deficiencies and Avitaminosis. A course of antibiotics is also helpful to counteract the existing local infection. Constipation should be treated with bowel wash. The sulphasalazine is used in the treatment and also corticoids are helpful. If anemia is severe blood transfusion is indicated. Alcohol tobacco, strong tea, coffee should be avoided and also spicy food. The risk of malignancy should be kept in the back of mind and required to be excluded in chronic cases.

Diverticulitis

The diverticula can occur throughout the GI tract but they are most common in large intestine. The symptomatology and treatment is just similar as is indicated in ulcerative colitis except that the diverticulae are seen in particular after barium anemia.

Megacolon

It is a condition where colon is dilated along with obstinate constipation. In Hirschsprung's disease the condition is congenital and the mesenteric nerve plexus are absent.
The treatment is surgical.

Irritable Bowel Syndrome

The symptoms, management and treatment is similar as given in the cases of ulcerative colitis and divertive colitis. Management is most important and special diet and nursing is very important.

Constipation

It implies the infrequent and incomplete evacuation of hard, dried feces.

Causes of Constipation

1. Low-residue diet.
2. Starvation.
3. Less intake of fluids, or loss of fluid due to vomiting or burns.
4. Certain drugs such as opiates, antacids.

5. Neglecting the nature's call.
6. Rare causes such as diabetics mellitus, myxedema, hyperparathyroidism, plumbism and porphyria.

Drugs used commonly are as under:

1. Cremaffin (liquid) emulsion one table spoon at bedtime (Abbott).
2. Dulcolax tab 1 to 2 at bedtime (German Remedies).
3. Exit enema (Readymade) once daily (standard).
4. Tab Pursenmid-1N 2 to 3 tab at bedtime at night (Novartis).

Symptoms: Neurosis, anorexia, feeling of unwell, loss of concentration and interest in the activities.

Treatment: Laxatives, purgatives, enemata and removal of the factors present in history of that patient.

Hemorrhoids (Piles)

Hemorrhoids are dilated vessel of the hemorrhoid vascular plexus. They are two types: 1. Internal piles 2. External piles.

But any patient can have both together.

There can be no symptom or there can be free bleeding drop by drop after the stool is passed. Treat the constipation with laxative, correct diet and adequate fluids. Surgery will answer to the patients who are not relieved by medical treatment and drug treatment for bleeding piles is as under:

Venusmin tab 150 to 300 mg/kg tid (Walter Bush mell).

Prolapse and Anal Fissure (Fistula)

Are quite infrequent disorders requiring immediate attention, correction of constipation, local treatment as well as correct diet. The fissure is quite painful and requires analgesic and antibiotic creams to be applied locally before passing the stools. Sometimes dilation improves the pain and local spasm and therefore, it becomes a part of the treatment, till the fissure is healed. Infection reaches peri-anal deeper tissues though tract requires to be excised surgically and healing promoted from the depth with antiseptic dressings. Otherwise if the healing does not come from below upwards, the mouth can get closed and fistula remains alive.

Anal Fissure

Painful condition more marked during defecation. It also bleeds when stool is hard. Patient is apprehensive to attend the nature's call. Diagnosis by inspection. PR with due caution the spasm is felt. Treatment usually prescribed is as under:

1. Ointment nuprecanal (Novartis) apply locally 2 to 3 times a day and just before passing the stool.
2. Ointment proctosedyl to be applied 2 to 3 times a day still the symptoms are relieved.
3. Mesecol enema (Sun Pharma) Readymade enema once daily already to be given to facilitate the constipation.

Diarrhea

Frequency of motions due to various causes including food poisoning, nervous diarrhea, ulcerative colitis, dysenteries, giardiasis, indigestion, etc. The symptomatic treatment is as under:

1. Tab lomophen 2 tab 3 times a day till diarrhea is controlled (RPG Life).
2. Tab lomotil 2 tab 3 times a day till diarrhea is controlled (RPG Life).
3. The lophamide 2 tab 3 times a day till diarrhea is controlled (Torrent).
4. Sazoem–(Wallan) 4 tab 3 times a day till diarrhea is controlled. It is also for ulcerative collitis.

TUMORS OF THE LARGE INTESTINE

Benign

They can be single or multiple. Mostly found in the left side of the colon. They are movable but can go up and down in the lumen of the bowel. They are found coincidentally during investigation. They may cause bleeding and discharge of mucus, or

intussusceptions occasionally occurs. Sometimes polyp may proplapse through the anus and appear as cherry red mass.

Carcinoma of Colon and Rectum

Common in UK. They occur in the left side of the colon or rectum. Multiple tumors are present. They are proliferative and fungating ulcerative and infiltrative. Maybe polypoidal encircling as stricture. They spread directly through the bowel wall lymphatics and also by bloodstream. Metastases are found in the lever. They cause obstructive lesions, bleeding, anemia, cachexia. There is severe weight loss. And symptoms and signs of obstruction are present. Management is symptomatical and surgical. Diagnosis is made by proctoscopy, sigmodascopy and barium enema. Surgically total exigency is the only answer which requires specialized nursing care, hospitalization and training of the patient for getting on with artificial rectum at lower abdomen.

PSYCHOGENIC DISORDERS

A. *Globus hystericus* (Feeling of a lump in the throat causing difficulty in swallowing occurring in between the meal). The individual is tense, anxious and psychologically broken.
B. *Psychogenic dyspeesia* is also a psychological manifestation when patient looses interest in eating and does not swallow the food even with forced feeding.
C. *Psychogenic vomiting* usually occurs after the breakfast. There is always regularity in the incidence but there is no weight loss.
D. *The irritable bowel syndrome* is called nervous diarrhea. It may be alternated with constipation. It is common in women between the ages of 20 to 40. They may complain of pain, generally relieved by defecation. Patient is always tense, anxious and apprehensive. History is always helpful to sort out these cases.

DISEASES OF LIVER, BILLIARY TRACT, JAUNDICE, ASCITES AND DISEASES OF PANCREAS

Liver: Hepatic Structure

Liver is a chemical factory of human body, has got two lobes larger right and smaller left, supplied by hepatic artery and portal veins and lymphatic and drained by hepatic veins to inferior vena cava.

Portal veins bring the absorbed food material, vitamins, drugs to the sinusoids along with endothelial cells called Kupffer's cells.

Hepatic Function

1. Metabolism carbohydrate, proteins, fats, vitamins, hormons and drugs.
2. Phagocytes through Kupffer's cells.
3. Produce bile and enzymes such as alkaline phosphatase.
4. Produce coagulation factors II, VII, X and vitamin K.

Hepatic Diseases

A. Acute hepatitis.
B. Chronic hepatitis.
   i. Persistent hepatomegaly.
   ii. Cirrhosis.

Acute Viral Hepatitis

Caused by:

i. Virus "A" and "B".
ii. Yellow fever virus (Virus "A" is infectious, occurs in epidemics, it is a serious disorder and incubation period is short while virus "B" is usually post blood transfusion and the incubation period is very long about 2 to 3 months).
iii. Non-viral-leptospira icterohemorragica (Weil's disease), Q-fever, toxoplasmosis.
iv. Toxic substances and drugs such as erythrosine, isoniazid, rifampicin, alcohol.

v. Amebic hepatitis.
vi. Infectious mononucleosis.

Signs and symptoms: Generalized gastrointestinal symptoms such as fever, nausea, vomiting, headache, malaise, jaundice, tenderness on liver, loss of appetite and stools are pale.

Liver function rest: Urine for bile salt, bile pigment, blood for enzymes test.

Management: Complete rest in bed for 3 to 6 months, nourishing but low fat, less protein and no fat diet, liquids and soft semi-solid are preferred. IV glucose saline with vitamins is indicated. Sedatives and hypnotics to be given guardedly.

Complications

1. Fulminant hepatic dailure.
2. Hepatic encephalopathy.

Both the complications are usually fatal. The management is difficult. Usually exchange, blood transfusions, plasmapheresis, hemodialysis is tried desperately and may be useful in borderline cases.

Chronic Hepatitis and Cirrhosis of Liver

Causes: Alcohol abuse, followed after acute hepatitis, infections, rarely metabolic hemochromatosis, and drugs such as methyldopa. Cholestasis due to blockage in the biliary channels by gallstones, cancer, stricture, prolonged hepatic congestion due to CCF.

There is widespread death of hepatic cells replaced by fibrous tissue and then regeneration of liver cells causing nodular hyperplasia, distorting the liver architecture and causing portal and systemic venous shunts.

Onset insidious, fatigue, anorexia, jaundice usually mild, fever, arthalgia, epistasis, spider telangiectasia, hepatomegaly and thyroid disorders. In cirrhosis the spelenomegally is eminent. Liver functions are abnormal.

Treatment: Corticosteroid are lifesaving given 40 mg per day, gradually reducing and carrying on the treatment for 4 to 6 months on maintenance dose along with vitamins and high carbohydrate, moderate proteins and low fat diet with complete rest in bed.

Prevention

Against hepatitis "B" virus:
1. Engerix B (gsk).
2. Genevac-B (Serum Instt.).
3. HB Vac (Cadila).
4. Hepatovex B (MSD).
   Dose: Prophylaxis: single 1 cc doses inj IM.
   Repeat after one month and six months.
   Booster dose after 5 years.

Against "A" Virus
1. Gamafine (Haffkines).
2. Havarix (GSK).

Dose: 1 cc inj IM booster dose after 6 to 12 months.

Classification of Cirrhosis (Liver)

A. *Portal cirrhosis:* The commonest is usually nutritional deficiencies.
B. *Biliary cirrhosis:* Due to biliary obstruction.
C. *Cardiac cirrhosis:* Due to congestive heart failure CCF.
D. Rare types such as hypatolenticular degeneration, bilharzial, hemosiderosis, multiple amebic abscesses, chemicals such as arsenic poisoning, infections such as malaria, schistosomiasis, TB, alcoholic.
E. Portal venous obstruction.
F. Malignant primary or metastatic.

The clinical features are same as chronic hepatitis along with symptoms of causative factors, which are diagnosed after proper investigations.

There is massive death of hepatic cells and replacement of fibrous tissue causing contraction and thereafter proliferation and regeneration of remaining of hepatic cells causing nodular

appearance. It is usually accompanied by ascites and various grades of jaundice. All liver function tests, scanning, liver biopsy and blood urine and stool examination contribute to reach the specific diagnosis and help to render the proper treatment and management of the patient who requires hospitalization, proper nursing care and strict dietary regime.

Borderline cases yield optimistic results if co-operation of the affording patient is successfully motivated.

Hepatomegaly

It is a problematic clinical finding and present as a palpable tender liver at one end and a very large hard liver 5 to 6 fingers and maybe soft, tender or hard or nodular with or without ascites.

It should never be considered as an isolated sign but through clinical examination to be made keeping all possible causes behind the back of mind.

The Causes of Hepatomegaly

a. Infective maybe bacterial such as pyemic abscess, viral such as hepatitis, spirochetal such as Weil's disease.
b. Bililary—Such as gallstones, tumors pressing the biliary channels.
c. Circulary—Such as CCF, pericarditis.
d. Parasitic—Such as amebiasis, hydatid cyst, malaria.
e. Neoplastic—Primary or metastatic.
f. Blood diseases such as thrombocytopenia, lukemias, hemolytic anemias.
g. Lymphogranulomas such as Hodgkin's disease
h. Poisoning such as arsenic phosphoros.
i. Metabolic such as diabetese. Nutritional, hemosiderosis.

After clinical assessment and relevant investigations, one has to reach correct diagnosis which will guide for correct therapeutic approach. In early and borderline cases considerable relief can be obtained but in advanced and complicated cases, the consequences are usually fatal.

Jaundice

Condition when bile pigment causes yellow discoloration in the skin, conjunctiva, body fluids and urine.

Causes

1. Infective as in acute hepatitis, Weil's disease, drugs such as arsenic gold.
2. Obstructive maybe due to gallstone, cancer, hydatid cysts, abscess, enlarged glands pressing.
3. Hemolytic such as sickle cell anemia, malaria, drug sensitivity, incompatible blood transfusion.

Investigations

1. Urine.
2. Stools.
3. Serum bilirubin.
4. van den Bergh's test.
5. Liver function tests.
6. X-ray for gallstone and esophageal varices.
7. Liver biopsy.
8. Casoni test for hydatid cyst.
9. Blood test for anemia, malaria, Kala azar.

Treatment

1. General treatment.
2. Symptomatic treatment.
3. Radical treatment.
4. Preventive treatment.

To be carried out as already discussed earlier.

Ascites

Accumulation of abnormal fluid in the peritoneal cavity is called ascites.

Causes

1. Infection of peritoneum.
2. TB.
3. Malignancy.
4. CCF.

5. Blood disorders such as leukemia.
6. Hypoproteinemia.
7. Renal disorders such as
8. Nephrotic syndrome.
9. Ovarian cyst or tumors.
10. Chylous ascites due to damage to the thoracic duct or filariasis.
11. Wet beriberi.
12. Polyserositis.
13. Epidemic dropsy.
14. Cirrhosis liver.

Diagnosis

1. Inspection no. 2, palpitation for fluid thrill and shifting dullness. PR for piles and local lesions.

Treatment

Treat the cause and carry on general, symptomatic and preventive treatment.

Liver function test

1. Urine for bile salts and bile pigments.
2. Stools for urobilinogens.
3. Screen bilirubin.
4. van den Bergh.
5. Serum proteins.
6. Cephalic cholesterol flocculation test.
7. Alkaline phosphatase test.
8. Serum cholesterol.
9. Response to vit K (and see if prothrombin time increased).
10. Hipuric acid test.
11. Galactose test.
12. Colloidal gold test.

All these tests are helpful to assess the degree of hepatic insufficiency and parameters for recovery after treatment.

Hematemesis

Blood vomiting is called hematemesis. It is a medical emergency and both patient and relations are terribly apprehensive and alarmed. Clinical assessment is most important including family history and history of the present complaint, duration and quantity of the blood so far vomited. Simultaneously, urgent blood examinations for blood grouping, CT, BT and platelet counts as well as for hemophilia and other factors to be examined and results to be obtained even telephonically and blood bank to be intimated for cross matching and keeping suitable fresh blood available might be required to be given to the patient immediately.

Keep the causes of hematemesis as mentioned below behind the back of mind while carrying out the clinical examination.

Causes of hematemesis

a. *Intrinsic causes:* Such as swallowed blood after orophrangeal surgery, esophageal verisis, peptic ulcer, malignancy, gastritis with erosions, hiatus hernia, foreign body.
b. *Extrinsic causes:* Portal hypertension, cirrhosis of liver, amyloidosis, blood dyscrasias such as purpura, polycythemia, lukemias, hereditary telangiectasia, jaundice, drugs such as aspirin.

Management is most urgent and should be prompt and full guidance to be taken from the results of investigations. If Hb is below 7 gm percent blood transfusion to be immediately started without any waste of time. Patient requires to be hospitalized with best possible nursing care and assistance of gastroenterlogist surgeon and hematologist must be sought for without reservation.

The relations of the patient should be informed about the seriousness of the event and the best possible efforts being done and possibility of worst prognosis with a word of assurance. If diagnosis is reached and proper assistance is available the outcome may be encouraging and hematemesis maybe controlled.

DISEASES OF BILIARY TRACT

Interlobar bile ducts join together and form right and left hepatic ducts come out of liver and join to form common hepatic duct to which the cystic duct

from gallbladder joins and then terminate into duodenum along with pancreatic duct. The capacity of gallbladder is 50 ml. It function is to concentrate the bile ten-fold which is produced by liver about 1 to 2 liters per day and keep the concentrated bile as reservoir and empties reflex when food reaches the duodenum.

Condition of gallbladder can be assessed by the investigations such as plain X-ray for gallstones, cholecystography, IV and percutaneous endoscopic retrograde cholangiography.

Gallstones are made by calcium slat, bilirubin or mixed with cholesterol and can produce obstructive biliary jaundice.

Acute Cholecystitis

Etiology as mentioned above the commonest cause is obstruction due to gallstones, rarely it could be neoplastic or irritation due to typhoid bacteria or reflex pancreatic secretions into gallbladder.

Signs and symptoms: Pain of various grades, maximum as colic, tenderness below right hypochondrium, nausea, vomiting, fever with chill and jaundice.

Management: Complete rest in bed, antibiotics, analgesics and sometimes surgery when medical treatment fails.

Chronic Cholecystitis

Multiple attacks of acute episodes lead to chronic condition, specially when gallstones are execrated into duodenum and patient gets relief in between. All other signs and symptoms remain more or less the same, but dyspepsia, loss of weight and associated signs of pancreatitis.

Usually, cholecystectomy is performed to get satisfactory results.

DISEASES OF PANCREAS

Pancreas

A large elongated racemose gland lies behind the stomach in between duodenum and spleen producing exocrine and endocrine secretions helping to digest carbohydrate fat and proteins controlled by nervous system.

The endocrine secretion is glucagons produced by alpha cells insulin produced by beta cells of islets of Langerhan's scattered throughout the gland governed by hormonal mechanism of growth hormones and adrenocortial hormones.

Investigation of Pancreas

It is difficult to investigate; plain X-ray abdomen may show calcification in the pancreas.

Radioscopy may reveal defects in its take. Ultrasonography is easy and more helpful.

Indirect tests: such as examination of stools show abundant fat globules (Steartorrhea).

Acute Pancreatitis

It is a serious disorder due to auto-digestion of pancreatic tissues by its own enzymes causing hemorrhagic neurosis localized peritonitis mostly occurs between the age of 40 to 70 years with an equal sex incidence, mostly seeming due to obstructive pathology to pancreatic duct.

Signs and symptoms: Sudden agonizing pain in the epigastric after food or alcohol radiating to back and occasionally to shoulder. Nausea, vomiting and condition of profound shock supervenes mild fever and jaundice may develop.

Management: Hospitalization, complete bed rest, inj pethedine 100 mg, treat shock with IV glucose saline drip, IV calcium, treat BSL.

Nasogastric suction, antibiotics for preventing secondary bacterial infection. Corticosteriods have no specific place. Aprotinin which inhibit proteolytic enzyme may give good result.

Emergency surgery maybe required for residual abscess, pseudocyst cause of biliary obstruction.

Prognosis is grave and depends up on complication of hemorrhages and peritonitis.

Chronic Pancreatitis

Due to recurrent attacks of acute episodes excessive fiber tissue develops in the pancreas causing atrophy of acinar cells and followed by obstruction to main pancreatic duct may even be due to stricture, papilloma or stone or may occur due to penetration of chronic duodenal ulcer into the body of pancreas. This may also occurs due to hemochromatosis.

Clinical Features

Mostly depends upon quantitative damage common in men during 5th or 6th decades usually in alcoholics.

Pain in epigastric radiating to back relieved by knee elbow position mainly precipitating after meals or alcohol. Diabetes is common malabsorption and weight loss is marked. Fatty diarrhea is common.

Investigations

Serum amylase may not be very helpful as in acute pancreatitis Isotope up takes is patchy.

Ultrasonography maybe helpful to greater extents.

Management

Omit alcohol totally, low fat diet, control diabetes with insulin. Surgery is only called for excision of stricture—stenosis stones or malignancy and cysts. Acinar carcinoma and adenoma of islets of Langerhan's are rare causes .

Zollinger-Ellison syndrome where acid tide of stomach is high that it enters upper small intestine inactivate lipase and bile salts bile salts maybe precipited causing diarrhea and steatorrhea on one hand and large peptic ulcers on the other complicated with bleeding episodes and even perforation. The symptom maybe clinically suspected by recurrence of peptic ulcer even after surgery, rarely total gastrectomy is the only treatment of choice.

Future Prospects of Gastroenterology

Endoscopy and laparoscopy have revolutionized the diagnostic scenario.

Chemotherapy has added our effective armamentarium to control and early cure the infective processes, thus minimizing the period of suffering and also minimizing the mortality and morbidity.

Dieticians have contributed a lion's share in improving the desirable outlook in helping the gastroenterologists and public in general substantially and dependably.

Availability of good quality food in affordable cost limit of a common man has become worst due to the problem of global worst over population disproportionate to the global production of food material.

Pollution has lowered the standard of lifestyle, stamina, resistance and causing serious and grave implications and require drastic global radical measures.

Gastroenterology both medical and surgical have become popular and getting public acceptance day by day, thus adding to the outstanding volume of experience and revolution in technology assuring a bright promising future.

Nephrology 9

KIDNEY

It is the execretory system of human body although some other important regulatory functions are also accomplished. The unit is nephron, which contains glomerulus in cortex of the kidney and tubules in medulla of the kidney.

There are two kidneys each having one million nephron which are supplied 1300 ml of blood per minute through renal arteries which is 20 percent of cardiac output responsible for excretion of metabolic waste products and also reabsorbing H_2O, Na, K, etc. There is autoregulation of renal blood flow.

1. The glomerulus is an important part of the nephron which is intimately concerned in:
   i. Regulation of volume of fluids in the body.
   ii. Regulation of blood pressure.
   iii. Does filtration of fluids from plasma except proteins and fats.
   iv. Secrete renin which regulates hypertension.
2. *Tubules:* Which are proximal and distal parts and render very important additional functions. The tubular length of both kidneys in about 100 km.

The functions of the tubules:

i. Regulation of water contents of the body.
ii. Regulation of electrolytic balance.
iii. Maintenance of acid base equilibrium.
iv. Reabsorption of vital substances which body requires.
v. Excretion of metabolic products.

In the proximal part of the tubule 2/3rd of the excreted fluid Na, K, and H_2O is reabsorbed.

Remaining part, tubule bicarbonate and NaCl is absorbed.

Urine Functions

Urine reflects the kidney function in following ways:

1. Volume normal 12 to 1500 cc a day. If more, is called polyurea which maybe due to:
   a. Alcohol, tea, coffee.
   b. Drugs, diuretics, digitalis.
   c. Cardiovascular diseases, angina, paroxysmal tachycardia.
   d. CNS diseases such as neurasthenia, migrain, tachycardia, epilepsy.
   e. Endocrine diabetes mellitus, diabetes insipidus.

f. Renal polycystic kidney, chronic nephritis.
g. Environmental in very cold climate.

2. Oligurea causes:
   a. Severe infection.
   b. Hypotension, CCF.
   c. Acute nephritis and uremia.
   d. Very hot season.
3. Transparency normally it is clean. Turbidity maybe due to pus or phosphates, milky in chyluria.
4. Color
   Yellow: In Jaundice and B complex vitamin consumption.
   Red-brown: In hemoglobinuria, black water fever, in incompatible blood transfusion
   Port wine: In porphynuria, in hemolytic jaundice, smoky in hematuria.
   Black: In alkaptonuria, melanoma.
   Dark brown: In hepatitis, malaria, acute infections and drugs.
5. *Odor:* If aromatic odor, due to diet or drugs.
6. *Reaction is acid:* Strong is acidosis, diabetes, gout, lithiasis, encephalitis, leukemia and scurvy
7. *Specific gravity:* 1017 to 1020 is normal, high in fever, diabetes uremia
8. *Microscopic:* Crystals of uric acid, cal oxalates, leucin, cystine, tyrosine, RBC and pus cells.
9. Casts hyaline, granular, waxy, fatty, cellular, epithelial.
10. Bacteriological culture and sensibility test common in *E. coli*, pyococci, TB.
11. *Special tests:* (a) pregnancy test (b) 17-ketosteroid and oxycorticosteroid for malignancy.

Renal Function Tests

1. Urine examination.
2. Blood for CBC, ESR, blood urea, serum uric acid.
3. Urea clearance test.
4. Ultra sound.
5. X-ray abdomen.
6. IV pyelogram.
7. Retrograde pyelogram.
8. Renal arteriography.
9. Radioisotope renal scan.
10. Renal biopsy and renal CT scan.

RENAL DISEASES

1. Acute nephritis
2. Subacute and chronic nephritis.
3. Nephrosis.
4. Renal failure, uremia, anuria.
5. Pyelonephritis.
6. Polycystic kidneys.
7. Congenital renal anomalies.
8. Hematuria.
9. Renal stones.
10. Tumors.
11. Affections of kidney in systemic diseases.

Acute Nephritis

Abrupt diffuse inflammatory reaction of the glomeruli of both the kidneys which is usually by hemolytic streptococci in tonsillitis or any other infection also such as pneumococci, leprosy, malaria, schistosomiasis or even in infective endocarditis.

Clinical Features

Most common in male children. History of exposure to cold evidence of tonsillitis, scabies, empetigo, furunculosis, acute fevers, malaria, mumps, pneumonia or otitismedia. There is puffiness of face, scanty urine, smoky color of the urine, albuminuria, containing blood casts. There is hypertension, tachycardia and apical systolic murmur. Headache, drowsiness, restlessness, vomiting, diplopia, convulsions in children and fever is always there.

Course and Progress

Ninety percent children recover completely but for an adult and middle aged about 50 percent. The

acute manifestations are lessened in 3 to 4 days and recovery takes place in about a fortnight.

Remaining patients either go to uremia stage or develop complications such as renal failure, uremia, pulmonary edema and oliguria, edema of glottis marked hypertension. Convulsions, peritonitis, pericarditis and the patient may die due to hypertensive encephalopathy.

Treatment

General, complete rest in bed, warmth, high carbohydrates and low protein diet, restrict the fluids, half liter per day. Less salt diet. Antibiotics for infections along with anti-allergics. Avoid corticosteroids. For other complaints, give symptomatic treatment. If anuria develops give 50 percent glucose 500 to 1,000 IV very slow drip. Diuretics are contradicated peritoneal dialysis for ureamia.

Subacute and Chronic Nephritis

These are sequel of acute phase while the symptoms are improved. There is no hematuria but edema may persist.

Clinical Features

Headache, vertigo, edema which maybe slight or more, weakness pallor, polyuria, shortness of breath, hypertension. All these persist and become progressive, complicate into encephalopathy, convulsions, vision is impaired, left ventricular hypertrophy and strain followed by failure and cardiac asthma, vomiting, diarrhea.

The course of the disease is downhill progressive and ultimately fatal.

Treatment

Rest, avoid alcohol, tea, coffee and tobacco and exposure to cold. Restrict proteins in diet. Fluids not more than 2000 to 3000 cc per day. Anemia to be treated with iron or if necessary blood transfusion. Antibiotics for infections and digitalis for CCF. Hi cough, muscular twitchings, fits, drowsiness, coma may occur. Osteomalacia in children called "Renal rickets." Blood urea rises quite high with creatinin, potassium rises and can cause death by acting on the heart.

Nephrosis (Nephrotic Syndrome)

This is a degenerative condition, which is associated with marked increase of permeability of glomerular basements membrane leading to proteinuria and gross edema develops due to hypoproteinemia.

Clinical Features

Onset is insidious, weakness, edema starting from face and then generalized anasarca. There is bilateral hydrothorax, ascites, there is anorexia, severe malnutrient, diarrhea, vomiting. The urine is scanty with massive albuminuria, loss of proteins maybe 20 to 50 grams per day from urine. RBC are absent. Hyaline casts are present. BP is normal or even low. Blood shows low serum proteins and high cholesterol may go even 1,000 mg percent ml. BMR is low intercurrent infections may cause death. Otherwise the condition persists for months together.

Treatment

High protein diet. Even give plasma infusions IV drip. Restrict salt and fluids to 2,000 cc per day. Diuretics are required to be given with regular intervals and if edema still persists, use corticosteroids 50 to 100 mg/day for 8 to 10 days and then suddenly stop and there will be diuresis. Such courses maybe repeated with intervals. Antibiotics are used necessarily and keep on the maintenance dose.

Renal Failure, Anuria and Uremia

When kidneys fail to do their normal functions, it is called renal failure which results into oliguria,

progressing towards anuria and also accumulation of metabolic products in the blood such as urea and therefore it is called uremia.

Causes

A. Prerenal such as loss of blood, body fluids in burns, excessive sweating, general anesthesia, serious infection, acute cardiac failure, incompatable blood transfusion which causes hemolytic crisis.
B. Renal such as acute nephritis.
C. Postrenal such as obstruction of urinary flow by renal, ureteric stones, enlarged prostate, malignancy, always give "renal colic" which is a most painful condition.

Diagnosis

History, physical exam, exam of the urine, PR, X-ray plain abdomen, ultrasound, renal biopsy, cystoscopy. Serum acid phosphatase.

Treatment

Prerenal conditions are treatable. Renal condition of acute nephritis is already described above. Postrenal requires surgery.

However, the usual treatment is complete rest, hospitalization, restrict fluids and proteins, peritoneal lavage, artificial kidney if available. If marked acidosis is there, use sodium bicarbonate 500 cc IV slowly. If anemia is severe, give packed cell blood transfusion. If infections are there give antibiotics in adequate doses for required period. Peritoneal dialysis repeatedly.

Pyelonephritis

Infection of urinary tract is very common problem. For convenience of description it is divided into upper urinary tract infection and lower urinary tract infection. Similarly, clinically it is considered as an acute phase or chronic phase.

Predisposing Factors

A. Urinary obstructive such as renal stone, enlarged prostate.
B. Non-obstructive such as septicemia, typhoid.

Source of Infection

a. Hematogenous such as septicemia and typhoid,
b. Ascending infection from lower urinary tract.
c. Through lymphatic from intestine.

Signs and Symptoms

There is fever, malaiac, headache, body aches, rigors polyurea, burning micturation, anorexia, toxic delirium, lumbar pain, hematuria, convulsions in children, renal colic if obstruction is substantial.

Treatment

After diagnosis through investigation is confirmed. Treat and remove the causative factor. Rest in bed, plenty of fluids, alkaline mixture, antibiotics to be given in adequate doses for required period. Other symptomatic treatment should also be given. Recovery is complete with correct treatment. Both medical and surgical.

Polycystic Kidneys

A congenital hereditary anomaly of the kidneys manifested cystic changes due to dilatation of collecting ducts in medulla causing pressure atrophy and fibrosis of normal tubules leading to renal failure and uremia and death other congenital anomalies maybe associated such as cystic liver.

There are infantile and adult varieties.

1. Infantile polycystic kidney, which is very rare and fatal within a year.
2. Adult variety of polycystic kidney life span is 1 to 15 years; faces are abnormal, flat nose, thick lips, puffy eyes, large low set ears and hypoplasia of lungs and congenital malformation of central nervous system, gastrointestinal tract, genitourinary tract, skeletal system. There is

polyuria, polydipsia, chronic anemia, progressing slowly over 10 to 15 years. There is retinal degeneration and diminution of vision. Hematuria, albuminuria and death is due to uremia.

Treatment

It is mostly symptomatic and prospectus are gloomy.

Congenital Renal Anomalies of Kidney

1. Unilateral kidney.
2. Floating kidney pelvic or sliding.
3. Super numery kidneys.
4. Fusion of kidneys "Horseshoe kidney."

Hematuria

When there is blood in the urine, it is called hematuria. The situation is alarming to the patients, relations and problmatic to the treating physician.

Causes

One has to locate the site of bleeding.

A. *Perennial* Blood disorders such as hemophilia etc., leukemia's purpura, Hodgkin's disease. Infections such as malaria, smallpox, etc.

Chronic infections such as sub-acute bacterial endocarditis, syphilis and TB vitamin "C" deficiency such as scurvy.

B. *Renal* Acute nephritis, calculus, pyelitis and TB, renal tumors, drugs such as salicylates barbiturates, sulphas, anti coagulants, etc.

C. *Postrenal:* Infections of bladder, calculi, malignancies, etc.

Diagnosis

It is most important. History, physical exam, PR, PV urine exam, CBC, ESR, plain X-ray abdomen, sonography, cystoscopy, urine culture and sensitivity test. Test for hemorrhagic disorders.

Treatment

Hospitalization, rest, sedatives, vitamin, calcium coagulants and if required surgery. Multiple blood transfusions.

Renal, Vesicle, Calculi and Nephrocalcinosis

Etiology is unknown.

Factors Associated with Stone Formation

A. Hot climate when excessive sweating and scanty urine and less in take of water.
B. Urinary infections, stagnation due to obstruction.
C. Hypercalciurea such as hyperparathyroidism; Cushing's syndrome, sarcoidosis, myeloma, vitamin D intoxication.
D. In certain inherited disorders such as cystinurea and hyperoxaluria.
E. Diseases where uric acid is excreted such as gout and leukemia.
F. pH of urine. If alkali for phosphate stone if the reaction of urine is acid the stones are cystine, uric acid and calcium oxalate stones.

Calculi

Ninety percent stones contain calcium, usual stones are in acid urine and they are calcium oxalate stones, cystic stones, xanthin stone, tyrosine stones, uric acid stones, leucin stones, struvite stones, crystals of the same are present in the urine.

In alkaline urine the following stones maybe found:

Calcium phosphate stones, ammonium urate stones, calcium carbonate stones are found in alkaline urine and in the urine crystals of the same are present in the urine.

Clinical Features

Depends upon size, position and shape of stone. They may exist years together and even be symptom less or they may give intermittent pain of dull type in lumber region or lower back. When small calculus passes through urater, there is a severe pain called

"Renal colic" which is so severe that it is unbearable. It radiates to groin or testis or labia in case of women; there is sweating, pallor, vomiting and hematuria.

Diagnosis

X-rays of abdomen, sonography, urine exam, IV or retrograde pyelography cystoscopy.

Treatment

Rest in bed; restrict milk and dairy products. Inject pathedine 50 (100 mg IM antispasmodic such as atropine 1/100 inj SC or IM and repeat after two hours; if necessary.

Surgery when needed, adequate fluid intake, antibiotics, analgesics, anti-allergics, anti-spasmodics required to be given. Stag horn stone is an absolute indication for surgery or even unilateral nephrectomy but many times stones pass spontaneously.

Tumors of Kidney and Urinary Tract

A. Renal carcinoma; nephroblastoma (Wilms' tumor).
B. Pelvis of kidney, ureter and bladder, transitional cell carcinomas.
C. Prostatic carcinoma.
D. Testicular seminoma, teratoma.

Obstructive symptomatology and hematuria is well discussed above.

Treatment

The only answer is surgery at the earliest. If renal failure is evident, dialysis is advisable which could be short-term or long-term.

Renal transplantation in suitable cases if donor is available.

Indications of Renal Transplantation

1. Chronic renal failure, diabetic nephropathy, age is no bar.

Contraindications

1. Active infection.
2. HIV-positive cases.
3. Disseminated malignancy.
4. Psychiatric disorders.
5. Advance cardiac, respiratory and hepatic disorder of GI tract.

Affections of Kidney in Systemic Diseases

1. Lupus nephropathy shows nephratic syndrome proteinurea and hematuria.
2. Polyarteritis nodosa when arteries are involved can be confirmed by renal biopsy.
3. Drugs, NSAIDs, gold penicillin nephropathy.
4. Rheumatoid arthritis.
5. Systemic sclerosis.
6. Dermatomyositis.
7. Leukemia and lymphoma.
8. Multiple myeloma.
9. Diabetes mellitus.
10. Tropical diseases such as filarial glomelopathy, malaria, and amyloidosis.

All these conditions involves renal parenchyma and damage both structural and functional, and needs to be kept behind the back of mind, and investigation diagnosis and treatment at the earliest to arrest the progressive damage. However, for many of them the treatment is beyond satisfaction at present.

FUTURE PROSPECTUS OF NEPHROLOGY

During last quarter of the century, there is glaring advancement in diagnostic and therapeutic scenario of renal diseases and the outlook has been optimistic. Infections both bacterial and fungal are being treatable even the drug resistance varieties both systematic or local.

The urinary tract analgesics and antispasmodics have done a lot to give substantial relief to the patients.

The outlook of renal failure is changed due to hemodialysis.

Diagnostic renal biopsies seen through electron and immunofluorescence microscopy have contributed substantially towards the better understanding and guiding the line of treatment.

Ultrasound, CT scanning and renal angiographies have made the diagnostic accuracy possible. Renal transplant is becoming possible and donors are volunteering for economic remuneration. This will totally modify the morbidity and mortality due to renal diseases, surgeons are specializing this line with bright prospectus.

Future advancement will go a long way to improve the outlook to an even greater extent.

Neurology and Psychiatry 10

INTRODUCTION

Brain is the supreme organ of the body. It is on the top, well protected by a bony skull. All centers are located in the brain. Therefore, it is called central nervous system, which is connected with all peripheral parts of body, therefore called peripheral nervous system.

It gets all the information through peripherals with the help of eyes, nose, ears, tongue, skin, so it is called afferent nervous system. This informations are stored in the brain called memory. When one is aware of the information, it is called consciousness and when unaware it is called unconsciousness or coma.

Brain has got various parts such as cerebrum containing gray and white matter, cerebellum, medulla, thalamus, hypothalamus and the hollow part called ventricles filled with cerebrospinal fluid. All these have got a variety of special functions well connected with each other like the computer.

There are two varieties of brain functions. One is voluntary and other is involuntary or automatic carried by sympathetic and parasympathetic systems.

The brain functions in the conscious stage are as follows:

1. Cognition, which signifies awareness, registrations in memory.
2. Affection is the state of feeling.
3. Conation indicates striving after due process of analysis, thinking in the mind which is the most complex expression of driving inherent force with qualities of wisdom, foresight, judgment, and to come to the decision about the response to a large extent purposive which is definite and will be of his own advantage instinctively enduced and conceived notion of self preservation.

Thalamus is concerned with emotion, nourishment and sex, hypothalamus in coordinating with voluntary and automatic neurological activities indicated by thalamus and concerned with defense and offence. The motor functions are situated in the pre frontal gyrus, feet up and head down. The brain is connected with periphery by spinal cord, well guarded by bony cage of vertebrae containing motor and sensory fiber coordinating through the reflex activity in the conscious individual.

EXAMINATION OF CENTRAL NERVOUS SYSTEM

History taking and question answers.

Inspection and palpation: See from head to foot, standing, walking and bendings laying.

See the skull; size and measure it with tape, when abnormally small, it is microcephalic,

abnormally enlarged hydrocephalus ostitis, deformans and acromegally. *The circumference of normal skull is as follows:*

Birth	–	13″
6 months	–	16″
1 year	–	18″
3 years	–	19″
7 years	–	20″
Adult	–	22″

Look for shape of skull and the sutures.

In rickets the skull is square and box-shaped and bossings are present.

In congenital syphilis the forehead is vertical, frontal eminence prominent and the bridge of the nose is depressed.

The anterior fontanel naturally closes between 10 to 14 months and posterial fontanel normally closes by 2 months. Look for spinal and other deformities.

Auscultation: Mostly forgotten but useful to auscultate eyeballs carotid arteries for murmur.

Then examine cervical nerves.

First olfactory for smell, use a bottle of clove oil, oil of paper mint and tincture asafetida to each nostril separately and record the findings.

Second nerve is optic for vision. See for acuity, field of vision, color; even counting the fingers may give an idea and also filed of vision by moving finger in all the directions; see the movements of eyeballs for nystagmus and squint and record the findings.

Third, fourth and sixth cranial nerves can be examined together:

If third nerve is paralyzed there is ptosis, pupils are dilated and there is loss of power of accommodation. Paralysis may also be partial.

Fourth nerve gives diplopia in horizontal plain and patient cannot see downwards.

Sixth nerve patient can not move eyes outwards and there is strabismus (squint).

Examination of pupils for size, mobility and reaction to light. See for Argyll-Robertson's pupils when pupils react to accommodation and not to the light, is found in neurosyphilis and other degenerative neurological diseases.

Fifth is trigeminal nerve, which has got sensory and motor fibers and maxillary and mendibular divisions. In case of paralysis, there is sensory loss on the skin of the face, mucous membrane of mouth, loss of taste, and in case of motor paralysis patient cannot clench the teeth.

Seventh is facial nerve which is purely motor and supplies the muscles of faces in case of bells palsy one side facial nerve is paralyzed and face is dragged to other side, nasolabial fold is less pronounced compared to the other side, ask the patient to close both the eyes, give a smile and blow the cheeks and diagnosis is evident.

Eighth is auditory nerve and hearing is tested in each ear separately by putting wristwatch to the ear separately use of tuning fork is very helpful. It is louder on the affected side than the healthy. Distinction requires to be made between middle ear disease and nerve deafness when tuning fork will only be heard on healthy side.

Look for abnormal auditory sensation such as tinitus, hyperacusis, ringing of bells and vertigo.

Ninth is glosso pharyngeal nerve and tenth is vagus and eleventh is accessory nerve which supplies to trapezium muscle and when paralysed, patient cannot shrug the shoulder and when sternomastoid gets affected there is rotation of chin to the opposite side.

Twelfth hypoglossal is purely a motor nerve and when paralyzed and protruded points only to paralyzed side.

Paralysis of cervical sympathetic nerves cause recession of eyeball so that it looks smaller accompanied with drooping of upper eyelid and contraction of pupil.

Motor Functions

Ask if there is any paralysis or unilateral weakness. Look for coordination by asking patient to do

actions as stated. See the nutrition and size of muscles as compared with other side. Look for any abnormal muscle movements such as myoclonus, tremor, twitching or flickering of few muscle fibers or ever-choreic involuntary purpose-like movements, which are uncontrollable.

Motor power should be tested in hands by asking the patient to squeeze your hand upper and lower limbs and to act under your antagonistic pressure activity and same with feet and legs; abdomen and head. Feeble power is called paresis if no power is called paralysis.

The term hemiplegia is called when one side of the body is paralyzed; when one side of the body and other side of face is paralyzed, it is called crossed paralysis. When paralysis is limited to lower part of the body, it is paraplegia and when only one limb is paralyzed it is monoplegia. Extensor plantar response always indicates paralytic side.

Coordination requires to be checked. When there is no coordination it is called ataxia. Finger nose test always helps for limit and with feet together and then tell him or her to close the eyes. If sign is positive patient falls of course you have to guard and protect.

Babinski's sign is important to diagnose cerebellar ataxia consisting of inability to execute rapidly repeated movements such as pronation and supination of forearm.

Atrophy or wasting indicates impaired nutrition of muscle affected, always compare with other side. Tone of the muscle is important when increased hypertonia and spasticity when diminished hypotonia. This can be decided in passive movements by the examiner.

Spastic disorders are due to damage to the pyramidal tract. When shortening of muscle is permanent, it is called contracture present in long standing cases of spastic paralysis.

Illicit Kernig's sign by flexing the thigh and then try to extend the knee which is not possible in cases of meningitis.

Abnormal movements as mentioned above are significant.

1. Spasm exaggerated involuntary contraction has got two varieties if continuous "tonic" and if interrupted "clonic" as seen in tetanus, strychnine poisoning hydrophobia (i.e. rabies and tetany); and occupational cramps as seen in telegraphists and violinists.
2. Oculogyral crisis seen in encephalitis lethargica when ocular movements are upwards and one may see myoclonus (shock like contractions of muscles).
3. Tremors or the rhythmical oscillation of part of the limb. They maybe fine or coarse as seen in thyrotoxicosis, Alcoholics and some positions. These can be elicited by extending the arms in front and putting a paper sheet on it.
4. Fibrillary twitchings are seen in progressive muscular atrophy.
5. The choreic involuntary purpose-like, abruptly repeated movements are well evident on watching. Common in rheumatic disease called Sydenham's chorea or in children other cerebral diseases such as Huntington's chorea. Common in adults.
6. Athetosis where there are repeated twisting involuntary movements specially affecting hands and feet, results from hypoxia or birth injuries or trauma.
7. Tics usually seen in blinking of eyes or smacking of lips or nodding of head which may become habitual and involuntary and is mostly psychogenic and always misunderstood.

Sensory Functions

1. Tactile sensibility.
2. Pain.
3. Thermal.
4. Sense of position.
5. Recognition of size, shape and form.
6. Appreciation of weight.
7. Appreciation of vibration.

Loss of Sensation is called Anesthesia

If altered or exaggerated called hyperesthesia. If delayed conduction to the stimulus exists in alcoholic neuritis or tabes dorsalis. Thermal sense is lost in leprosy and sense of position, size, shape, and weight is diminished or lost in parietal tumor.

Loss of vibration sense is seen in tabes dorsalis in peripheral neuritis and even in diabetic neuropathy. If patient feels abnormal sensation without stimulus it is called paresthesia, which includes pins and needles, numbness, burning in chills, itching or feeling of crawling of insect. All are mostly psychogenic in origin.

Reflexes

1. Superficial.
2. Deep or tender reflexes.
3. Organic such as action of sphincters such as urinary and anal sphincters.

Most important is plantar reflex when sole is scratched; the toe goes up in case of pyramidal leasion.

Abdominal reflex is also important when absent indicates pyramidal tract leasion.

Conjuctival reflex, "Argyl Robutson Pupil" when the reaction to light is lost is diagnostic in tabes dorsalis.

Knee jerk speaks about third and fourth lumber spinal segment.

Ankle jerk tells about 1st and 2nd sacral segments.

Triceps jerk 7 and 8th cervical segment.

Biceps jerk 5th and 6th cervical segment.

Ankle clonus is an important sign of disease of 1st to 3rd sacral segments.

The organic reflexes such as deglutition, defecation and urination are known by enquiring the patient.

DISEASES OF CENTRAL NERVOUS SYSTEM

Congenital and Diseases of Unknown Etiology

A. Motor neuron disease.
B. Hereditary ataxia.
C. Syringomyelia.
D. Neurofibromatosis.

Motor Neuron Disease

Etiology unknown: There is progressive bulbar palsy of insidious onset more common in men between age 40 and 60 years, manifesting as dysarthria, dysphasia, dysphonia, i.e. difficulty in speaking, swallowing and hoarseness of voice, wasting and fasciculation of tongue followed by spasticity presenting as amyotrophic lateral sclerosis, progressive muscular atrophy or progressive in character where there is weakness, painful cramps in the legs and fasciculations.

Treatment: Usually symptomatic, steroids are tried but are not much helpful, walking aids physiotherapy to be carried out. Death is inevitable.

Hereditary Ataxia

It is a hereditary disorder, which presents various types of clinical pictures of ataxia, change of gaits intention tremors, dysarthria, nystagmus spastic paraplegia, optic atrophy and loss of bladder control. All these disorders are slowly progressive for a long time.

Syringomyelia

There is cavity in the central canal of spinal cord onset insidious and there is disassociated sensory loss, pain and temperature while touch and vibration sense is preserved. There are trophic lesions upward extension of disease called syringobulbia causing sensory loss of face. Horner's syndrome and nestagmus needs special investigations.

X-ray; myelography, pneumoencephalography is helpful.

Treatment: Mostly symptomatic and palliative till patient survives.

Neurofibromatosis (von Recklinghausen's disease)

There are multiple tumors from the sheath of peripheral nerve roots and cranial nerves.

Spinal and craineal varieties requires surgery.

Surgical excisions of cuteness fibrometas are tried occasionally. There is a chance of malignancy (sarcoma).

Demyelinating Diseases and Diseases of Extrapyramidal System

A. Multiple sclerosis.
B. Acute demyelinating encephalomyelitis.

Multiple Sclerosis

Multiple sclerosis known as disseminated sclerosis quite common in temperate climate but rare in tropics. It runs a relapsing and remittent course with symptomatology.

Onset is before puberty and is more common in girls. May start as transient blindness in an apparently healthy girl. Then comes retro bulbar neuritis, diplopia, vertigo, ataxia followed by complete recovery period, remains well for varying periods and then exacerbation and relapse with increasing disability. There is pallor of one or both optic discs to temporal side. Nystagmus is present. Motor disturbance come up afterwards, absence of abdominal reflex; spastic paraplegia signifies progress cerebellar signs come up, scanning speech, ataxia, tremors are usually found. There is euphoria.

Treatment: It is symptomatic and physiotherapy steroids modify the acute exacerbations but do not alter the prognosis; disability is certain and outlook is gloomy but course of the disease is very long with intermissions and striking improvements off and on.

Acute Demyelinating Encephalomyelitis

As the name suggest, there is demyelination of wide areas of brain and spinal cord followed after bacterial or virus infection of upper respiratory tract, maybe due to sensitivity reaction.

The symptoms appear 10 to 12 days of infection or vaccination. Fever, headache, vomiting delirium, fits and coma may occur; retension of urine may come up.

Treatment: ACTH 80 to 120 units inj or prednisone 6 mg by mouth for several days followed by maintenance dose for 2 to 3 weeks is beneficial. Hospitalization, competent nursing, antibiotics and anti-allergic umbrella are necessary. Mortality though high but if survives the recovery is complete and second attack is very rare.

Diseases of Extrapyramidal Systems

A. Parkinson's disease.
B. Wilson's disease.

Parkinson's Disease

The control over voluntary movements is altered along with increasing in tone rigidity and tremors, usually appears in those over 60 years of age.

The lesions are in the interconnecting system between substantia nigra and corpus striatum. It is really due to dopamine deficiency.

Etiology: Unknown in many cases, in some of it is followed after encephalitis lethargica, virus infection, arteriosclerosis, drugs such as reserpine and head injury, tremors, syphilis poisoning due to carbon monoxide, manganese or copper deposition in Wilson's disease.

Clinical features: This is disease of old age, on set is insidious and starts with tremors which are coarse, slow and rhythmic, present at rest. Rigidity may even be seen early giving resistance to passive movements along with fixed postural abnormalities. Movements are slow, lack of precision and affects the hand writing, feeding and turning over in bed becomes difficult. Getting up from chair and walking becomes slow, flexed at neck, hips, knees and elbows. Steps are small and there is loss of

normal arm swinging. Passive movements show "cog-wheel" phenomenon. The face is expressionless, blinking is reduced, and conjugate upward deviation of eyes called oculogyric crises may last for some time. Speech is affected and there is dysarthria.

Diagnosis: History and clinical manifestations are adequate for diagnosis and other investigations are inconclusive and unnecessary.

Treatment: It came in tumor surgical excision. If syphilis is there, Pan-penicillin course relieves the symptoms.

Mostly, the treatment is to ameliorate the disability.

a. *Levodopa*

It offers symptomatic improvement in dose 25 mg/day after meals in the beginning and thereafter gradually increase in due course up to 1.8 gm/day.

Contraindications: Glaucoma, psychosis, melanoma.

Side effects: Nausea, vomiting, hypertension, urine discoloration.

Preparations used in practice:

1. Tab Tsidopal 500 mg (Glaxo-SmithKline)
2. Tab Levodopa 500 mg.

b. *Carbidopa and Benserazide*

Used when response to levodopa is inadequate. The joint preparation used in practice are as follows:

1. Tab duodopac (Levodopa 250 mg + Carbidopa 20 mg) (Merind).
2. Tab Duodopac (Levodopa 250 mg + Carbidopa 20 mg) (Wallace).
3. Syndopa (Levodopa 250 mg + Carbidopa 20 mg) (Sun Pharma).
4. Tidomet Forte (Levodopa 250 mg + Carbidopa 250 mg) (Torrent).

c. *Tetrabenzine used when dystonia or Myoclonus*

Dose: 25 mg/day maximum up to 200 mg/day

Contraindications: Pregnancy, lactation hypotension.

(Reduce the dose of levodopa) Psychiatric symptoms

Latest most encouraging news is from Japan CoTT University Research Scholar Dr. June Taka Hauni says that a basic cells mass can be implanted. In human brain from the off springs omnitic cells are implanted. They are not only taken up but cause immune favorable improvement in the parkinsonism. He is confident about the further use of this technique in patients of "Parkinson's disease."

Case of parkinsonism therefore will be immensely benefited in future if the experiment comes in common practice.

Preparations used in practice are as follows:

1. Revocon tab 25 mg (Sun Pharma).

d. *Selegiline:* It works as adjuvant to levodopa and is more effective.

Dose: 10 mg/day

Contraindications: Epilepsy

Dose to be reduced in elderly.

Side effects: Hypotension, nausea, pychosis

Preparations used in practice are as follows:

1. Tab Elegelin 5 mg (Sun Pharma).
2. Tab Eldepryl 5-10 mg (Themis-Chemical).
3. Tab Jumax 5 mg (Torrent).

e. *Bromocriptine:* Prompt acting drug. Used alone. Expensive, side effects are severe and therefore, start with lowest dose and can be used with Levodopa.

Dosage: 1.25 mg (1/2 tab) daily with meals.

Increase the dose after 2 to 3 weeks by 2.5 mg/day, i.e. one tab.

Side effects: Vomiting, hypotension, constipation, nasal stiffness, headache, drowsiness.

Preparations used in practice are as follows:

1. Tab Bromoegen 1.25, 2.5 mg (UNI-Sankyo).
2. Tab Parlodel 2.5 mg (Novartis).
3. Tab Proctinal 1.25; 2.5 mg (Glaxo-Smithkline).

f. *Central anticholinergics:* It is better than atropine; tremors are benefited more than rigidity. It is cheap and has minimal side effects than levodopa, but can be continued with it.

Contraindications: Glaucoma, urinary retension, tachycardia and enlarged prostate paralytic ileus.

Dose: 2 to 10 mg/day in divided doses.

Preparations used in practice are as follows:

1. Tab Hexinal 2 mg (Torrent)
2. Tab Bexol 2 mg (Intas)
3. Tab Parkitone 2 mg (Sun Pharma)
4. Cap Amantrel 100 mg/day or twice a day (Protac Cipla) maybe tried if tolerable.

Prognosis: It is variable, they do not become completely normal although there is evidence that their life expectancy is increased. Accidents are not uncommon.

CEREBROVASCULAR DISEASES

Cerebral Atherosclerosis and Ischemia

Brain is supplied with about 1/5th of cardiac output per minute through carotids and vertebral arteries. When this blood flow is reduced due to various causes partially due to narrowing of arteries or obstruction due to thrombosis it causes cerebral ischemia or infarction.

Reduction of blood flow to the brain may occur due to hypotension arteriosclerosis cardiac arrhythmia, anemia and thrombosis due to polycythemia atheromatous plague and filling, platelet and lipid emboli.

The ischemia or infarction is usually localized giving rise to clinical features depending upon the area of the lesion. Collateral channels in the supply mechanism is there to counteract but sudden blockage is more likely to produce infarction than the gradual reduction of an arterial lumen which allows the time factor required for opening of the collateral channels.

Transient cerebral dysfunction occurs even due to arterial spasm such as migraine, angiographies, brain surgery and subarachnoid hemorrhage but usually there is no infarction.

Arteritis due to syphilis, systematic erythematous or polyarteritis reduces the blood flow to the brain and can occasionally cause cerebral infarction.

Cerebral Thrombosis and Embolism

An atheromatous change in central arteries is very common over the age of 60 years. Thus, the narrowing of arteries, predispose thrombosis. The atheromatous plaque may come from carotid arteries aorta and may block small cerebral arteries causing thrombosis infarction or the narrowing causes generalized progressive loss of brain tissue and impairment of cerebral function.

Cerebral Thrombosis Causes

1. Stroke due to infarction because of thrombosis, hemorrhage, tumor.
2. Stroke in evolution.
3. Transient ischemic attack.
4. Progressive defused loss of cerebral function

Clinical Features

Onset is within few months or can occur in 1 to 2 days. Starts with headache, fits, drowsiness and occasionally coma. Neurological signs and symptoms depend upon the site of leasion. Middle cerebral artery is commonly involved causing hemiplegia of the opposite side with paralysis, loss of half visual field and hemianopia. If infarction is on dominant hemisphere there is dyspnea. Other symptoms such as diolopia, nystagmus, alexia, hemanopia, depends on various other arteries involvement.

The stroke evolution is rather slow in speed 3 to 4 days and 1 to 2 weeks and usually due to tumors. Transient ischemic attacks are evident by transient loss of vision or block out hemiparesis,

vertigo, diplopia, intermittently with full recovery in between usually due to break down in emboli or even reduced cardiac output that can cause the transient syndrome or defused cerebral arteriosclerosis which affects the cerebral blood flow adversely causing the lowered cerebral intellectual function and multiple motor defects leading to cerebral atrophy and dementia.

Hemorrhagic Cerebral Lesions

Mostly severe hypertensions develop arteriopathy and they rupture and cause bleeding in brain. Long standing high blood pressure changes the muscular and elastic layers of giving rise to small aneurysms liable to rupture; the commonest site being the internal capsule generally when patient is doing physical exertion, exercise or games. When the bleeding process goes on the CSF may contain blood. Prognosis is grave and death is inevitable.

Subarachnoid Hemorrhage

It is due to vascular rupture of aneurysms of anterior, middle and postal cerebral arteries. They give rise to focal signs and symptoms according to the site of region. Sometimes, the internal carotid artery branches ruptures in caverness sinus causing fistula, giving rise to severe pain in the eyes, pulsating exophthalmos, papilledema, complete ophthalmoplegia and a loud murmur is heard over the affected eye. The cerebral neurons may get affected and slow palsy with contralateral pyramidal signs.

Subdural Hematoma

Usually occurs due to head injury and it is due to venus bleeding causing subdural blood clot which enlarges in weeks and months and give rise to the signs and symptoms according to sites and can easily be confused with tumor.

Diseases of Intracranial Veins and Venous Sinuses

Causes

1. Septic venous thrombosis may cause cerebral abscess, meningitis and suppurative encephalitis.
2. Thrombus coming from deep veins of the legs.
3. Dehydration polycythemia, leukemias, malaria and venous thrombi passing through vertebral venous plexus. In case of superior segital venus sinus infection may travel through nasal sepsis. The transverse sinus thrombosis infection is transferred through supurative middle ear disease.

Diagnosis and Treatment of Cerebrovascular Diseases

1. Clinical exam of central nervous system cardiovascular system in detail.
2. Examination of CSF, CBC, ESR, VDRL and HIV
3. X-ray of the skull, CT scan, EEG and ratinoscopy are essentially helpful.
4. Cerebral angiography if surgery is contemplated.

Treatment

1. Symptomatic.
2. Radical—Remove the cause, treat syphilis, malaria, anemia, dehydration and infections with the help of required medicines. Medicines should be given in proper doses after establishing the diagnosis, quite promptly.

The subdural hemotoma is aminable to surgery and if done early, gives complete cure.

Embolectomies and tumors require expert assessment and availability of the facility of microscopic surgery in the super specialized institution where early and exact diagnosis possible and prompt proper treatment can be undertaken.

INFECTIONS OF THE BRAIN, MENINGES AND SPINAL CORD

Source of Infection

1. It is usually direct from skull infected middle ear disease, paranasal sinuses from lungs and from heart in case of sub-acute bacterial endocarditis, pneumonia, osteomyelitis, boils and septic wounds.
2. TB usually from lungs but can be from any focus from where the septic emboli cause the localize abscess or military TB.
3. Syphilis, HIV (venereal diseases) and viral diseases, fungi.

Clinical Features

1. In acute supportive infection there is high temperature, headache, vomiting, drowsiness leading to coma. There are focal signs present as per the site of infection.
2. In chronic diseases, tuberculosis is very common. Shows fever with evening rise, cough with purulent sputum, tachycardia, loss of weight, anorexia and general weakness, Pespiration on forehead.
   X-ray chest, sputum for acid fast bacteria give positive diagnosis. Anti-TB treatment is effective.
3. *Syphilis:* It is amendable to Pam-penicillin injection course.

TB Meningitis It is not uncommon, presenting in children, but there is no age bar. The onset is insidious and slow, fever anorexia, general weakness, loss of weight and rigidity of the neck develops, tubercles maybe seen by retinoscopy, even before CSF gives positive results. Thereafter, convulsions develop. There is confusion, drowsiness and may lead to coma.

The CSF shows dominant lymphocytes and residue can show acid-fast organisms.

Neurosyphilis

Clinical Types

1. Tabes dorsalis.
2. General paralysis of insane (GPI).
3. Primary optic atrophy essential lesion is syphilitic endarteritis, thrombosis, and formation of gumma. It can cause cerebral thrombosis, stroke, basal gummatus meningitis, hypertrophic patchy meningitis menigomyelitis, and general paralysis of insane, progressing to dementia.
   CNS is attacked in the tertiary stage of disease.

Onset is slow but progressive. Cerebral deficiency in social adoptation and also is transient episodes of dysphasia, hemianopia, hemiplegia and sometimes epileptic fits.

Tabes Dorsalis

Syphilis affecting sensory neurons, dorsalroots ganglia in the lower thorasic and lumbar nerve roots. The syndrome of tabes dorsalis appear.

Clinical features: Lightening pains, girdle pains, tabetic crisis and feeling of walking on cotton wool. There is hypotonia, ataxia, loss of knee and ankle jerks, Argyll-Robertson's pupils where pupils' reaction to light is lost. There is dysurea, trophic ulcers on greater toe and pupils' reaction to light is lost. There is dysurea. Charcot's joints, which are painless and there is stamping gait.

Treatment: Courses of pam-penicillin, physiotherapy and treatment of local trophic ulcers by surgical dressing.

General Paralysis of Insane

Clinical features: Due to affection of gray matter of the brain. The higher cerebral functions are affected. There is depression, melancholia, maniacal episodes are common. Speech slurred, micrographia, motor weakness, planter extensor, Argyll Robertson's pupils and transient attacks of aphasia, monoplegia

or hemiplegia maybe seen. There is change in behavior and symptoms of psychosis appear.

Treatment: Courses pam-penicillin, iodides by mouth, malarial therapy if possible.

Primary Optic Atrophy

A very rare complication. Field of vision is gradually narrowed. Ultimately, there complete blindness. Usually it is unilateral and starts with retrobulbar neuritis. Pencillin therapy retards the progress, but complete cure is not possible. Other eye may also get affected subsequently.

HIV Infection of CNS

The clinical picture is similar but appears late. Mean while because of loss of resisting power of the patient inter-current diseases like TB, pneumonia, etc. supervenes and death may occur because of these complications. Rarely, the patient may reach when cerebral symptoms supervene which are same as mentioned above and ultimately the state of dementia may prevail, which is quite rare.

Viral Cerebral Infections

Following clinical varieties are seen:

A. Viral cerebral encephalitis.
B. Poliomyelitis.
C. Herpes zoster.

Certain viral infections are neurotrophic, having selective affinity, such as zoster virus, which invades sensory neurons, polio which affects motor neurons of anterior horn cells.

Occasionally these may involve the whole nervous system widely causing encephalitis, meningitis as complications of viral infections of other organs such as measles, mumps, viral hepatitis, psittacosis.

Viral Cerebral Encephalitis

All viruses invade meninges and give rise to encephalitis. There is diffused damage of the cells of the cortex, basal ganglia and brainstem. Herpez encephalitis affects the temporal lobe and encephalitis lethargica affects the basal ganglia, substantia nigra and mid brain.

Clinical features: Acute onset with fever, headache, drowsiness, confusion and then coma. Dysarthria, diplopia, rabies encephalitis is always fatal.

Treatment: Hospitalization, nursing care, prevention of inter-current infections and drugs such as idoxuridine 500 mg/kg. Slow IV in divided doses for five successive days maybe helpful.

Prognosis: It is variable and depends upon virulence of virus and the stage of duration of epidemic because in the start of epidemic the prognosis is grave and at the end of epidemics the patient may survive with residual disability and morbidity.

Recurrence is usually rare.

Poliomyelitis

The infection occurs through nasopharynx. It has got affinity to anterior horn cells in lumbar segments.

Clinical features: Incubation period is 7 to 14 days. Initially there is a mild fever, headache, neck stiffness and weakness in the lower limbs leading to paralysis. If, thorasic segments get affected, involving intercoastal muscles, the patient gets respiratory failure and an emergency arises for tracheostomy to be done along with pushing the patient in the artificial respirator. Recovery is gradual in about 3 to 6 months, but rarely complete. Residual disability and morbidity do remain.

Herpes Zoster

Virus invades posterior roots ganglia followed by a rash over the cutaneous distribution and occasionally virus may invade spinal cord or brain causing encephalomyelitis.

Clinical features Severe cutaneous pain in the area of distribution fibers of the nerve root. There is fever,

bodyache and cutaneous area becomes red and vesicles appear. Which get dried up after about a week, living pigmented marks on the skin. The pain usually subsides but in elderly neuralgia may remain for months and years. The ophthalmic invasion of the virus can cause cornial opacity and loss of vision. If geniculate ganglia invade there is facial palsy. Apart from symptomatic treatment, the drug cytarabine maybe used with advantage, which modifies the course and reduces the symptoms.

EPILEPSY

An attack of fits or convulsions due to over activity by the set of neurons in the brain.

Clinical subdivisions are as follows.

Idiopathic

Age below 20 years; no sex differentiation. Family history positive, predisposed by emotional upset or fright associated with loss of consciousness.

Clinical Varieties

a. Grand mal.
b. Petit mal.
c. Temporal lobe epilepsy.
d. Jacksonian epilepsy
e. Status epilepticus.
f. It maybe generalized or focal.

a. *Grand mal:* Prodromal stage and aura is short and vague, followed by tonic stage of fits with unconsciousness. Patient may fall, there is substantial tonic spasm of all the musculature including respiratory and air is expired forcibly through the half closed glottis, giving sound of "cry" lasting for few seconds. In clonic phase, which is short lived, and fits give place to jerking movements and tongue maybe bitten. There is frothy saliva in the mouth. This is followed by a stage of relaxation where fits disappear, patient lies flaccid and sleeps for about an hour or less and patient regains consciousness but remains confused with headache.

Petit mal: In this disorder, there is transient loss of consciousness during which patient looks blank for 10 to 15 seconds. This is a dramatic episode and may pass unnoticed. It is common in childhood but may extend during adolescence. Rarely myoclonic jerking arm is seen and the patient falls on ground but recovers soon and gets up.

Temporal lobe epilepsy: The hallucinations of smell predominate less commonly than taste, hearing and sight. Associations of emotional outbrusts are seen. Patient passes through dreamy state and may do any activity even violence without any remembrance afterwards.

Jacksonian epilepsy: Involuntary twitching of clonic types in the limbs bilaterally with or without loss of consciousness and thereafter, these parts become normal but paralysed called "Todd's palsy."

Treatment

It is always safe to protect the patient from driving vehicles, machine work and fire. During the attack even when aura make the patient lie down and keep mouth gagged to protect the tongues and give the patient a dose of anti-convulescent drug and tranquilizer, even by injection.

The time-honoured regime is phenobarbitone 30 mg tds with phenytoin 100 mg tds dose help to prevent the fits to the greater extent to be continued for 2 to 3 years.

Other anti-convulescents used in practice are as follows:

1. *Carbamazepine:* It is anticonvulsant and antidepressant and psychotrophic activity and help in cases of trigerminal neuralgia and alcohol withdrawal syndromes and diabetic neuoropathy.
   Dose: 200 mg od or bd to be gradually increased 20 mg/kg of body weight.
   Side effects: Anorexia, dryness of mouth, diarrhea or constipation, headache, dizziness, ataxia 7 visual disturbances.

Drugs used in practice are as follows:
1. Tab carbodoc 200 mg (Cadila H).
2. Tab carbatol 100 to 200 mg (Torrent).
3. Tab zeptol 100, 200, 400 mg (Sun Pharma).

2. *Sodium valproate:* It is a very potent anti-convulescent. It is more useful in treating petitmal and also an adjuvant in treating all the other forms of epilepsy.
Dose: 600 mg/day in divided doses can be increased the dose with short intervals till proper relief is seen.
Contraindication: Hepatic deficiency.
Special precaution: Mentally retarded children and in pregnancy and lactation, better the drug to be avoided.
Side effects: Anorexia, vomiting, drowsiness, atonia, rashes, thrombocytopenia, edema and hepatitis.

Drugs: Used in practice are as follows:
1. Tab incorate 200, 500, and also syrup 200 mg/5 ml (Sun Pharma).
2. Liquid valparin 200 mg/5 ml (Torrent).
3. Tab valpol 200 mg (Intas).
4. Tab valtec 200, 300, 500, syrup 200 mg/5 ml (Cipla Protac).

3. *Hydantoins (Phenytoin)*
Indications: Grand mal, migraine, trigeminal neuralgia, digitalis induced cardiac arrhythmias.
Dose: 100 mg tds after food maximum 600 mg/day in children 4 to 7 mg/kg.
Side effects: Gum hypertrophy, hirsutism, acne, rashes, ataxia, vertigo, diplopia, nystagmus hypotension.
Drug interaction: Avoid anticoagulant, oral contraceptives, chloramphenicol and rifampicin.

Preparations used in practice are as follows:
1. Capsul Dilantim 100 mg, syrup or suspension 100 mg/4 ml (Parke Davis).
2. Tab Epilan 50, 150, 1000 mg (AFD).
3. Tab Epsolin 100 mg inj 50 mg/ml (Cadila H). Tab Phental (Phenobarbitone 30 mg and Phenytoin 100 mg) (Intas).

4. *Clonazepam*
Indication: Grand mal, temporal lobe epilepsy and myoclonic epilepsy, infantile spasms.
Dosages: 0.01 to 0.03 mg/kg/day in 3 to 4 divided maybe reduced in elderly 20 if tolerated and maintenance dose 4 to 8 mg/day.
Contraindications: Respiratory deficiencies and insufficiency, alcoholism.
Side effects: Weakness, lethargia, ataxia, drowsiness, vertigo, depression, nausea, vomiting, dyspepsia.

Preparations: Used in practice are as follows:
1. Tab Clonotril 0.5, 2 mg (Torrent).
2. Tab Lonazep 0.5, 2 mg inj 1 mg/ml (Sun Pharma).
3. Tab Ozepam 0.5; 2 mg (Ipca).
4. Tab Petril 0.5 mg (Microlab).

5. *Gabapentin:* A valuable addition to other drugs for better control particularly in tonic-clonic fits.
Dosage: 800 to 1800 mg/day in 3 to 4 divided doses to a maximum dose of 2400 mg/day it should not be discontinued abruptly.

Preparations: Used in practice are as follows:
1. Capsules Gabapentin 300, 400 mg (Sun Pharma).
2. Capsule Neurontin 300, 400 mg (Park and Davis).

6. *Lamotrigine:* A novel drug and can be used as adjuctive therapy in adults.
Dosage: Start with 50 mg/day for 2 weeks then 100 mg in divided doses/day for two weeks. Thereafter further increase to maximum till optimum response is gained.
Dose: Maybe reduced when it is given with other drugs. It is not recommended in elderly patients.

Preparations used in practice are as follows:

1. Tab Lametec 25, 50 100 mg and dt 5 mg (Cipla).
2. Tab Lametor 50, 100 mg dt 5, 25 mg (Torrent).

5. *Divalproex*

Indications: Useful in optimal, adjuvant in grand mal psychomotor and myoclonic and temporal lobe epilepsies migrain and mania.

Dosage: 15 mg/kg/day to start with may go up to 50 mg/kg/day.

For mania 750 mg per day in divided doses.

Contraindications: Liver deficiency, mentally retarded children and pregnancy.

Side effects: Anorexia, vomiting, drowsiness, ataxia, loss of hair, rashes, edema.

Preparations used in practice are as follows.

1. Tab Valance 125, 250, 500 mg (Nicholas)
2. Tab Divaa 250, 500 mg (Intas).

NUTRITIONAL NEUROLOGICAL DISEASES

A. *Avitaminosis causing lesions in brain.* Vit. B_{12} neuropathy (subacute combined degeneration).

B. *Avitaminosis affecting peripheral nerves along with brain.* Vit B_1 deficiency causing beriberi and burning feet syndrome, Wernicke's encephalopathy.

The nerve cells recovering power is limited and therefore, cure is delayed even after replacement of vitamin and some times the damage is irreversible and recovery therefore, is incomplete.

Vitamin B_{12} Neuropathy (Subacute Combined Degeneration)

Daily requirement of Vit. B_{12} is about 1 microgram. In deficiency causes degeneration of posterior columns and pernicious anemia.

Etiology: Dietic deficiency of B_{12} is about 1 microgram. In deficiency causes degeneration of posterior and lateral columns of spinal cord together with perpheral neuropathy and pernicious anemia.

Etiology: Dietic deficiency of B_{12}, partial gestrectomy and malabsorption syndrome.

Clinical features: Tingling numbness of toes and then fingers, hands and feet are cold. There is difficulty in holding small objects. When disease progresses there is weakness and ataxia.

On examination "stocking and glove" anesthesia which extends upwards, tenderness of muscles of calves. Sense of position and vibration is lost and there is sensory ataxia. Ankle jerks are lost and after when disease progresses, the knee jerks are also lost. There is primary optic atrophy and mental impairment.

Diagnosis: CSF normal. There is achlorhydria and there is megaloblastic anemia, serum B_{12} is low. Typical glossitis is seen.

Treatment: Large doses of vit B_{12} for long time. Till the symptoms improve and then keep up maintenance dose for rest of the patient's life. In untreated cases, the damage to the nerves is irreverseable and death is within a couple of years.

Vitamin B_1 Deficiency

It causes the condition known as beriberi, which has got two clinical varieties viz. dry beriberi and wet beriberi.

Dry Beriberi

Dry beriberi where initially peripheral nerves of legs are involved followed by those of arms. There is paresthesia, wasting and weakness of the muscles. There are bilateral loss of sensory and wasting and weakness, distal segments of hands and feet. There is degeneration of myelin sheath of the peripheral nerves, which extends further and affects axis cylinder also. There are cramp in legs, burning doles along numb ness and tender calves, later there is foot drop and wrist drops and there is shuffling gait.

Wet Beriberi (Dry and Wet)

There is bilateral symmetrical impairment of motor, sensory and reflex function starting from distal segments of limbs along with changes in cardiovascular system by high output cardiac failure causing dyspnea palpitation and generalized edema. Right side of the heart is more affected; there is tachycardia and there systolic murmur. Hands and feet are warm and not cold seen in CCF.

Wernicke's and Korsakoff's Syndrome

Both of these are associated with chronic alcoholism and due to Vit. B_1 (Thiamine) deficiency. There is ophthalmoplegia, ataxia, mental confusion, nystagmus and patient cannot walk without support.

Replacement of vit B_1. There is dramatic change in ophthalmic disability. But in Corsakoff's psychosis, there is retrograde amnesia and confabulations, which are irreverseable, even with treatment.

Treatment: Inject 50 to 100 mg Vit. B_1, per day IM till patient improves and then maintenance dose 5 to 10 mgs tab per day and continue it. Wet beriberi the outlook is optimistic and improvement is dramatic while polyneuropathy takes weeks and months for relief.

Drugs commonly used in practice: Tab Benuron Forte 1 bd for 4 weeks and 1 tab maybe continued daily for few months. Inj Neurobion 2 ml IM daily for 10 days and then alternate day 10 days injections. Then twice a week for few weeks and then 1 weekly for few weeks.

TUMORS OF BRAIN AND SPINAL CORD

Some of the important tumors are mentioned below:

Benign

1. Meningioma.
2. Astrocytoma.
3. Choroids Papilloma.
4. Hemangioma.
5. Lipoma.
6. Dermoid and epidermoid tumors.
7. Neurofibromatosis.

Malignant

1. Astrocytoma grade 1 to 4.
2. Glioblastoma.
3. Medulloblastoma.
4. Neuroblastoma.
5. Angiosarcoma.
6. Meningeal sarcoma.
7. Teratoma.

The account for 2 percent of deaths. They are either benign or malignant or metastatic. About 50 percent peculiarity is that they grow within skull and causes displacement and invasion of the cranial contents and symptoms depend upon their site, rate of growth, type of tumors for assessing the possibility of complete excision.

The tumors from glial cells are commonest for example, the astrocytoma grade—1 is a very slow growing infiltrative which may spread widely for years before causing serious disability. Astrocytoma grade 4 is a very malignant fast growing tumor, which shows a rapid clinical picture. Other types of tumors show various manifestations and they account for about 25 percent of the tumors other tumors such as edenoma of pituitary of cranial nerves are well diagnosed early and are completely excisable surgically.

Minigiomas are benign, encapsulated and are completely removable.

Clinical Features

Occurrence at all ages but maximum after the age of 50 years. Medulloblastomas are frequent in children. Acoustic neuromas found between 30 to 50 years of age.

The clinical picture depends upon site of tumors and alteration of intracranial pressure. Sites in

various lobes of brain cause dysfunction of that region. Lesions in prefrontal lobe causes psychiatric disturbances and intellectual impairment.

Pre-central gyrus lesions cause epilepsy, monoplegias parietal lobe tumors present Jaksonion epilepsy apraxia (loss of ability to perform the movement), agnosia (Loss of ability to recognize). Patient may neglect, the sensory attention and receptive dysphasia and disturb the spoken or written speech. Patient also looses the ability to count or recognize. Deeper parietal lobe affect the optic radiation and cause contralateral visual disturbance.

Occipital lobe lesions can cause contralateral visual disturbances.

The temporal lobe lesions may cause visual and auditory hallucinations and illusions. Patient remains in a dreamy state. If on the dominant side patient develops dysphasia.

Symptoms of increased intracranial pressure, severe headache and vomiting and visual disturbances are seen when intracranial pressure is reduced by lumbar puncture and the patient gets relief.

Diagnosis

CSF protein is increased, tumor cells are identified, X-ray skull, erosion, erosions of clinoid process. Funduscopy, papilledema, EEG is abnormal and site indications, CT scan specific site demarcations.

Ventriculography determines the bulgings phenomenon and pneumo-encephalography and echoencephalography, arterial angiography, demarking the site, radioisotope encephalography is helpful.

Biopsy

The decision is left to the neurosurgeon. Search for primary site in case of metastatic through specialized examination and investigations.

Treatment

Medical treatment is symptomatic and palliative. The intracranial pressure maybe relieved by repeated lumber punctures. The cytotoxic drugs are in experimental phase.

Surgical interference is left to neurosurgeons.

Microscopic surgical arrangement is desirable.

Infective granulometus such gumma and tuberculoma requires standard treatment before and after surgery.

Prognosis is variable but look is improved when there are facilities for early diagnosis and arrangement for excision of the benign tumor neurofibrometas and cysts, etc. with the help of microsurgery in the well equipped superspeciality institutions in experienced neurosurgical hands. The success is usual.

DISEASES OF MYONEURAL FUNCTION AND MYOPATHY

Under this group, we include myasthenia gravis and myopathies, which are as under:

A. Congenital myopathies.
B. Metabolic myopathies.
C. Inflammatory myopathies or myositis.

Myasthenia Gravis

There is failure of transmission of impulses at myoneural junction. Thereby undue fatigue ability of certain group of muscles in not being able to carry out sustained normal activity.

Etiology: Unknown, theory of autoimmune reaction is being contemplated.

Clinical Features

Common in 2nd to 5th decades of age, fairsex. Symptoms being ptosis and diplopia, followed by weakness in chewing, swallowing, speaking and moving the limbs comes up afterwards. All these symptoms are more prominent in the evenings. Rarely the respiratory muscles get involved. In those cases causes respiratory failure.

Treatment

A. Neostigmine 15 mg tab 1 qds.
B. Pyridostigmine 60 mg 1 tab tds.
C. Thymectomy is widely accepted. If thymoma the surgery is must. Remission of disease after surgery are not uncommon.
D. *Corticosteroids:* Prednisolone 1 mg/kg/day in single dose, if symptoms are worse. It can also be given in small doses such 20 mg/day and gradually built up to the full calculated dose, maintenance dose to be continued for months and years. It is indicated in patients having severe symptoms only. Side effects of corticoids requires to be carefully watched.

Side effects of drugs: Vomiting, excess of saliva, sweating, diarrhea, but all are treatable.

Drugs at hand for use in myasthenia gravis.

Pyridostigmine bromide. An oral drug active choline esterase inhibitor, acts for longer duration, has got few gastrointestinal side effects.

Indication:

1. Myasthenia gravis, paralytic illius and post-operative urinary retension, constipation and Parkinsonism.
    1. Tab mysitin (WHB).
    2. Tab distinon 60 mg (Samartha Pharma).
    3. Tab mestinon 60 mg (Chendra Bhyal).
    4. Tab exelon 50 to 60 mg (Novartis).

Myopathy

Progressive Muscular Dystrophy

A hereditary disorder where there is progressive degeneration of muscle or group of muscles without involvement of nervous system.

1. Pseudohypertrophic type.
2. Limb-girdle type.
3. Facio scapulohumoral type.

The affected arm larger and firmer than normal but weak gait is waddling. Patient cannot get up straight but turn on his face and then with the help of arms gets up, it is called climbing up on himself. Common in children. Same changes in limb-girdle and facioscapular muscles.

Electromyography (EMG) confirms the diagnosis and also muscle biopsy.

Treatment: It is only symptomatic and palliative physiotherapy and orthopedic. Surgical measures are required to correct the deformities.

Myotonic Dystrophy

The types we get are myotonia congenita and atrophica due to increased tone, patient cannot relax his grasp or open his eyes promptly. In atrophica type, there is wasting of facio and temporal muscles sternomastoid, shoulder forearms and quadriceps. The tongue is slow and ptosis is prominent. Cataract, testicular atrophy and impotence.

Treatment: Unsatisfactory symptomatically, tone is relieved by:

1. Procainamide 0.3 to 1 gm qid.
2. Quinine sulphate 300-600 mg tid.

Congenital Myopathies

They are present in infants. EMG is diagnostics. It may appear intermittently. Wasting is common.

Polymyositis

There are inflammatory cells in muscle fibers. It is progressive. Pain, weakness and wasting appears. Diagnosis by muscle biopsy.

Treatment: Response to corticosteroids is good. But, its association with carcinoma is to be kept in the mind and requires to be investigated for the primary site.

FEW IMPROTANT COMMON SIGNS AND SYMPTOMS IN NEUROLOGY

Ataxia (Failure of Muscle Coordination)

Varieties: Sensory, cerebellar, labyrinthine,

Cerebellar Ataxia: Tumor, abscess, thrombosis in cerebellum.

Sensory: Peripheral a neuritis, tabes, syphilitic patchy, meningitis, disseminated sclerosis spinal tumors, syringomyelia.

Labyrinthmatic ataxia: Meniere's disease, vertigo, acute Labyrinthitis arterial thrombosis hemorrhagic episodes.

Vertigo (A Disturbed Sensation in Relation to Body and the Space and Thereby Loosing Balance)

Ocular eye strain, refractory errors and oculomotor paralysis.

Objective in which patient feels objects moving around.

Nerves: Epilepsy, migraine, psychoneurosis.

Toxic: Alcohol, tobacco, opium, carbon monoxide, belladonna, quinine, salicylates.

Gastrointestinal: Gastritis, cholecystitis, hepatic diseases.

Neurological: Aneurysm or tumor at cerebello-pontine angle, thrombosis of cerebellar artery, tumor, abscess, cysts, encephalitis, syphilis and epilepsy.

Aural otitis media, Meniere's syndrome, foreign body in eustachian tube, wax in ear, rapid motion, swinging.

Circulatory auto stenosis and recognition, hyper or hypotension, cardiac arrhythmicus, sensitive carotid sinus.

Travel in ship, travel sickness, diabetes, menopause.

Hysterical associated with hysteria.

Phobias in acrophobia when there is fear for height.

Tingling and Numbness

It is found in peripheral neuritis, sub acute combined degeneration, tabes dorsalis, sciatica, transverse myelitis, disseminated sclerosis, intermittent, claudication, severe anemia, Raynaud's disease and valvular cardiac disease, frost bite.

WASTING (Diminishing of the Muscular Size Weakness and Loss of Weight)

Lack of nutrition: Sub-nutrition or malnutrition, vomiting stenotic lesions in GI tract, malabsorption, hepatic diseases, anorexia, dysphasia, achalasia achlorhydria, steatorrhea, spru, TB intestine, thyrotoxicosis, diabetes, nephritic syndrome and chronic nephritis, malignancy and psyclosis, depression, myxedema, chronic infection specially tuberculosis.

Vitamin Deficiencies Affecting Central Nervous System

Vit. A: Night blindness

Vit. B_1 (Thamine): Peripheral neuropathy Wernicke's and Korsakoff's syndrome.

B_2 Riboflavin and B_6 nicotine and Panthothemic Acid: Burning feet syndrome, peripheral neuropathy amblyopic.

B_{12}: Subacute combined degeneration.

Folic acid: Neuroencephillitis and anemia.

Vit. C: Ratinal and cerebral hemorrhages, purpura, scurvy.

Vit D: Osteogenic myopathy.

Vit. E: Peripheral and cerebellar neuropathy

Iodine: Cretinism and mental retardation.

Headache Ask the patient which part of head is more affected. If fronts, it is likely to be due to sinusitis corryza; if temporal, is due to hypertension and if occipital, it is due to refractory errors of eyes.

Migraine

If half of head, it is migraine which is accompanied by an aura of nausea. Photophobia and usually it is of the throbbing type, which remains for a few hours to a whole day. Chronic paroxysmal hemi- crania is called cluster headache is quite severe, recurrent and most common in males. It can usually be relieved by inhalation of 100 percent oxygen and

preventable by ergot preparations because it relieves the constriction of cranial vessels.

The drugs used in clinical practice are as follows:

A. *Tab. Ergotamine:* Should only be used when simple analgesics are ineffective. If given early in attack airing aura stage, it gives dramatic relief.

Dosage: 1 mg. every ½ an hour till complete relief.

Contraindications: Coronary artery disease, severe hypertension, impaired hepatic and renal function, septic conditions, pregnancy and lactation-in elderly use with caution.

(1) Tab Vasograin 1 mg + Paracetamol 250 mg + Caffine 2 mg (Zydus Cadila).

B. *Sumatriptan:* It relieves headache as well as other symptoms.

Dosage: 50 to 300 mg in one day; IV inj is available for emergency.

Contraindications: Coronary heart disease, hypertension, hepatic and renal impairment, pregnancy.

Side effects: Wheeziness, tightness in chest, swelling of eyelids, face and lips rash.

1. Tab Suminat 25, 50, 100 mg (Sun Pharma).
2. Inj sumitrex inj Kit, 0.5 ml. Can be given IV during severe attack for immediate relief.

C. *Flunarizine:*

Tab Flumarin 5, 10 mg (FDC).

Tab Nomigrain 5, 10 mg (Torrent).

Tab Sibelium 5, 10 mg (Jonson and Jonson).

Latest and reliable.

Dosage: 10 mg at night.

Contraindications: Pregnancy and lactation.

In children and elders, reduce the dose.

Side effects: Dryness of mouth, depression, drowsiness, gastric pain, insomnia.

- Headache associated with metabolic disorders. It is the result of hypoxia and common in chronic pulmonary diseases and in deep sleep apnea syndrome.
- Reflex head ache due to disorders of eye, teeth and paramedial sinuses, glaucoma, refractive errors. Heterophobia (cannot recognize colors), Squint, blurred vision (diplopia). Sometimes relief is obtained by closing the eyes)
- Cranial neuralgias are associated with headache.

Fundus, Optic Disk. and Papilledema

The funduscopy is the most essential part for diagnosis of diseases of central nervous system. The changes in the retinal vessels are to be seen for arteriovenus crossings, which are widened in malignant hypertension along with papilledema, cotton wool exudates and hemorrhages and star shaped figure of macula. Apart from hypertension, ratinal hemorrhages are not uncommon in anemia's, purpora, leukemia and diabetes and rarely in polycythemica vera and subacute bacterial endocarditis, and if thrombosis of central rational veins, the fundas and retina is red, macula is yellow, orange or cherry red. In case of aortic regurgitation, pulsating arteries are seen on fundus. There could be ratinitis pigmentosa when fundus is pale with cherry red macula. Tubercles can be made out giving help to diagnose military tuberculosis.

Detachment of retina is visible and is due to injury; severe infections and degenerative processed affecting the eyes.

Examination of choroid (The vascular coat between sclera and retina) shows us vascular condition of the eye, fundus tells us about papilledema and optic atrophy which maybe due to syphilis. General paralysis of insane, toxic substances such as tobacco, lead, arsenic or thrombosis of central retinal artery and glaucoma.

FUTURE PROSPECTUS IN NEUROLOGY

Exciting diagnostic armamentarium is available to localize the lesions, which are every helpful to diagnose the cases earlier and choose the appropriate treatment.

Progress of virology and immunology will reveal the etiological knowledge about so called deg-

enerative diseases and will guide us to treat as well as prevent the occurrence if possible through vaccines.

The genetic engineering when develops further will help us to prevent as well as modify the course congenital diseases to the best advantage of the patients.

The neurosurgery is doing miracle in giving complete or partial relief in oncological problems and has proved its indispensable role in therapy and this specialty is growing very fast. Some of these are even dreaming of brain implant the possibility heather to unknown.

On the whole, the outlook is bright in future with the help of medical and surgical therapies and with the help of improved diagnostic armamentarium.

PSYCHIATRY

Psychiatric Disorders

The arena of mental disease is only in the domain of the specialty of psychiatry, is the general misconception in all the medical and dental Practitioners, which is totally erroneous.

Body, brain and mind are inseparable unit and are inseparable parts of the total personality with whom you deal directly in professional practice.

Fortunately, we have got a machine EEG to estimate the "brain rhythm cycles" per second and thus the state of brain activity is classified as under:

1. 0 to 4 cycles per second is *delta* when one is unconscious.
2. 4 to 7 cycles in *theta* when the mind is inner conscious level associated with dreams.
3. 7 to 14 cycles per second is *alpha* when mind is inner conscious level associated in dreams.
4. 14 to 21 cycles per second is *beta* when one is conscious.

The brain vibrates when awake 7 to 14 cycles per second and it is in dreamy state either at day or night-time. The vibrations of brain are like pulsation of heart as both are vital signs of life. The brain is the computer and the mind (human intelligence or soul) is the programmer and programs are manifested in action and conduct.

Mental disorders and insanity are really the abnormality of conduct shown by the failure of the individual to adjust himself to the social environment around giving no evidence to others about mental deficiency and decay.

After the advent of lunacy act, the legal bonds over hospitalization in lunatic asylums and certification, etc. has got restricting and damaging aspects to the financial side of the labeled patient the matter has become socially important and the treatment of these patients no longer remained only on a humanitarian basis but got improved into additional responsibilities and formalities for the psychiatrists.

The specialty is gaining popularity due to increasing need of it in children for IQ estimation and in professional guidance, in industry for estimating aptitude and suitability even in case of marriage, when they are consulted by both the sides for suitability.

As regards, general practitioners they should not think that treatment of common disorders such as depression, confusion, stress and strain causing psychoneurosis etc. has nothing to do with them but should always spot out their coexistence with organic diseases and when required treat them even with the help of specialist.

Classification of Psychiatric Disorders

(A) Minor disorders	*(B) Major disorders*
1. Psychoneurosis	1. Acute delirium
2. Personality disorders	2. Dementia
3. Psychosomatic disorders	3. Schizophrenia
4. Sexual deviation	4. Maniac depressive psychosis
5. Addictions	5. Mania
6. Alcoholism	
7. Mental retardation	

We are concerned with minor disorders leaving the major for psychiatrists.

Minor Disorders

Practioners after taking complete history should examine the patient clinically and come to the probable diagnosis and alternate possibilities to be recorded on paper.

Thereafter, he should think whether his patient falls into the following categories:

1. Anxiety neurosis.
2. Hysterical neurosis.
3. Obsessions neurosis.
4. Phobic neurosis.
5. Depressive neurosis.
6. Hypochondria.

For confirmation of his suspicion, the practioner should ask more and more confirmatory questions related to his childhood when he was submitted with fevers, psychic trauma, punishments, accidents, marriage, occupation, court cases, tax problems or has got some phobias or habits of drugs, masturbation, property matters cheating by friends or relation, about health care regulation and apprehensions, etc.

The usual obsessive fears or phobias are as follows:

1. Agoraphobia (fear of open space).
2. Acrophobia (fear of heights).
3. Aichmophobia (fear of sharp objects).
4. Claustrophobia (fear of closed spaces).
5. Coprophobia (fear of contamination by excreta).
6. Monophobia (fear of solitude).
7. Mysophobia (fear of dirt).
8. Nyctophobia (fear of darkness).
9. Pathophobia (fear of infection).

All these can be excluded by enquiring the patient in confidence.

Personality Changes

Practioners should talk to relations, wife, mother and father and his friends and employer even by phones to see if his behavior is changed. If they have noticed, please make a note of it. Ask whether the patient has got hobbies, games, likings and dislikings, whether he is timid or aggressive, popular or isolated about his school progress book if available should be seen. His successes and failures; apprehension and ambitious to be recorded but only the positive findings.

Psychosomatic Disorders

The medical diseases such as asthma, epilepsy, ulcerative colitis and diarrhea, peptic ulcer, neurodermatitis are related emotional state of patients.

Sexual Deviation

If patient is adolescent or adult, enquired in special confidentiality. Specifically about masturbation and illicit sexual contacts.

Addictions

Drugs, tobacco, alcohol, opium, even tea and coffee should be specifically enquired.

Mental Retardation

It is easily diagnosed by talking to the patient and by letting him count the number and recall the important dates and some important persons and places.

Thus the psychological history is an additional exercise for the practioner so that he can add psychological medicines along with the treatment or organic diseases.

About major psychic disorders it is always safe to refer the patient to psychiatrist.

Drug for Psychiatric Patients

Drugs commonly used in minor psychiatric patients are:

1. Sedatives and tranquillizers.
2. Anti depressants.
3. Hypnotics.

Sedatives and Tranquillizers

Diazepam

Indication: Anxiety, tension, muscle spasm, dysmenorrhea, labor, tetanus and eclampsia, spastisity.

Contraindications: Glaucoma, myasthenia gravis, pregnancy.
Dose: 5 to 30 mg/1 day in divided doses. When injection is indicated, it should to be given very slowly.
Side effects: Sleepiness, drowsiness, vertigo, increased appetite and weight gain.
Drugs used in practice are as follow:

1. Tab diazepam Suspension, inj tab 5 to 10 mg, susp 2 mg 1 TSF, inj 10 mg IM or IV (Ranbaxy).
2. Tab elcion 10 mg (Ranbaxy).
3. Tab placidox-2.2 mg tab, 5 mg tab (Lupin).
4. Tab, valium 2.5 to 10 mg (Nicholas).

Alprazolam

It is anti-anxiety drug. May give rise to more sleep.
Indication: Anxiety associated with depression for short-term relief of symptoms.
Contraindications: Glaucoma, pregnancy, in children.
Dosage: 0.25 to 0.5 mg tid maximum 3 to 4 mg tid for elderly lower the dose.
Side effects: Drowsiness, light headache, anorexia, transient amenesia, loss of coordination, slurring speech, feeling of weakness and pruritus and depression.

Preparations used in practice:

1. Tab Alpraquil 0.5 to 0.25 mg (Lupin)
2. Tab Alprax 0.5 to 0.1 mg (Torrent)
3. Tab Alprocontin 0.5, 1 mg to 1.5 mg (Modi Mundi).
4. Alzolam 0.5, 0.25 mg (Sun Pharma).
5. Tab Anzilum 0.25-05-1 mg and SR 0.5, 1 and 1.5 mg (Protac).
6. Tab. Restyl 0.25, 0.5, 1 mg and SR 0.5, 1, 1.5 mg.
7. Tab Trika 0.125, 0.25, 0.5, and 1 mg (Neu Foreva).
8. Tab Trika SR 0.5 mg +1 to 1.5 mg (Neu Foreva).
9. Tab Zoldac 0.25, 0.5 and 1 mg (Zydus Medica).

Other combinations are quite potent and useful:

1. Tab Alprax Forte (Ayrazolam 0.5 + Sestaline 50 mg) (Torrent).
2. Tab Alzovan (Alprazolam 0.25 + Propranolol 10 mg) (Ranip Drugs)
3. Tab Finezo 1 mg (Alprazolam 0.25 + Imipramine 25 mg) (Fine Care Pharma).
4. Tab Trika Plus (Alprazolam + Sertaline 25 mg) (Neu Foreva)
5. Tab Trika Plus Forte (Alprazolam + Sertaline 50 mg) (Neu Foreva).

Zolpidem

Indications: Short-term treatment of insomnia.
Contraindications: Myasthema gravis, hepatis and pulmonary deficiency; no other work except sleep after administration.
Preparations used in practice are as follows:

1. Tab Nitrest 10 mg before going to bed at night (Sun Pharma) before dinner.
2. Tab Zoldem 5 to 10 mg before going to bed at night (Anglo-French) before dinner.

Chlordiazepoxide

Produces slow, smooth long lasting effect.
Indications: Anxiety, tension, insomnia, emotional disturbances.
Contraindications: Glaucoma, pregnancy, lactation, alcoholics, hepatic and renal impairments.
Dosage: 10 mg qid reduce the dose in elderly

1. Cap librium tabs 10 to 25 mg (Nicholas)

Oxazepam

Prompt action
Indications: Anxiety, tension, agitation, irritability or anxiety with alcohol withdrawal; to be avoided in children.
Dosage: 10 to 15 mg 3, 4 times a day in severe cases 15 to 30 mg.
Contraindication: Glaucoma.
Side effects: Headache, drowsiness, vertigo, hypertension, blurred vision, fever, skin rashes, drug dependence.
Preparations used in practice are as follows:

1. Tab ativan 1 to 2 mg (Wyeth Lederle).
2. Tab calmese 1 to 2 mg (Themas Chemicals) inj calmese 2 mg inj 2 ml IM.
3. Tab larpose 1 mg, 2 mg (Cipla).
4. Trapex 1 mg 2 mg (Sun Pharma).

Quinidine Phenyl Ethyl Barbiturate

It is an analgesic that effects on central nervous system and muscles and heart.

Indications: Anxiety, insomnia, restlessness, apprehension, muscular cramps, palpations, extra systoles.

Contraindications: Heart block

Side effects: Postural hypertension.

The preparation used in practice is as below:

1. Tab Nateardine (Quinidine phenyl barbiturate 100 mg) (Franco India)

Melatonin

It is a hormon produced in pineal gland. It postpones aging and boosts up immune function.

Indication: Management of disturbed biorhythms

Dosage: 1.5 mg one tab at bed times.

Preparations used in practice are as follows.

1. Tab Bioclock (Alprazolam 8.25 + Melatonics 3 mg) (Valiant Health Care).
2. Tab Meloset (Melatonic 3 mg) (Aristo).
3. Tab Zytonin (Melatonic 3 mg + B6 10 mg) (Indus H).

Natural Herbal Tranquilizers (Neuromine)

Indications: Cardiac neurosis, palpitation, tachycardia, pseudoangina, psychosomatic disorders mild sedation.

Dosage: 1-2 tab tid.

Contraindication: Glaucoma, myasthemia gravis

Preparation used in practice is as below:

1. Nevromine tab/cap (Franco India)
   Contains Ashwagandha 500 mg + Jata Mansi 350 ml).

Antidepressants

Imipramine

Indication: Anxiety, depression, nocturnal enuresis, narcolepsy (uncontrollable desire to sleep).

Contraindication: Heart block, glaucoma, renal hepatic disorders.

Dose: 25-50 mg tid, gradually increase every week for nocturnal enuresis 12 to 50 mg at bed times.

Special precaution: Postural hypotension, epilepsy, hypertension, hyperthyroidism.

Side effects: Dry mouth, tachycardia, insomnia, tremors, dizziness, sweating, fatigue, ataxia, and impotence.

Preparations used in practice are as follows:

1. Tab Imipramine 25 mg, cap Impramine 75 mg (Sun Pharma).
2. Tab Prazep (Imipramine ltd. 25 mg + diazepam 5 mg) (Sun Pharma)
   Tab Prazep-2 (Imipramine ltd 25 mg + diazepam 10 mg) (Sun Pharma).
3. Tancodep (Imipramine ltd 25 mg + diazepam 5 mg) (Torrent)
   Tancodep (Impramine Ltd 25 mg + diazepam 5 mg) (Torrent).

Amoxapine (Not to be used in children)

Indication: Endogenous depression, obsessive neurosis, phobic states.

Contraindication: Cardiac, renal and hepatic insufficiencies.

Dosage: Initially 100 to 150 mg/day increase maximum 300 mg/day.

Preparation used in practice is as follow:

Tab Demolax 50 to 100 mg (Wyeth Lederle)

Mirtazapine (Not to be used in children)

Indication: Depression

Dosage: 15 mg/day as single dose before going to bed at night before dinner.

Preparations used in practice are as below:

1. Tab Mirt 15, 30 and 45 mg (Panacia Biotec)
2. Tab Mirtaz 15, 30, 45 mg (Sun Pharma)

Nortriptyline

Indications: *Maniac depression psychosis, neurotic masked depression.*

Contraindications: Glaucoma, high BP, cardiac infarction.
Dosage: 50 to 150 mg/day
Side effects: Sedation, confusion, dry mouth, constipation, jaundice, rash, tremors, cardiac arrhythmias, altered vision.
Preparations used in practice are as follows:
1. Primox tablet 25 mg (Sun Pharma).
2. Sensival tablet 25 mg (Wallace).

Nitrooxazepine
Indications: Depression, nocturnal enuresis
Dosage: 25 to 50 mg tid.
Preparation used in practice is as below:
1. Tab Sintamil 25 and 75 mg (Novartis)

Amitriptyline
Suitable for patients of depression with anxiety and agitation and restlessness, alcoholics and bed wetting.
Dose: 10 to 25 mg/day tid maximum 150 to 225 mg.
Preparations used in practice:
1. Tab Amline 10, 25 and 50 mg (Torrent)
2. Tab Amitrol 12.5 mg and 25 mg (Torrent)

Fluoxetine Hydrochloride
Potent anti-depressed, non sedatives.
Indications: All types of depressions where no relation is required.

Dosage: 20 mg od in the morning can be increased up to 80 mg.
Preparations used in practice:
1. Cap Dawnex 20 mg (Micro Lab).
2. Cap Fludac 10, 20 and 60 mg (Zydus Cadila).
3. Tab Flunat 10 to 20 mg (Sun Pharma).
4. Cap Oxedep 20 mg) (Torrent).
5. Cap Prodep 20 mg, Suspension 20 mg/TSF (Sun Pharma).

Other Combinations
1. Tab Altin (Fluoxetine 20 mg + Alprazolam 0.25) (Zee Lab).
2. Tab Cool plus Fluoxetine 20 mg + Alprazolam 0.25) (Shinto Organics).

Clomipramine
It is a mood elevator, potent antidepressant
Indication: Endogenous, depression, obsessive neurosis, phobic status.
Dose: 100 to 150 mg daily either divided or as single dose.
Contraindications: Epilepsy, cardiac problems, glaucoma.
Side effects: Hypotension, jaundice, rashes, tremors, convulsions, sedations, drowsiness, constipation, dry mouth.
Preparations used in practice are as follows:
1. Tab Anafranil 25 mg (Novartis).
2. Tab Clofranil 10, 25 and 50 mg (Sun Pharma).
3. Tab Clofranil SR 75 mg. (Sun Pharma).
4. Tab Clomifril 10, 25 and 50 mg (Torrent).
5. Tab Clonil 10, 25 and 50 mg (Intas).

Doxepin
Quicker action; preferred in elderly. Less cardiac complications and anti-chlormingic side effects.
Indications: Psychotic depression, anxiety.
Contraindications: Not to be used in children, epilepsy, enlarged prostrate, hepatic problems.
Side effects: Impaired alertness, tremors, hypo tension, fatigue, ataxia, convulsions, jaundice, impotence.
Preparations used in practice:
1. Cap Doxetar 10 to 20 mg.
   Cap Doxetar Forte 75 mg (Torrent).
2. Tab Spectra 10, 25, and 75 mg (Solus).

Mianserin
Indication: Psychotic depression, phobic states.
Dose: 30 to 60 mg in divided or single dose at bed times at night.
Contraindications: Pregnancy, lactation, hepatic and cardiac impairment, mania.
Side effects: Drowsiness, jaundice, fits, rashes.

Preparations used in practice:
1. Tab Depnon 10, 30 mg (Infar).
2. Tab Tetradep 10, 20 and 30 mg (Torrent).

Trazodone

Preferred for elderly; less potent but weak anticholinergic action and cardiac arrhythmias. Can be used in glaucomatous patients, penile erection is prolonged and painful. And can be used for anxiety.
Indication: Depression with anxiety and insomnia, chronic alcoholism and phobic state (not to be used in pregnancy and lactation).
Side effects: Headache, dizziness and drowsiness.
Dose: 50 to 200 mg, at bed time in night.
Preparations used in practice:
Tab Tazodac 25 and 50 mg (Abidac)
Tab Trazalon 25 and 50 mg (Sun Pharma)
Tab Trazonil 25, 50 mg and 100 mg (Intas)

Penfluridol

Indications: Chronic schizophrenia, paranoid symptoms, social mal adjustments.
Contraindication: Hepatic impairment, pregnancy, lactation
Side effects: Blood dyscrasias, dry mouth, blurring vision, weight gain, rashes, jaundice, hypotension, cataract ?
Dose: 20 to 60 mg, weekly maximum 120 mg.
Preparations used in practice:
Tab Flumap 20 mg (Torrent)
Tab Semap 20 mg (Johnson and Johnson)

Flupentixol

Used in thought disorders such as hallucinations and delusions. Suitable for long-term use. No sedative action
Indication: Schizophrenia, to be avoided in pregnancy and lactation.
Dose: 20 to 40 mg inj IM in 1 to 2 ml every 2 to 4 weeks orally 0.5 bid; increase upto 0.5 to 3 mg daily. Maximum 40 ml (Maintenance 3 to 12 mg)
Preparations used in practice:
Tab Fluanxol 0.5, 1 mg, 3 mg (CFL)
Tab Fluanxol Depol inj 20 mg/ml 40 mg/2 ml (CFL).

Hypnotics

Barbiturates

Generalized depression, anticonvalescent.
Indications: Mania, epilepsy, insomnia
Dosage: sedative 15 to 30 mg/day hypnotic 60 to 120 mg/day.
Side effects: Hang over, confusion, rashes, swelling of eyelids.

Preparations used in practice:
1. Tab Gardenal 30, 60 mg (Nicholas)
   syrup Gardenal 30, 60 mg/TSF
   inj IM Gardenal 200 mg/ml.
2. Tab Luminal 30 mg (Bayer).

Nitrazepam

Acts on midbrain, muscle relaxant, good for frequent night time awakening.
Indications: Insomnia, pre-anesthetic administration.
Side effects: Dry mouth, urinary incontinence, nightmares, withdrawal syndrome, weakness, blurring vision.
Dosage: 5 to 10 mg before going to bed at night.

Preparations used in practice
1. Tab Hyprex 10 mg (VIP Pharma).
2. Tab Nite 5 mg, 10 mg (Stadmed).
3. Tab Nitrosun 5 mg, 10 mg (Sun Pharma).
4. Tab Nitzy 10 mg (Zee Lab).

Zopiclone

Rapidly initiates sleep.
Indications: Insomnia
Contraindications: Chronic respiratory diseases, myasthenia, gravis.
Dosage: 7.5 to 15 mg before going to bed at night.

Preparations used in practice:
1. Tab Somna 7.5 mg (Brown and Burk).
2. Tab Ziclone 7.5 mg (Bal. Pharma).
3. Tab Zolium 7.5 mg (FDC).
4. Zolog 7.5 mg (Shreya Health Care).

MENTAL DEFICIENCY (AMENTIA OR OLIGOPHRENIA)

It maybe due to:

1. Neuropathic heredity.
2. Consanguinity.
3. Age disparity in the couple (parents).
4. Alcoholism.
5. Chronic infection of syphilis.
6. Birth injuries and delayed deliveries causing asphyxia.
7. Malnutrition and vitamin deficiencies.
8. Infections of brain encephalitis.

Assessment of Amentia

Three degrees of intellectual defects are recognized by Mental Defeciency Act of 1913, UK.

1. *Idiots*: IQ below 30 deeply mental objective unable to guard themselves from common damages such as fire.
2. *Imbesiles*: IQ between 30 to 50 ; they are unable to manage themselves and even to learn.
3. *Feeble-mindedness:* IQ 50 to 70 they require care, supervision and control. They are educationally sub, normal and indecisive and morally defective. They may do minor jobs after learning, of course with difficulty.

Stigmas and Associated Anomalies in the Mentally Defective Persons

1. Circumference of head is smaller at least 2½″ less than normal. The top can be abnormally flat (Platy cephalus) or doom shaped (oxy-cephalous)
2. Projecting chin (Prognathism) or under developed chin.
3. Teeth maybe irregularly placed or unduly prominent.
4. Ears variation in size, situation, subsequent or adherent lobula, deafness.
5. Palates maybe high; horseshoe-shaped, low broad, cleft palate with hare lip.
6. Tongue large and fissured as seen in Mongols.
7. Eyes: Coloboma, retinitis pigmentosa, epicanthic fold, high degree of refractory errors.
8. Limbs: May be asymmetrical, webbed, supernumery toes or fingers.
9. Skin: Course, greasy with numerous moles and nevi, adenoma sebaceum.
10. Hair: Abnormal quantity, distribution and texture.
11. Visceral: Pulmonary stenosis, auricular and ventricular abnormalities.
12. Sensory defects: Perception is impaired, imagination aspects limited.
13. Memory: Poor.
14. Power of Judgment impaired.
15. Sentiments under developed.
16. They are apathetic, mild, inoffensive or reverse, excitable, violent, aggressive and destructive.
17. Automatic activity of nodding, rocking, thumb sucking.

Hematology 11

BLOOD AND ITS CONSTITUENTS

Blood is the life fluid of the body. It contains RBC, WBC, and platelet plasma serum. It provides oxygen to all the cells of the body taken through the lungs and exits CO_2 out through the lungs. It provides nourishment to all the cells of body through plasma which contains carbohydrates in the shape of glucose, proteins in the shape of amino acids and fats in the shape of cholesterol and also the vitamins and minerals all absorbed from intestine and processed by the liver. With the help of platelets or thrombocytes. It plays an important role to plug the leakages causing bleeding and serum containing antibodies plays the role of defense along with WBC.

In a mobile living creature to maintain blood supply to the antigravity structures of the body, it has to be pumped which is done by left ventricle of the heart ceaselessly and constantly from birth to death and gets back the deoxygenated RBC and metabolites through the veins approaching the right ventricle to the lung. Again while the unwanted metabolites are thrown out by kidneys and CO_2 by lungs. The process is automatically governed by involuntary sympathetic nervous system. The required variations in circulation is governed by midbrain after getting indications from cerebral cortex.

In order to appreciate the roll of constituents of blood, we will discuss them one by one.

- RBC is short form of red blood corpuscles technically called erythrocytes. The red color is due to iron, which is in combination of globulin type of protein called hemoglobin. The role of erythrocytes depends on their content of hemoglobin, which is formed in the bone marrow. Its function is to transport oxygen and provide it to all the cells of the body as well as buffer carbonic acid to be expelled through lungs in the shape of CO_2.
- Erythrocytes are originated from stem cells in bone morrow and pass through nuclear stages to be matured as non-nucleated erythrocyte Vit. B_{12} and folic acid, which are necessary for nucleic acid synthesis. Iron is essential for synthesis of hemoglobin. Total iron content of human body is 5 gm 60 percent is in erythrocytes and the remaining is stored in liver, spleen and bone morrow in the form of ferritin or hemosiderin. The survival time of erythrocytes is about 120 days (4 months). Thus, they are destroyed by the reticuloend-

othelial systems and then iron is mostly re-utilized for fresh hemoglobin synthesis but the iron free residual pigment biliverdin is converted into bilirubin and carried by plasma to liver for excretion in the bile.

- In various pathological conditions, the shape of erythrocytes alter such as below:
  1. Anisocytosis (Irregular shape).
  2. Elliptocytosis (Shape is elliptical).
  3. Poikilocytosis (Mal formed).
  4. Polychromasia (abnormal color after staining)
  5. Reticulocytosis (Nuclear erythrocytes).
- Terms used to indicate the blood disorders:

1. Anemia (When hemoglobin is erythrocyte is less or blood quantity is less).
2. Microcytosis (The average diameter of erythrocyte is less).
3. Macrocytosis (The average diameter of erythrocytosis is more).
4. Hypochromic (When only hemoglobin in the erythrocyte is less).

Disorders of Red Blood Cells

A. The anemia.
B. Polycythemia vera.

Classification

1. Dyshemopoietic (Insufficient blood formation such as deficient diet in iron, folic acid and B_{12}; (Bone marrow unable to utilize hematinics, other blood disorders such as leukemias, and malignancies such as lymphadenomas, or aplastic primary or drug induced such as choramphenicol.
2. Hemolytic where intravascular blood destruction is more such as malaria, sickle cell anemia, mismatched blood transfusion or hereditary type G6PD deficiency congenital hemolytic anemia.
3. Hemorrhagic type (due to blood loss).
   Accidents, operation, purpuras, leukemias, hemorrhagic disorders such as hemophilia, infection drugs; hypersplenism.

ANEMIA

General Clinical Features of Anemias

Weakness, fatigue, lassitude, breathlessness on disproportionate exercision, dizziness, visual disturbance, pallar, palpitation, tachycardia, systolic murmurs, anorexia, dyspepsia, tingling and numbness. In severe cases, there is edema on the dependant parts, angina, insomnia, apathy and depression

1. Diagnosis

History is most important.

- *Family history:* is positive as, e.g. pernicious anemia in males and chronic hypochromic anemia in females.
- *Occupation:* Lead industry,
- *Drugs:* Sulphonamides.
- *X-ray exposure:* Such as deep ray therapy.
- *Racial history:* Racial origin and community is important. Thalassemia: Common in sindhis, cutohis, bhanushali and loharas. Sickle cell anemia: It is also common in tribes.
  G6PD: Deficiency is common in parsis.
- *Dietary history:*
- *Bleeding tendency:* Piles, menorrhagia, post-operative, hookworm, tape worm, bilharziasis
- *Infection:* Malaria, chronic bronchiactasis, sub-acute bacterial endocarditis, septecemia,
- *Dysphagia:* In chronic microcytic anemia and achlorhydria
- Pregnancy and delivery
- *History of diarrhea:* Sprue, celiac disease and malabsorption syndrome, ulcerative colitis
- Hematuria, hemoptysis and hematemesis.

2. *Physical Examination*

- *Inspection:* Pallar, brittle and concave nails (koilonychia), glossitis and atrophy of the papillae of the tongue.

- *Palpation:* Splenomegaly in malaria, see presence of edema. Hepatomegaly in kala azar. Enlarged lymph nodes in Hodgkin's, lymphatic leukemia and TB, presence of jaundice, fever as in hemolytic anemia. Tenderness on bones in leukemia, presence of ulcers
- *Auscultation:* Systolic murmur may be present.

And look for evidence of malignancy, infarctions

Laboratory tests and X-rays

i. Complete blood picture.
ii. ESR.
iii. Bone marrow biopsy.
iv. Coaugulation and bleeding time. Platelet count.
v. Erythrocyte fragility.
vi. Icteric index.
vii. Urine exam for bile salts and bile pigments.
viii. Stool exam for protozoa, worms ova and cysts.
ix. Gastric analysis.
x. X-ray skull to exclude "Hair on end" appears in sickle cell anemia and Cooley's anemia.
xi. Barium meals to exclude peptic ulcer, hiatus hernia and ulcerative colitis.
xii. X-ray chest to exclude pulmonary TB of the lung, lung abscess, malignancies, bronchiectasis.
xiii. VDRL; HIV.
xiv. Sputum exam for TB.
xv. Mantoux skin test.

IRON DEFICIENCY ANEMIA

(Chronic nutritional or hypochronic anemia)

It is the commonest type all over the world. More common in ladies as they loose blood in periods, pregnancy and delivery and replacement of iron falls short due to increased demand.

Clinical Picture

There will be fatigability. On set is gradual. All other symptoms are already discussed above including koilonychias, angular stomatitis and atrophy of mucous membrane of the pharynx. Sometimes causing dysphasia called "Plummer-Vinson" syndrome. It leads to loss of energy and lower the resistance for infection and vertigo.

Diagnosis

By blood eximination.

Treatment

Daily requirement of iron is 1 mg to 1.5 mg market is flooded with iron preparations.

Few preparations used in practice are as below:

1. Cap Anemidox 1 od (Merk).
2. Syrup Atrovit LTSF TIO (Alo Pharma).
3. Cap Atrovit 1 od (Alo Pharma).
4. Cap. Autrin 1 od (Wyeth Lederle).
5. Chewable tab Camy 1 bid (Moracare Lab).
6. Suspension Camy 1 TSF bd (Moracare Lab).
7. Drops for infents Camy 8-10 drops bd (Moracare Lab).
8. Cap, Charisma 1 bid (Charisma Health Care).
9. Tab Cherish 1 bid (Wander).
10. Syrup Dexorange 1 TS tid (Franco Indian).
11. Cap Dexorange 1 bid (Franco Indian).
12. Pediatric syrup Dexorange (Franco Indian).
13. Tab (chewable) and syrup (Ferglow Biochem).
14. Liquid and cap Ferrochelate (Albert David).
15. Cap Ferrochelate—Z 100 (Albert David).
16. Tab Ferrolate—CM (Glaxo Smith Kline).
17. Cap Ferygold (Bestochem).
18. Cap Fetrace (Wackhardt).
19. Cap Globac (Zydus Cadila).
20. Syrup Haemgrow (Fem Care Pharma).
21. Tab Haemgrow (Fem Care Pharma).
22. Cap Hemfast (Fem Care Pharma).
23. Cap Hemsyneral—td (USV).
24. Cap Plastules B_{12} (Wyeth).
25. Syrup Profeton (Mercury).
26. Cap Probofex (Wockhardt).
27. Cap Hemy (Briocin Health Care).
28. Liquid Livogen (Allenburys).

Injectable iron preparations:

1. Inj Imferon 2 ml inj IM (Shreya).
2. Inj Imferon B_{12} 2 ml inj IM (Shreya).
3. Inj Imferon with folic acid F-12 2 ml inj IM (Shreya).
4. Inj Jectofer 1.5 ml inj IM (CFL Pharma)
5. Inj Jectofer plus with B_{12} 1.5 ml inj IM (CFL Pharma).

Hemolytic Anemias

Abnormal hemolysis intravascular is a serious problem, for convenience of clear understanding. It is divided into:

1. Hereditary 2. Acquired.

1. Hereditary: Under this category spherocytosis G6PD deficiency and other hemoglobinopathies such as sickle-cell disease, Thalassemia.

The RBC being abnormal and more fragile are destroyed easily causing intravascular hemolysis and anemia. The symptoms are seen in childhood without any serious complaint in the beginning. There is pallor and moderate yellow tint. When crises occur at variable interval there is jaundice and severe anemia. Spleen is enlarged associated with fever rigors and vomiting. Usually infection is precipitating factor of crisis. Diagnosis is established when there is increased fragibility of RBC is found along with microsperocytosis and splenomegaly. Coombs' test is negative. These patients develop cholecystitis and pigment stones in gallbladder (cholelithiasis) and complications thereby.

Treatment: Splenectomy gives permanent improvement for both symptoms and anemia. If anemia is severe, careful blood transfusion is necessary. Iron and other hematinics are of no value neither corticosteroids are indicated.

Acquired Hemolytic Anemias

It is due to infection such as malaria, gas gangrene etc.

Other drugs such as arsenic, lead, sulphonamides methyldopa, etc. can precipitate hemolysis.

Posthemorrhagic Anemia

Rapid loss of more than one-liter blood precipitates shock and it is usually fatal. Slow bleeding gives time to counteract the loss by compensatory mechanism. Repeated blood loss usually occurs due to peptic ulcers, menorrhagia, bleeding piles, carcinomas; accidents and injuries, postoperative and deliveries.

All the causes mentioned above are treatable but require careful management, blood transfusions and surgery as well as hematinics, hospitalization and proper nursing.

Transfusion of incompatible blood is a serious complication. Incompatibility maybe in careless typing of blood group, sub-groups or Rh factors. It is essential to cross match with the donor's blood before transfusion. The symptoms appear immediately after few ml. Blood is entered in the recipient's body, the transfusion should be stopped.

HEMORRHAGIC DISORDERS

1. Vascular factor.
2. Thrombocytic.
3. Factors responsible for coagulation of blood.

1. *Vascular Factor*

Capillaries contract when there is injury, to initiate the natural homeostasis. If there is defect in capillary endothelium, it is called purpuras, which can be due to infection such as typhoid, typhus, septicemia, measles, etc. or chemicals such as aspirine, indomethacin, quinine, snake venom or anaphylaxis such as "Henoch-Schönlein" purpura.

Platelets deficiency Such as idiopathic thrombocytopenic purpura or symptomatic thrombocytopenic purpura. Defect in clotting mechanism: Such as hemophilia, Christmas disease, hypoprothrombinemia or congenital and acquired fibrinogenopenia.

Purpura is not a disease but a manifestation of underlying disease and it only means that there is

bleeding under skin or mucous membrane. Tiny skin head spots are called petechiae. They do not disappear on pressure. Large purpuric hemorrhages are called ecchymoses, which may indicate coagulation defects also.

Investigations Coagulation time and bleeding time, platelet count, prothrombin time and specialized laboratory tests to know quantitative reading for fibrinogen deficiency and also partial thromboplastene time and coagulation defects.

There could be hereditary manifestation such as collection of non-contractile capillaries inside nose causing Epistaxis or else where on hands, mouth, mucous membrane when bleeding they are difficult to treat except cauterization.

2. *Thrombocytic Factors*

Idiopathic Thrombocytopenic Purpura

This is a disease of unknown origin, where there is quantitative deficiency of platelets. This is common in children and young adults. Its occurrence after viral infection is seen.

Purpura and bleeding occurs from any site, epitasis, hemoptysis, melena, and hamaturia normal platelet count is 2,50,000 but when falls below 40,000 the bleeding is severe. Bleeding time is prolonged for 15 to 20 minutes and capillary resistance test is strongly positive. The coagulation time is normal but the clot is soft and friable.

Treatment

Blood transfusions repeatedly requires to be given to stop the bleeding and save the life. The interim effective help from administration of corticosteroid. Splenctomy must be done and it is the only answer to the problem. Secondary thrombocytopenia may occur in cases of pancytopenia, leukemia, hypersplenism, multiple neoplastic metastatic lesions in bone marrow or complication of X-rays or radioactive isotope overdose or in systemic lupus erythematosis or due to drugs such as frusemide, indomethacin, sulphonamides tolbutamide, etc. These drugs are withdrawn immediately.

3. *Coagulative Factors*

When there is defect in the clotting mechanism such as hemophilia (factor VIII, AHF, AHG). It is hereditary disorder and there is tendency of excessive bleeding as coagulation time is prolonged. Family history is usually positive.

Clinical features: Tendency appears in early childhood such as epistaxis which is the commonest manifestation but bleeding can take place from mouth and GI tract, melena, hematuria, hematemesis, in joints leading to ankylosis, deformities, and disability. Progressive anemia is usually present.

Treatment: Fresh blood transfusion is always required to combat the situation. Rusell's viper venom, adrenalin pack in the nose, local ice bags, aspiration of the blood from swollen joints is required in addition to transfusion of fresh blood.

When factor IX is deficient it is called Christmas disease. Thromboplastin generation test can diagnose this. This condition is more severe than hemophilia.

Treatment: Same as mentioned above in the treatment of hemophilia.

Polycythemia vera

Etiology: Unknown

Common in both the sexes mostly seen in middle age. There is overproduction of RBC in hyperplastic bone marrow. On set is slow, there is a throbbing headache, dizziness, tinitus, weakness and loss of appetite. There is usually hypertension and possibility of thrombosis anywhere either coronary or cerebral. Face looks reddish and usually spleen is palpable.

Blood shows HB 16-20 G/d and raised RBC count.

Treatment

1. Venesetion: About 500 cc of blood is withdrawn once or twice a week.

2. Irradiation of long bones by deep ray or by radioactive phosphorus P32 by single dose given IV injection.
3. Chemotherapy: Busulphur 2 to 4 mg/day followed by maintenance dose of 2 mg once or twice a week.

With careful treatment the life span maybe normal except when not complicated with thrombotic episodes.

ANEMIAS DUE TO DEFICIENCY OF B_{12} FOLIC ACID CALLED MEGALOBLASTIC ANEMIAS

ETIOLOGY

1. Deficient intake of B_{12} and folic acid in diet.
2. Failure of absorption of B_{12} and folic acid due to resection of stomach (Total or partial gastrectomy).
3. The absence of intrinsic factor the B_{12} and folic acid is not assimilated as in addisonian pernicious anemia.
4. Where Institutional bacterias utilize B_{12} and folic acid rendering its unavailability to the host.
5. Pregnancy megaloblastic anemia responds to folic acid but refractory to B_{12}.
6. Infection of tapeworm Diphyllobothrium latum leads to megaloblastic anemia because the worm absorbs B_{12} from the intestine of the host by its whole body.
7. Drug administration which are folate antagonists such as methotrexate and pyrimenthamins used in the treatment of leukemia.
8. Increased demand of folate in leukemia and hemolytic anemia by bone marrow to produce excessive cells causes relative deficiency.

ADDISONIAN PERNICIOUS ANEMIA

Megaloblastic anemia is due to failure of secretion of intrinsic factor by the stomach.

Disease seen after the age of 30, more common in female and the condition is often familial. Gastric mucosa is thin and atrophic and in untreated cases there is degenerative changes in the posterior and lateral tracts of spinal cord.

Clinical features: Onset is slow. All symptoms as discussed before under the heading "Anemia" are present. There maybe soreness of tongue, diarrhea pallor present and skin may look lemon-yellow. Surface of the tongue look smooth and atrophic sometimes it is red and inflamed. Gastric analysis shows achlorhydria and urine shows urobilinogen. The rigors and symptom of posterier columns degeneration will be seen in advanced cases starting with paresthesia, tingling and numbness in the hands and feet and sensory ataxia. Position and vibration sense is impaired. Ankle jerk is lost. Primary optic atrophy and mental impairment is seen.

Investigation: 1. CBC, 2. Bone marrow biopsy, 3. Serum B_{12} is low.

Treatment: B_{12} inj IM 1000 mg od for 10 days or more depending on response; B_{12} tab by mouth for long-time for rest of life.

BLOOD TRANSFUSION

Transfusion of blood is one of the most invaluable life saving therapeutic measure in the hands of a doctor to treat the condition of shock after acute blood loss which maybe due to accident, injury, surgery and hemolytic crisis, provided it is safe and free from hazards.

Hazards of Blood Transfusion

1. Febrile reaction maybe due to pyrogen in apparatus.
2. Allergic reaction maybe mild but when severe maybe treated with anti-histamines and corticosteroids, slow the speed of transfusion.
3. Circulatory over load, pulmonary conjestion cripitations at the base of the lungs or even stop the transfusion temporarily.

4. Reaction due to the infected blood such as malaria, HIV, VDRL to be tested in donor's blood before bleeding time.
5. *Mismatched transfusion:* Proper cross-matching and also late reactions on the slide to be carefully watched before accepting the blood for transfusion.
6. Faulty technique and air embolism to be avoided carefully.

Blood Groups

There are four groups A, B, AB and O. And Rhesus factor called (Rh) factor. There also sub groups such as A1, A2, A3, etc. can be excluded by cross matching and waiting some time to see the matching is perfect.

"O" group is considered universal donor and AB universal recipient even then never transfuse the blood without cross-matching. The blood transfusion has become safe because of blood banks and expert services. Always keep the names and phone numbers of the blood banks at hand or blood of same group maybe required in larger quantities during cardiac surgery and may not be available in one blood bank only.

Types of Transfusion

1. Whole blood transfusion.
2. Exchange transfusion to avoid overload.
3. Blood component therapy.
   A. Red blood cells packed transfusion.
   B. Fresh frozen plasma.

The decision is made as per the need of recipient patient.

Indications

1. Acute blood loss.
2. Chronic anemia when the hemoglobin falls below 7 gm/dl.
3. Large quantities blood transfusion in cardiac and cerebral surgery.
4. In aplastic anemia the bone morrow transplantation is seriously considered by the experienced experts after due assessments and fulfilling the required criteria of suitability of donor and recipient to avoid the graft failure.

DISEASES OF WBC

When there are less than normal WBC, it is called leukopenia when there is marked leukopenia it is agranulocytosis and when there is increase of WBC. It is leukocytosis and if increase is enormous, it is leukemia. Accordingly following conditions are met in the practice.

1. Agranulocytosis.
2. Infectious mononucleosis or glandular fever.
3. Acute and chronic myeloid leukemia.
4. Acute and chronic lymphatic leukemia.

Agranulocytosis

It is very serious condition because of marked leukopenia. The resistance of patient is minimum and is prone to any infection fulminating and fatal.

It maybe due to either sensitization or toxic effect of drugs such as amidopyrins, sulphanamides oxyphenbutazones, etc. and it maybe due to contact with insecticides. In some cases, the cause is unknown which is called idiopathic agranulocytosis.

Excessive irradiation or cytotoxic drugs used in the treatment of malignancies or in leukemia and hypersplenism or even very severe infection. Bone marrow biopsy shows disappearance of granular cells and their precursors.

Clinical Features

Sore throat less responsive to usual local treatment is suspicious and blood count reveals diagnosis. Immediate fresh blood transfusion and antibiotic should be administered, IV without delay and repeat till the relief is obtained. Cure is not possible unless bone marrow resumes production of granulocytes which takes about a week or so. Protect

the patient from getting infections, isolate in a proper special room in the Hospital, to protect from cold, give nourishing diet with vitamins along with soft digestible food. Symptomatic treatment should keep up the patient to run over the crisis. Even than mortality is high in severe cases.

INFECTIONS MONONUCLEOSIS (GLANDULAR FEVER)

It is the result of virus infection common in children and young adults; starts with weakness, fever, headache, bodyache with enlargement of superficial lymph nodes. Petechial hemorrhages are seen at platelate and sore throat, cough, dry skin rash is not uncommon. Pain abdomen right lower due to mesenteric adenitis. Anemia and pallor becomes evident. Blood count shows leucopenia with atypical lymphocytes.

Diagnosis

It is confirmed by blood test for hetrophil antibodies.

Paul-Bunnell reaction is positive. WR may be false-positive.

Treatment

Avoid ampicillin as it gives rash. Select other antibiotic under cover of corticosteroid and symptomatic treatment such as anti pyretic analgesic, antiallergic, sedatives, local gargles of hot saline careful nursing and hot drinks soft palatable and nourishing diet till the acute phase is overcome. Recovery is usually complete unless there is serious unforeseen complications take place.

Leukemias

Disorder of unknown etiology when there is uncontrolled and abnormal proliferation of leucopoietic tissue in bone marrow associated with marked increase of number of WBC in one type in peripheral blood in which even immature forms are also seen.

Varieties (Table 11.1)

1. Myeloid leukemia when polymorphs are excessively produced.
   a. Acute
   b. Chronic
2. Lymphatic leukemia when lymphocytes are excessively produced.
   a. Acute
   b. Chronic
3. Monocytic leukemia when monocytes are excessive produced.
   a. Acute
   b. Chronic

Table 11.1: Differences between various Acute Leukemias

		Acute myeloid	*Acute lymphocytic*	*Acute monocytic*
1.	WBC count	20-50 thousand	About 70 thousand	15 to 45 thousand
2.	Dominant WBC	Myelocytes present in blood with myeloblasts	Lymphocytic with lymphoblasts in the blood	Monocytes with premature forms in the blood monoblast
3	Oxidose reaction	+	—	Dubious
4	Mouth	Gums swollen	Petechial bleeding bleeding, ulcers	Marked swelling of gums seen with bleeding, ulcers
5	Lymph glands	—	Enlargement +++	+ —
6	Spleen	—	++(Enlarged) mostly cervical	Palpable
7	Occurrence	Occurs in adults	Most common in children	Occurs in all ages but rare middle age

4. Aleukemic leukemia when total WBC count is normal but is the differential count may show excessive number of one of the type of cells and their precursors in the peripheral blood circulation.

Acute Leukemias

Onset is sudden, with fever severe bodyache, bleedings and anemia, ulceration in mouth and throat, enlarged lymph glands and usually running rapid course and ultimately fatal.

Clinical Features

Onset rapid, fever, severe weakness, increasing anemia and bleeding episodes, most commonly in mouth hyperthrophoid gums, purpura, joint pains, the spleen and lever palpable.

Diagnosis

Blood picture shows heavy leukocytosis except in aleukemic variety. Anemia and thrombocytopenia. Precurcess blastic cells diagnostic oxides reaction is helpful. Bone marrow biopsy is confirmatory.

Treatment of Acute Leukemias

1. Corticosteroid to prevent severity.
2. Antibiotics to prevent the infection.
3. Fresh blood transfusion to cross over the anemia and thrombocytopenia.
4. Chemotherapy for myelosuppression.

Drugs Used in Practice

A. Inj cytosine aroderinoside 100 mg/m^2 12 hourly IV infusion for 7 days + Daunomycin 45/M IV first 3 days + then same orally 100 mg/m^2 for 5 days.

Same course can be repeated after one month. The bone marrow recovery is to be assessed.

Prophylactic continuous low dose of heparin to prevent thrombosis.

B. Inj cytarine 100 mg/ml for acute myloid leukemia dose 100 to 200 mg daily IV infusion for 7 days (Dabur)

C. Cytocristin 1 ml vial

Dose 1.4 mg/m^2 weekly as maintenance treatment till bone marrow turns to normal.

D. Tab Endoxan—N 50 mg and
Inj Endoxan—N 500 mg, 1 gm
(German remedies) for maintenance treatment.

Treatment of Acute Lymphatic Leukemias

The combination of prednisolone, daunomycine and 1-asparginase is used with great advantage. For CNS infiltration as well as prophylaxis intrathically methotrexate (MTK) and cranial irradiation (18-24 RAH) is used with due caution.

Lastly the maintenance treatment should be continued with 6-mercaptopurin (6 mp) and MTK for about two years.

Even in expert hands in the specialized institutions, the prognosis is poor and relapses are not uncommon, except in cases of bone marrow transplantation (BMT) it is successful if the residual disease gets ablated with the help of radiochemotherapy and if the graft problems are successfully overcome.

Chronic Myohoid Leukemia

Age group affected is between 30 and 60 years. Incidence is equal in both the sexes.

Clinical Features

Onset is slow. There is progressive anemia with loss of appetite, weight loss, general weakness, splenomegaly if accompanied with infarction there is marked pain and tenderness, epistaxis and other hemorrhagic episodes take place. There is hepatic enlargement also. But the lymph nodes are usually normal.

Diagnosis

Blood examination shows anemia, thrombocytopenia, increased number of WBC up to 50 to 70,000 /cum. With precurser cells myelocytes or/and occasional myeloblast. Normoblasts are also seen. Bone marrow biopsy is confirmatory. High ESR and Bence-Jones protein in urine.

Treatment

Complete rest, hospitalization, effective symptomatic palliative treatment. Blood transfusions if necessary. Chemotherapy ensures satisfactory clinical improvements, but the condition is usually fatal in 2 to 3 years.

1. Myleran tab 4 mg/day till the improvement takes place. and then 2 mg/day as maintenance dose. The danger of uric acid going up can counter acted by giving allopurinol 300 to 400 mg/daily. It is free from toxic effects and can be safely administered. Localized radiotherapy to the spleen do show improvement and is worth giving a trial.

   Prognosis is poor and patient may survive about 3 years.

Chronic Lymphatic Leukemia

Age group affected is 40 to 80 years. More common in male. It is the commonest variety of leukemia.

Clinical Features

Onset very slow and also anemia appears very slowly. The lymph nodes are enlarged. They are discrete, firm, rubbery, but painless. The spleen is palpable (not very big as in myeloid leukemia). Recurrent infections are very common.

Diagnosis

Blood examination. There is increase in the WBC count with 90 percent small lymphocytes. Platelet count is low. There is anemia. The lymph gland biopsy is confirmative.

Treatment

Chemotherapy is useful. But corticosteroids are very valuable. Chemotherapy

a. Chloramphenicol 0.1 to 0.2 mg/kg of body weight per day.
b. Prednisolone in good doses to be continued till the clinical picture is improved then taper the maintenance dose for few months.
c. Radiotherapy to lymph nodes and spleen has got place in the treatment.
d. Prognosis it is better than chronic myeloid leukemia. Life span of the patient may extend 5 years to one decade.

RETICULOCYTOSIS (MALIGNANT LYMPHOMAS)

It is a neoplastic group of disorders affecting reticuloendothelial tissue in the body, manifested by enlarged lymph nodes and spleen without the blood picture of leukemia. When becomes wide spread, it involves bone marrow and hinder normal process of hematopoiesis, resulting in anemia and suppression of normal immunity mechanisms which is the real function of reticuloendothelial system. Biopsies from lymph node is diagnostic.

Hodgkin's Disease (Lymphadenoma)

It is a disorder where there is painless enlargement of lymphoid tissues in the body with progressive anemia.

Etiology: Unknown.

Clinical Features Usually occurs in 2nd decade, equally common in both the sexes. Onset is slow, swelling of lymph glands which is an important early manifestation, cervical, axillary, inguinal and then thorasic and mesenteric. These lymph node are painless, firm, rubbery and discrete and the skin over them is mobile. Their enlargement may cause pressure symptoms such as dysphasia, dyspnea, venous obstruction, jaundice and paraplegia. The spleen is palpable and there is increasing weakness, loss of weight, low irregular fever intermittently.

Diagnosis: Lymph node biopsy is diagnostic.

Treatment: No curative therapy is available and therefore, we depend upon palliative measures such as blood transfusion for anemia, local irradiation to counteract the enlargement of lymph glands and corticosteroids giving symptomatic relief. Antibiotics are essential because patient's defense mechanism is disturbed. Prognosis is poor and any serious infection is fatal.

Chemotherapy

1. Nitrogen mustards 1 mg/kg. Of weight IV inj for successive four days and ulternate days four injections.
2. TEM (Triethylenemelamine) 5 mg/day on empty stomach for 2 days, maybe repeated after one week.

Irradiation

a. Deep X-rays exposure locally to the lymph glands.
b. Radium is also used.
c. Radioactive P32 administration.

Surgery: If complicated by pressure symptoms the surgery has got the role.

Spleen and Causes of Splenomegaly

Normal spleen 100 to 180 grams weight is an to important organ of the body.

It serves reservoir of blood for increased requirement by circulation. It contains cells of reticuloendothelial system a part of defense mechanism. It also takes part in hemopoiesis in addition of bone marrow.

1. *Blood Disorders:* Pernicious anemia, choleric jaundice, hypersplenism, polycythemia vera, Hodgkin's disease, leukemia, infectious mononucleosis.

2. *Protozoal Disorders:* Malaria, kala azar, schistosomiasis, trypanosomiasis.

3. *Bacterial Infection:* Typhoid, septicemia, TB, SBE, syphilis.

4. *Cardiovascular Disorders:* CCF, cirrhosis liver, spleen venomous thrombosis.

5. *New Growth and Cysts:* Hemangioma, metastatic malignancies, Fibroma, lymphoma, reticulum cell sarcoma, Hodgkin's disease, hydatid cyst or dermoid cyst.

6. *Diploidoses:* Rare diseases such as Gaucher's disease.
Niemann-Pick's disease, Hand-Schuller-Christimic disease.

7. *Degenerative Disorder:* Such as amyloidosis.

Palpable about 2 fingers	*Moderately enlarged 3-4 finger spleen*	*Massive enlarged 7-8 finger spleen*
Acute malaria	Portal hypertension	Chronic malaria
SBE	Rickets	Chronic myeloid leukemia
CCF	Hemolytic anemias	Kala azar
Typhoid	Currhosis liver	Thalassemia
Brucellosis	Acute leukemias	Cooley's anemia
Syphilis	Infectious mononucleosis	Niemann-pick disease
Millary TB	lymphoma	Gaucher's disease
Septicemia	Polycythemic vera	
Viral infection	Chronic lymphatic leukemia	
Aids	Hodgkin's disease	
Constructive Pericarditis	Amyloidosis	

8. *Vitamin Deficiency Disease* Rickets—
Clinically we consider palpable spleen (2 Fingers) moderately enlarged spleen and massive enlarged spleen (7-8 finger spleen).

Indications of Splenectomy

1. Splenic trauma.
2. Hereditary spherocytosis.
3. Hereditary elliptocytosis.
4. Idopathic thrombocytopenic purpura.
5. Thalassemia major.
6. Hypersplenism.
7. Splenic tumor and cysts.

FUTURE PROSPECTS OF HEMATOLOGY

This specialty is fast growing due to various research centers and specialized sections in the Hospitals and Institutions.

Blood Banking has provided invaluable facility of blood replacement therapy and has made major cardiac and cerebral surgery possible. The social movement of blood donation camps in gaining public popularity and the problem of stocking blood in the banks has become easy. The life of collected blood is about 14 days and if not used the RBC and plasma are separated and RBC packed cell infusion has become popular in post-partum cases which reduce their anemia and hospitalization period and the frozen plasma can be given to the patients of hypoproteinemia and nephrotic syndrome.

Through progress in research the hazards of blood transfusion will disappear and transfusion will be safer. Worldwide research is going on for leukemia and we maybe able to irradicate the cause and cure the condition totally in future, a most optimistic expectation. Genetic engineering may go ahead to help us to prevent or modify the hereditary disorders and outlook may change with optimistic angle. The progress in immunology is finding out vaccines for AIDS and maybe successful to prepare auto vaccine for malignant tumors or leukemia to modify the course of the disease and give relief to the patient on one hand and increase the life span of the patient on the other.

The bone marrow transplant (BMT) technique and procedure may become simple and popular and cases of hypoplastic and aplastic anemia's will have bright future and can lead almost normal life. It may proceed further to transplant part or full bone graft and minimize the time factor as well as increase the cure rate to the maximum.

Chemotherapy maybe advanced to the extent from palliative to radical curative climax that will come in the field of surgery and the risk will narrow down gradually unless in the patients who approach late. The surgical advances with the help of laser beams will reduce the bleeding to almost nil and need for massive transfusions will be less and less, day-by-day.

Better drugs are expected to come to meet the hematological emergencies that will become popular in hospital practice and also will be available to the general practioners to prevent bleeding instantaneously.

Endocrinology 12

INTRODUCTION

Previously these glands were called ductless glands; endocrine itself means glands secreting internally directly in bloodstream. Following endocrine glands are present in human body.

1. Pituitary gland in the head.
2. Thyroid and parathyroid glands in the neck.
3. Adrenal glands and islets of Langerhans' in pancreas secreting insulin are present in the abdomen.
4. Ovaries in the abdomen.
5. Testis below abdomen in the scrotum.

Product secretions of these glands are called hormones. There are three types of human hormones.

1. Amino acid analog such as thyroxin.
2. Polypeptides such as insulin, growth hormones, prolactin.
3. Liquids such as steroids, vitamin D.

The target cells in the body have got the receptor mechanism to accept the hormonal message and chemically react to it as per the message positively or negatively until the further message is received.

Diagnostic Method of Hormonal Assay

1. Radio immunoassay.
2. Competitive protein binding.
3. Fluorometry.
4. Cytochemical techniques.

Practising clinician has to get acquainted and become familiar with the investigating aspect to make use of it in practice and to read and understand the reports.

The isolation and synthesis of hormones and their analogues are invaluable inventions in treating the endocrine disorders successfully.

Understanding the role of hypothalamus in health and diseases has provided a guiding therapeutic index to the clinician specially when synthetic hypothalamic hormones are at hand, to control the pituitary hyper and hypofunctions and treat the patients confidently.

Due to advanced investigative facilities, the early detection and prompt effective treatment has become possible, reducing mortality and morbidity to a greater extent.

Disorders of the Pituitary Gland

The pituitary gland has got two lobes.

1. Anterior lobe.
2. Posterior lobe.

1. Anterior lobe: Produces following hormones.
   a. Somatotropic hormone: Affects growth and metabolism.

b. Thyrotropic hormone: Affects growth and function of thyroid gland
c. Corticotropic hormone: Affects adrenals in producing corticosteroids and assists in metabolism.
d. Gonadotropic hormone: Affects the function of ovaries and testes.
e. Lactotropic hormone: Affects the regulation of lactation.
f. Melanotropic hormone: Controls the pigmentation of skin.

Clinical conditions produced by hyposecretion of pituitary gland.

When one or two hormones are deficient,

1. Dwarfism.
2. Infantalism.
3. Sheehan's syndrome
4. Simmonds' disease.

Clinical conditions due to over secretion of pituitary hormone or hormones are as below.

1. Gigantism.
2. Acromegaly.
3. Cushing's syndrome.
4. Precocious puberty.

2. Posterior lobe: It contains neurohypophyseal mechanism through vasopressin hormone causing diabetes insipidus characterized by excessive polyurea and polydipsia. The patient may pass about 20 liters of urine in 24 hours.

Treatment

Sympathetic analog of vassopressin (DDAVP) desmopressin which is given intranasally like snuff (preferred form of treatment) although it can also be given by IV injection.

Pituitary Dwarfism

There maybe normal size and weight at birth. Growth is hampered from early childhood. More common in boys. Face looks immature, growth is stunted and they look pudgy with fat accumulated over the iliac crests and lower abdomen. Secondary dentition is delayed. Their intelligence is normal. Occasional hypoglycemic attacks are seen. Secondary sex character is delayed. Turner's syndrome in which there is infantilism, web neck, infantile breast, vagina and genitals.

Diagnosis

Diagnosis is confirmed by serum growth hormone level.

Treatment

Injection of growth hormone 0.5 to 0.7 IU/kg/week subcutaneously at night to be divided in seven daily doses.

Infantalism

Retarded skeletal growth and sexual development, pleasing appearance, baby skin, subnormal height and weight, absence of axillary hair, pubic hair and breast development in girls. They look childish for their age. History of head injury, encephalitis or birth injuries or presence of concomitant chronic infection such as TB congenital syphilis, renal rickets juvenile diabetes or congenital heart diseases or rheumatic heart diseases are common.

Treatment

1. Treat the underlying disorder.
2. Endocrine treatment.
   a. Growth hormones injection—results not promising.
   b. Thyroid administration is helpful—can be given orally.
   c. Gonadotropic hormone useful in males.
      Dose: 500 mg IV inj IM weekly for 10 to 12 weeks courses can be repeated with the intervals of 2 to 3 months, if the response is less dose maybe doubled in the next course, if needed.
   d. Testosterone 5 to 10 mg IM biweekly or 25 to 50 mg of methyltestosterone orally/day has proved useful.
   e. Estrogens in girls orally 1 mg/day maybe tried but if improvement is slow then the period of administration is prolonged for a few years.

Adult Hypopituitarism or (Sheehan's Syndrome)

Mostly seen in women between the age group of 20 to 40 years. It is always after postpartum bleeding, shock. There is failure of lactation. Breasts dry up and become small, disproportional debility.

Diagnosis

By hormonal assays of pituitary hormones.

Treatment

It is similar to infantilism but doses are high; and duration is prolonged.

Simmonds' Disease

This is a disease of ladies caused usually after delivery, maybe due to thrombosis or embolism of pituitary vessels.

It can also occur by damage to pituitary gland by tumor or cyst or chronic infections such as TB, syphilis.

Clinical Picture

Marked emaciation, loss of weight, asthenia, and depression, loss of axillary and pubic hair, amenorrhea and sometimes spells of unconsciousness.

Treatment

Hormone replacement therapy.

Pregnancy may cure the syndrome because of physiological changes in the pituitary gland.

Diseases due to Oversecretion of Pituitary Hormone

Gigantism

The changes start from birth is common in males usually due to eosinophils, tumor of pituitary.

Clinical Picture

Excessive tall man lean not fatty person, sexual precocity, hypertrichosis, glycosuria exhaustion, weakness, impotence, headaches and other symptoms of cerebral tumor.

Treatment

Surgical excision of the tumor or irradiation with X-ray, in early cases estrogens and androgens inhibit the pituitary overactivity.

Acromegaly

Occurs after the age of 30 years, sex distribution is equal, caused by eosinophils, adenoma of pituitary gland after the bony epiphyses are united. The pressure on optic chiasma and cranial nerve cause bi-temporal hemianopia and then partial or complete blindness, ocular palsies, deafness, hemiparesis, mental changes and convulsions, headache, vomiting and increased CSF pressure. hands and feet are enlarged, hands are square and spade like enlargement of facial bones and there is a projection of mandible forward, teeth are spaced apart, clavicles are thickened, spine deformities scoliosis, lordosis, kyphosis, facial bones are enlarged. Tongue is thick along with nose and lips, skin is thick, skeletal muscles are hypertrophied. Heart is enlarged and there is hypertension, deep voice, sluggish speech, impaired memory depression, impotence and glycosuria is present and BMR, is increased. There is an excessive hair growth on trunk, abdomen, hands and feet.

Treatment

Surgery for tumor or X-ray irradiation, and the outlook is disappointing.

Cushing's Diseases

It is due to corticotropic cell adenoma. These tumors are small and difficult to detect. It is common in girls where there is rounded moon shaped faces and marked truncal obesity.

Treatment is unsatisfactory

Hyperactivity of Posterier Lobe of Pituitary Diabetes Incipidus (as discussed above)

Rare disorder where there is persistent excessive polyurea and constant thirst (Polydipsia).

Etiology

When pituitary gland is damaged, at the level of vassopressin, the re-absorption of water in renal tubules is withheld giving rise to diabetes insipidus.

Clinical Features

Patient passes more than 20 liters of urine in a day. The urine is clear and watery. Other causes damaging the pituitary glands are head injury, syphilitic gumma, TB, or tumors all attempts are done to establish the diagnosis in the particular case in order to treat and give relief to the patient. Surgery has got a limited role to excise the tumor and the surgical approach is not easy and the operative risk is also very high. TB, syphilis are medically treatable. Hormonal treatment for the condition is available. The synthetic analogue of vasopressin (DDAVP) Desmopressin to be given intranasally as snuff twice a day. It can be given by injection also. The thirst is suppressed by chlorothiazide clofibrate and carbamazepine which have proved positively helpful.

Thyroid Gland

It has got two lobes and an isthmus, lies in the root of neck opposite to the upper part of trachea. It has got a rich blood supply.

The parathyroid glands, four in number, are embedded in the posterior part of the thyroid gland. Iodine is required for the formation of thyroid hormones.

Thyroid hormones are as follows:

A. Thyroxine T4.
B. Thyroxine T3 are secreted by thyroid gland; T3 is more rapidly acting than T4. Both act directly on all cells of the body and increase the cellular metabolism.

Control of Thyroxine Producing Mechanism

It is through hypothalamus which secretes TRH (thyrotrophin releasing hormone) which acts on pituitary gland which secretes TSH (thyroid stimulating hormone) acting on thyroid gland to produce more thyroxine (Now TRH hormone is synthesized and available for clinical use).

Clinical Disorders of Thyroid Gland

1. Hyperthyroidism (thyrotoxicosis) or Graves' disease.
2. Thyroiditis.
3. Iodine deficiency goitre.
4. Hypothyroidism
    a. Cretinism.
    b. Myxedema.

Thyrotoxicosis (Graves' Disease)

It is an autoimmune disorder in which antibodies are directed against (TSH) thyroid stimulating hormone receptors.

Etiology: When abnormally excessive circulating thyroid hormones T3 and T4 are present in the circulation then it is obviously due to overactivity of uncontrolled TSH, (Thyroid stimulating hormone).

Clinical features: It is eight times more common in women and commonly occurs in young age. Familial history is positive. There is a background of emotional stress or trauma. Apprehension, anxiety, restlessness, tremors, loss of weight even increased appetite, tachycardia even in sleep. Hands and feet are warm. Face flushed exophthalmos and ophthalmoplegias. While looking down the upper lid lags behind, while looking up there is no wrinkling of forehead, blinking is infrequent, inability to cover the eye completely and palpebral fissure is wide. There is difficulty in averting the upper lid. Fat depots on body disappear. Intolerance to heat, diarrhea; impotence or amenorrhea in females, profused perspiration, premature graying of hair, myopathies, generalized weakness, goiter on neck with bruits heard over gland. When there is an acute precipitation of symptoms as mentioned

above it is called thyrotoxic crisis which is considered as an emergency and is usually precipited by acute infection requiring prompt attention and management.

Investigation: BMR, T3, T4, TSH measurement. Serum cholesterol, radioactive I^{131} up take, an autoantibody screen study, thyroid ultrasound test.

Treatment

A *Iodine Therapy*

1. Liquid calloidal iodine 1 to 2 TSF tid (Duphar).
2. Liquid collosol (iodine) 1 to 2 TSF tid (Solvey)
3. Liquid colloidal (iodine) 1 to 2 TSF tid (Crooks).
4. Lugol's iodine (5% iodine +10% potassium iodine orally).
5. Injectable di-iodotyrosine.
   1 cc (20 mg) 2 to 3 times/week IM for 2 to 3 weeks. Repeat if needed after 6 months.
6. Radioactive iodine I^{131} a single dose treatment is quite reliable and useful in experienced hands.

B. *"Antithyroid" Compounds*

1. Carbimazol tablets
2. Propylthiouracil

Duration of action 12 to 24 hours.
To show beneficial effect requires 4 to 8 weeks.

Indication: Thyrotoxicosis, intractable CCF, paroxysmal tachycardia, angina pectoris.

Adverse effects: Headache, arthalgia, rash, loss of hair, sore throat, mouth ulcers, jaundice.

Contraindication: Tracheal obstruction.

Dose: Start with 15 mg/day increase upto 45 mg/day gradually in divided doses.
Preparations available in practice are as follows:

1. Tab neomercazole 5, 15, 20 mg (Pramel Health Care).
2. Tab thyrozole 20 mg (Cadila Pharma).
3. Tab propylthiouracil 200 to 300 mg/day takes longer time.
4. Intramil 500 mg/day 1 od (it is slow acting)

C. *Cortisone*
12.5 to 25 mg/day with testosterone inj 25 mg thrice weekly has proved useful.

D. *Surgery*
Partial thyroidectomy has been proved useful specially when pressure symptoms are present.

E. *Radioactive Iodine Therapy*
Single oral dose of 4-8 millicuries is sufficient. Second dose if needed after 4 months, if hormonal assessment indicates.

General treatment: Hospitalization, careful nursing, symptomatic and palliative treatment, nourishing diets, with vitamin is necessary. During crisis O_2 is to be added to all the other drugs used in emergency treatment of CVS complication GI and cerebral manifestations.

Thyroiditis

It is a result of either infection or due to autoimmune process, chemical or radiation injury, clinically present as acute, sub-acute or chronic stages.

Acute Thyroiditis

It is due to bacterial, viral, fungal or irradiation induced. It is quite painful.

Sub-acute Thyroiditis

It is due to postpartum thyroiditis. It is painless and silent and maybe due to viral infection.

Chronic Thyroiditis

It is usually due to autoimmune called "Hashimoto's disease."

Treatment

Mostly palliative, thyroxin and TSH is monitored and symptoms and signs are improved by their administration.

Goiter

An enlarged thyroid that can be made out from a distance is called goiter. On examination, the size, shape, consistency, symmetry, nodularity and surface motilities and adherence to surrounding structure is made out and recorded. Never forget to auscultate on the thyroid for bruit, regions of the country where iodine is deficient in drinking water. There is endemic goiter. Bruits and thrills do not occur in simple goiter but pressure symptoms are common.

Treatment

Thyroxine 1 to 2 years (and not potassium iodide). Surgery usually when pressure symptoms are present.

Cretinism

Symptoms start from birth, mild respiratory difficulties, prolonged physiological jaundice, feeding difficulties, child does not cry much. He sleeps comfortably with mouth open, umbitical hernia, hypotonia, less attentive, hearing is less, milestones are remarkably delayed, sitting, crawling, standing is defective and delayed, marked constipation when started walking, the gait is shuffling. Growth is retarded.

Diagnosis

1. Thyroid function test for T3, T4,TSH and TRH.
2. Thyroid antibody test.
3. ECG.
4. BMR.
5. Radioactive iodine^{131} intake test.

Treatment

Replacement therapy by thyroxine 1.5 to 2.5 mmg/kg/day. Adjust dose with blood level of T4 and TSH.

Myxedema

Due to thyroid deficiency in adults, all the metabolic functions of all the systems are abnormal and slow and manifest functional deficiency.

Common in females, at the menopausal age. Manifested by loss of hair, lateral part of eye brows, loss of appetite and enthusiasm, laziness, weakness, apathy, confusion, loss of memory, increase in weight, swollen appearance anginal pains, bradycardia, low voltage in ECG. Flat or inverted "T" waves. Slow slurred speech, hearing defect, anorexia, constipation, amnesia present. There is hypercholesteremia, subnormal GTC response, BMR low, Hoarse and husky voice, friable nails. It can be a localized example of pretibial myxoedema. When it is in children, it is called Juvenile myxedoma, where their growth is stunted, delayed sexual maturity and mental deficiency.

Treatment

Thyroid extract tab by mouth, increase the dose but gradually under supervision and tests and clinical records with repeated check up. The improvement is remarkable. But they require personal care and management until they can look after themselves.

Parathyroid Disorders

There are four small endocrine glands embedded in the hind portion of thyroid gland at the root of the neck and they control the calcium and phosphorous metabolism in body as well as osteocytic and osteoclastic activities in skeletal bones through the parathyroid hormones.

Clinical Conditions

a. Hypoparathyroidism-Tetany
b. Hyperparathyroidism-Nephrocalcinosis.

Tetany

Carpopedal spasms, laryngismus stridulous and convulsion are seen in children whereas the serum calcium falls is called tetany; where there is increased excitability the peripheral nerves get affected. Alkalosis and magnesium depletion are also contributory factors.

Clinical Features

In children the characteristic traits as mentioned above. The hands look like carpopedal spasm, and spasm of glottis causes laryngismus stridulus and convulsions may occur.

In adults painful cramps, accoucheur's hands and tingling and numbness in the hands and feets are seen frequently.

Latent tetany is only manifested by putting cuffs for taking BP No sooner the cuff is inflated it precipitate the spasm in the hand. If tapped on parotid, the facial muscles contract.

The serum calcium is low due to less intake, malabsorption, vit. D deficiency and chronic renal failure. Alkalosis can occur due to persistent vomiting, excessive alkalies consumption or hyperventilation.

Treatment

1. Calcium gluonate 10 percent 10 IV slowly.
2. Calcium by mouth (one tab 1.25 mg/day).
3. Vit "D" is also useful.
4. For chronic renal failure, repeated hemodialysis and renal transplant.

General, symptomatic and palliative treatment is most important for giving relief and confidence to the patient.

Hyperparathyroidism

There maybe parathyroid adenoma or carcinoma, hyperplasia is seen in chronic renal failure. Bones are affected causing osteitis fibrosa and cysts formation.

Clinical Features

Renal calculi, nephrocalcinosis, pyelonephritis, renal failure and uremia, weakness, anorexia vomiting, peptic ulcer, backache, acute pancreatitis, X-ray bone show demineralization and even cysts.

Treatment

Surgically removal of solitary adenoma can cure. But in generalized hyperplasia and multiple adenomas, the outlook is poor and death is inevitable due to renal failure.

The Adrenal Glands

Two adrenals glands on upper pole of each kidney. Each has got inner medullas secreting adrenaline and nor-adrenaline and the outer cortex which has got three zones:

A.	Zone glomerulosa	About 40 steroid hormones are secreted including glucocorti coids mineralocorticoids and androgens.
B.	Fasciculus	
C.	Reticulosis	

Adrenocorticotropic hormone (ACTH) is the most important product controlled by stress. It can alter the rate of biosynthesis and secretion of glucocorticoid and cortesol and adrenal androgens such as androstenedione.

In addition to stress there are other mechanisms which control ACTH are namely negative feedback and diurnal (Nyctohumeral) rhythm. The negative feedback operates through hypothalamus. The reduction in the level of plasma cortisol leads to increased secretion of ACTH; while rise in plasma cortisol produces rapid suppression of ACTH. The stress is caused by trauma, severe pain, fear, nausea, high fever and hypoglycemia. All these increase the ACTH release.

The glucocorticoid is antagonist to insulin tending to rise BSL, whereas insulin lowers the blood sugar level.

Hyperfunction of adrenal cortex is associated with Cushing's syndrome.

Whereas primary adrenocortical deficiency causes "Addison's disease."

Cushing's Syndrome

It occurs due to chronic glucocorticoid excess; when there is bilateral aderenocortical hyperplasia due to raised ACTH secretion.

Clinical Features

The patients are usually middle-aged women with central truncal obesity, plethora, and hypertension (Weakness, fatigue, emotionally labile, moon face, osteoporosis). The sites of production of these

hormone outside the adrenals are: Bronchogenic cancer, thymus tumors and tumors of pancreas, ovary and thyroid). Onset of this syndrome maybe sudden and skin pigmentation is always present. Fat accumulates on the upper part and the back looks like "buffalo hump." The face is round due to deposition of fat in the cheeks called "moon face." Patient develops proximal myopathy. There is hypokalemia which adds to muscular weakness osteoporosis may cause pathologic fractures, vertebral collapse causes deformities and reduction in height. Peptic ulcers are common. Emotional changes are frequent leading to psychosis and depression. Women show acne, hirsutism, oligomenorrhea or amenorrhea. Acute and chronic infection like TB, septicemia are commonly seen. There is delayed wound healing.

Diagnosis

1. Plasma cortisol level repeated assays.
2. Urinary 17 ketogenic and 17-hydroxycorticosteroid estimation.
3. Plasma "ACTH" estimation which is considerably increased.

Treatment

1. Pituitary microsurgeries is the method of choice and if successful gives 100 percent cure.
2. Excision of adrenal tumors
3. Drug treatment:
   (a) Metyrapone 1 to 2 gm/day.
   (b) Aminoglutethimide 1 gm/day.
   (c) Mitotane 3 to 6 gm/day.

These drugs are very costly and have got side effects and the outcome is also unpredictable.

Addison's Disease

There is progressive destruction of adrenals due to TB (70%), syphilis, amyloid disease, neoplasm, vascular lesions or pyogenic infection.

Before the signs and symptoms appear about 90 percent of the gland is destroyed.

BP is low (there is hypotension) maybe due to disturbance of electrolyte balance.

Gastrointestinal symptoms are due to vagotonia and alkalosis. Pigmentation a cardinal sign is due to disturbance of tyrosine metabolism and excessive melanin. Blood sugar level is low causing hypoglycemia syndrome.

Clinical Features

On set is gradual, pigmentation of skin and mucous, membrane, lips, gums, inside cheeks and palate more marked on pressure points and knuckles. Anorexia, nausea, vomiting and diarrhea. Fainting syncopic attacks due to hypotension, muscular weakness, cramps in the legs, lassitude, apathy, depression, loss of memory, restlessness, impotence, subnormal temperature, low BMR occurs.

Addisonian Crisis

It is an acute emergency when patient collapses and becomes unconscious. It is usually due to acute severe infection, extra-exertion, or reduction of doses of corticoids being given as treatment, or after severe diarrhea and dehydration. Blood exam shows low sodium and chlorides while potassium is raised.

17-ketosteroids and 17-oxycorticosteroids are low.

Treatment

It is hormone replacement therapy for whole of patient's life.

Prednisolone 5-7.5 mg/kg/day and dose maybe doubled during stress and acute infections.

Treatment of Addisonian Crisis

It is serious medical emergency requires prompt treatment.

1. 5 percent glucose saline drip IV.
2. Hydrocortisone 100 to 200 mg IV to be repeated 4 to 6 hourly.
3. Antibiotics in IV infusion.
4. Perfect general and symptomatic and palliative treatment and constant nursing care.

Constant repeated checks of blood pressure, pulse, respiration and temperature, blood and urine exam every day till the patient comes out of crisis and is stabilized on routine maintenance treatment.

Pheochromocytoma

There are the tumors of chromaffin tissue of adrenal medulla (90%) or any part of sympathetic chain from carotid body to pelvic region, and secrete the catecholamines (adrenaline and nor adrenaline). The tumors are benign.

Clinical Features

There is paroxysmal or sustained hypertension associated with extreme skin pallor, sweating, palpitation, headache, epigastric pain and discomfort. The patient is apprehensive during the paroxysm.

Diagnosis

1. Presence of VMA in urine.
2. Adrenal venography shows the location of the tumor.

Treatment

Surgical excision.

In emergencies due to hypertensives crisis give phentolamine 5 mg IV injection.

Gonadal Disorders

Sex glands

a. Pair of testis in males.
b. Pair of ovaries in females.

Testis form sperms and ovaries ovum. Apart from gametogenesis they have got other important function of secreting the sex hormones and chemically the steroids. The testicular steroid is testosterone and from ovary estrogens. Both male and female sex hormones circulate in the blood and act on the target tissues.

The corpus luteum secretes progesterone.

Clinical conditions arise due to:

1. Hypogonadism (Male infertility).
2. Hypergonadism (Precocious puberty).
3. Cryptorchidism (undescended testis).
4. Testicular tumors.

Similarly in case of ovaries:

A. Hypogonadism causes delayed puberty.
B. Absence or failure of menstruation.
C. Menopause.
D. Hypergonadism—causing precocious puberty.
E. Hypogonadism (Female infertility).
F. Hersutism: Surgical corrective procedures are necessary along with the use of sex hormones at appropriate occasion is quite helpful.

Diabetes Mellitus

Definition

It is a condition of hyperglycemia due to deficiency or less effectiveness of hormone insulin secreted by beta cells or islets of langerhans of pancreas. The disease is chronic and causes metabolic derangement of carbohydrate, proteins, fat, water and electrolytes as well as causes structural and functional irreversible changes in body cells and vascular system mainly affecting eyes, kidneys and nervous system.

Etiological Classification

A. Primary (idiopathic) diabetes.
B. Secondary diabetes.

Primary (Idiopathic Diabetes)

This is the commonest variety, clinically come across:

1. Juvenile type found in children and which is always insulin dependent.
2. Maturity onset diabetes non-insulin dependent contributing factors:
   (i) Heredity: Family history positive, twins are both affected. If both parents are diabetics, all children are likely to develop diabetes.
   (ii) Endocrine: Factors, pituitary, adrenal and thyroid disorder there is hyperglycemia.

(iii) *Age:* 80 percent diabetes appears at the age of 50 years and highest incidences are between 60 to 70 years.

(iv) *Sex:* Younger grownup males and in older women predominant especially after multiple pregnancies in obese women.

3. *Dietic Factor:* High carbohydrate and sweet intake by obese individuals who are already overweight are likely to become diabetic.

Infection of Pancreas

Causing pancreatitis cause damage to islets producing insulin can cause diabetes, virus diseases such as mumps, affect pancreas.

Autoimmune Disorders

Coexistence of diabetes with autoimmune disorder maybe considered that the antibodies affect adversely on insulin production.

Secondary Diabetes

1. *Pancreatic:* Such as pancreatitis, hemochromatosis, carcinoma of pancreas, post pancrectomy.
2. *Insulin antagonists:* Such as growth hormone, cortisol, Cushing's syndrome, increased sensitivities of insulin in Addison's disease.
3. *Adrenalin:* It raises the blood sugar level and suppresses the insulin production.
4. *Thyroid hormone:* In excess causes diabetes
5. *Gestational diabetes:* Hyperglycemia of pregnancy.
6. Due to administration corticosteroid and thiozide diuretics.

Clinical Features

Polyurea, polydispsia, polyphagia, loss of weight, general weakness, nocturnal cramps, blurring of vision, balanitis, candidiasis.

Metabolis: Ketosis leading to diabetic coma.

Degneration: Arteriosclerosis, coronory and cerebral disorders, due to thrombosis or hemorrhages.

Ophthalmic: Errors of retraction, cataract, retinopathy.

Infection: TB Pyelonephritis, gangrene.

Skin: Pruritus in groin, carbuncles, furunculosis, xanthoma diabeticorum and dermatitis

Sexual: Impotence, early menopause, reduction fertility; lack of libido.

Hepatic: Hepatomegaly due to fatty infilteration.

Pregnancy: Miscarriages and abortion, stillbirths, big baby syndrome, high fetal mortality.

Nephropathy: Albuminuria, hypoproteinemia, *Neuropathy:* Peripheral neuropathy tingling and numbness.

Kitoacidosis: Causes "air hunger," dehydration and coma.

Apart from established cases of diabetes two other forms of unestablished diabetes are to be kept at the back of mind and they are as follows:

1. Potential diabetes where the family history is strongly positive and who have shown uric sugar positive during pregnancy or infection and who are obese and overweight.
2. Latent diabetics in whom the blood sugar level is normal but they are known children of diabetic parents and show urine sugar positive under stress, strain, games, pregnancy and infection only or while they are getting corticosteroid for treatment of other ailments.

Diagnosis

1. Glucose tolerance test.
2. Urine for sugar and ketone bodies (Acetone).
3. X-ray abdomen for calcification of pancreas.
4. X-ray chest to exclude pulmonary TB.
5. VDRL and HIV, blood urea, serum uric acid and creatinine.
6. Postprandial blood sugar level and urine sugar.
7. ECG.

8. Funduscopy for diabetic ratinopathy.
9. Ultrasound sonography for fatty liver and pancreas.
10. Glycosylated hemoglobin for assessing the proper control of disease with treatment.

MANAGEMENT OF DIABETES MELLITUS

Aims of Treatment

1. To prevent hyperglycemia and hypoglycemia and the symptoms of diabetes.
2. To control the weight and keep it within the normality according to height and age.
3. Stick to the prescribed dietic regime and exercises for lifelong.
4. Prevent complications of diabetes by constant check-ups.

About 50 percent of new cases of diabetes can be controlled adequately only by diet alone.

About 30 percent requires hypoglycemic drugs along with diets and exercises.

About 20 percent requires insulin replacement along with diet and exercises.

Diet: The sheet anchor of anti-diabetic treatment is strict dietic regime, exercise and weight reduction. Avoid rice, potato, sugar and fats and keep total caloric intake limited as per the advice of dietician. Use sugar free tablets or equal the sweetening substitute in place of sugar. Keep regular record of weight and reduce it by cutting down the caloric intake on one hand and increase the regular exercises and games on the other. Keep the time table of food intake for 24 hours, quantitatively small by increased frequency to maintain blood sugar level evenly in 24 hours. Thus, the morning tea and biscuits, breakfast, 11.00 am a cup of milk or coffee with a biscuit, lunch at mid day, 4.00 pm tea with toast, dinner at night and supper before going to bed. Keep adequate quantity of vegetables, fruits with meals and strictly avoid grabbing junks in between the timetable and alcohol consumption.

The 1,000 to 1,600 calories for average adult and 1,400 to 1,600 kcal for elderly seems to be an ideal in take.

Average carbohydrate 46 percent, more protein 12 percent and less fat 42 percent to be aimed to keep up the balanced intake. Carbohydrates to be sufficient to prevent ketonurea. All carbohydrates should be in the shape of starch and avoid glucose and sucrose because they can cause sudden rise of blood sugar level.

Taking into growth factor in case of Juvenile diabetics adequate protein in take to be maintained because they are insulin dependent and their appetite is also very good as their physical activity is also more. Fats should not exceed 50 to 150 gm/day. It is necessary to give the list of exchanges to maintain the variety of food to keep up the interest in food intake. Alcohol better to be avoided.

Oral antidiabetic agents are used for non-insulin dependent type II diabeties called (NIDDM) to be used in the patient who are not controlled only by diet restrictions although the diet control is essential even after the oral antidibetic drugs are used.

Following therapeutic agents are used in practice.

a. Sulphonylurea is mildest, safest and the action remain for 6 to 8 hours therefore it is to be given 3 times a day. Dose 1 to 2 gm/day, usually Rastinon is used 500 mg/day There is weight-gain due to this drug and therefore to be avoided in obese patient.
b. Chlorpropamide half-life is 36 hours and can be used as a single dose per day at breakfast. Dose can be increased up to 375 mg per day if required.
c. Newer sulphonylureas such as acetohexamide, tolazamide, glibenldamide, glipizide may prove useful in some cases.
d. Biguanide is avoided due to gastrointestinal tract problems and can be used in overweight patients.
f. Metformin no GI side effects dose 0.5 to 1.0 gm/day contraindicated in renal and hepatic diseases.

Following drugs are used in clinical practices:

Oral hypoglycemic drugs (non-insulin dependent diabetics—Ni DDM).

1. Tolbutamol.

   Action: Lower blood sugar level, when dietary treatment alone proves inadequate.

   Dose: 1 gm single daily dose, not to be used in pregnancy and children or in complication of diabetic side effects, nausea, flatulence, skin rash. **Not to be given in obese because it increases weight**.

Preparations used in practice are as follow:

1. *Tab Restinon* 500 gm (Avartis).
2. *Chlorpropamide.*

   Action: Stimulates insulin production, inhibits the liver to release glucose, increase the peripheral utilization of glucose.

   Dosage: 100 to 250 mg od after breakfast maximum 500 mg.

   Contraindication: Hepatic insufficiency, anti hypertensive drugs, pregnancy, surgery, stress, not to be given in children.

Preparations used in practice:

A. Tab Chlorformin

Chlorpropamide 50 mg + henbosmin ½ bd (Cadila).

B. Tab Copamide 250 mg (Deys).

(3) Biguanides (Metafosmin, Pheformum, DBI, Glyciphyoid) No association with obesity it has got synergism with rastinon. They enhance peripheral glucose utilization metformin less likely to produce GI contradiction phenoformin (contraindicated) in hepatic and renal diseases. They also suppress hepatic glucogenesis and inhibits intestinal absorption of glucose.

Preparations used in practice are as follows:

A. Tab Baynet 500 mg (Bayer)
B. Tab DBI (Phenposmen) 25 mg (USV)
C. Tab DBI TD (Phenposmen) 50 mg
D. Tab Glumet (Metformin) 500 mg (Cipla)
E. Tab Glyciphare (Metformin) 250, 500, 850 gm (Franco Indian).

Dose: Start with 250 mg tid after food. Increase maximum 3 gm.

(4) *Pioglitazoe:* It decreases insulin resistance in the periphery and in liver.

Dose: Initially 15 mg in 30 mg/day gradually increase.

Preparations used in practice are as follows:

1. Tab G. Tase (Pioglitazol) 15-30 mg (Uni Search)
2. Tab Glizon (Pioglitazol) 15-30 mg (Cadila)
3. Tab Opam (Pioglitazol) 15-30 mg (Wock Hardt)
4. Tab Pioglan (Pioglitazol) 15-30 mg (Star Care).

(5) *Rosiglitazone:* It improves insulin resistance.

Dose: Initially 4 mg od maybe increased to 8 mg/day.

Preparations used in practice are as follows:

1. Tab Enselin 2-4-8 mg (Torrent)
2. Tab Rezult 2-4-8 mg (Sun Pharma)
3. Tab Senzia 2-4-8 mg (Cipla).

(6) *Chromium Picolinate:* It is a nutritional supplement and increases the efficiency of insulin to the optimal level and reduces obesity.

Daily dose: 200 to 1000 mg.

Preparations available for use is as follows:

1. Tab CP 200 and CP 500 (Balpuana).

(7) *Guargum granules:* Slows the intestinal absorption of carbohydrate and reduces postprandial blood sugar level.

Preparation used in practice is granules nosulion 100-300 gm (Deys).

(8) *Glucomannan:* Reduces blood sugar level and serum lipot.

Dose: On sachet before meals.

1. Sachet dietmann 500 mg, 1 gm (Zydus Medica).
2. Sachet Dietmann Flaposoder 1.2 gm (Cadila Health).

(9) *Glucagon:* It promotes glyconeogenesis in liver.

Dose: Inj 0.5 to 1 mg sc/IM/IV.

1. Inj. Glucagen 1 mg/mi vial (Torrent).
2. Inj. Glucagen 1 mg/ml vial (Knott).

INSULINS

From animal source

Preparations used in practice are as follows:

1. Inj Iletin–L 40 IV/ml 10 ml vial (Eli Lilly).
2. Inj Insulatard 40 IV/ml vial (Knott).
3. Inj Lertisulin–HPI 10 ml vial (Cadila).
4. Inj Rapimax

(Dusified porcine 30% + Isophan 70%) (Sarabhai)

Insulin Human Source

1. Inj Humar Prodica 4.0/ml 10 ml vial(Knott).
2. Inj Humar Prodica 4.0/ml 10 ml vial (Sarabhai).
3. Inj Humar Zinulin with zinc Surplus 4.0/ml vial (Sarabhai).
4. Inj Insuman 25/75 ml 10 ml vial (Aventis).
5. Inj Insuman 50/50 ml 10 ml vial (Aventis).

Depot insulin such as PZ 9 (Protamin Zinc Insulin)(IZS) (Ulternate) Insulin Zinc Suspension; IZS (Lente) is globin insulin, Isophane (NPH) insulins highly purified depot insulin (Leo Retard).

Choice of Treatment and Policy of Treatment

1. All patients below 40 years requires injection of insulin, soluble insulin in the morning and depot in the evening.
2. Patient above the age of 40 years, diet and if not adequately oral hypoglycemia sulphonyeurea, and biguanide if patient is obese.
3. For elderly small doses of (20 units) depo insulin is considered to be enough.

Complications of Diabetes

1. Diabetic ketoacidosis and coma.
2. Diabetic nephropathy.
3. Diabetic ratinopathy.
4. Cataract.
5. Infections, acute and chronic
6. Diabetic neuropathy.
7. Diabetes in pregnancy.
8. Hypoglycemic reaction.

Diabetic Ketoacidosis and Coma

It is a serious and almost fatal complication in poorly controlled diabetes. If promptly and properly controlled, the patient can be out of danger within 24 hours. If treated, it is necessary to have clear insight in the pathogenetic process behind the condition.

First the microangiopathy in diabetes causes thickening of basement membrane of capillaries, increasing the permeability and causing water and mineral depletion.

Secondly, metabolism of fatty acids in liver produces acetone bodies usually oxidized. But if produced in excess they remain in the circulation and they may raise the osmolality of plasma which withdraws the intracellular fluid andcause disturbances of sodium and potassium ratio and also rise in pH and PCO_2 which stimulates pulmonary ventilation and thus there is acidosis, dehydration, and air hunger. The presenting syndrome of ketoacidosis ultimately leads to diabetic coma.

Clinical Features

The precipitating factors are acute infections, stress, poor control of diabetes. There is intense thirst and polyurea, constipation, cramps, blurred vision, abdominal pain, weakness, drowsiness which ultimately leads to coma.

Tongue is dry, eyeballs shrunken; air hunger, restlessness, deep sighing respiration, weak pulse, hypotension and smell of acetone can be made out.

Lab Test

1. Blood sugar level immediately and repeatedly.
2. Urine for sugar and acetone every specimen of urine to be examined until the patient is out of danger.

Treatment

Urgent emergency treatment is needed with satisfactory general management and nursing.

1. IV infusion with vitamins and small amount of insulin (5 units).
2. Injection of crystalline insulin 10 to 15 units SC and repeat after intervals and after fresh report of BSL.

3. Injection of suitable antibiotics IV
4. Glucose solution by mouth after regaining the consciousness.

Diabetic Nephropathy

Thickening of basement membrane of glomerular capillaries, i.e. microangiopathy and there is proteinurea causing ultimately nephrotic syndrome, renal failure and uremia. No other treatment than regular hemodialysis or renal implant in suitable cases are useful.

Diabetic Retinopathy

It is a long-term complication and one of the commonest cause of blindness. In the fundus the capillaries are actually visible and give first hand information of their condition. The microaneurysms are seen. They look circular discreet red dots. Tiny hemorrhages are seen. The venous abnormalities are seen. They are dilated irregular and tortuous. Soft exudates seen. Hard exudates are specific in diabetic retinopathy. They are irregular but sharply defined some times there is a detachment of retina.

Cataract

Very rarely an opacity develops in lenses in poorly controlled diabetes causing visual loss gradually and then complete. It is surgically removable and sight is regained.

Infections

1. Carbuncles is the pyococcal skin infection, appearance is typical and is due to poor control of diabetes. Adequate insulin and suitable antibiotic cures the lesion.
2. Pulmonary TB there is anorexia, loss of weight increase in insulin requirement and other signs and symptoms of pulmonary TB. The infection can be well controlled by anti TB drugs and increased dose of insulin. X-ray chest and sputum exam for acid-fast oraganisms to be done and also culture and sensibility test is helpful for following the correct anti-TB, treatment.
3. Pyelonephritis, vaginitis, pruritius vulvar, balanitis require adequate increased insulin dose and antibiotics.

Diabetic Neuropathy

Motor, sensory and autonomic nerves get involved and produces symptoms, more common in elderly with long-standing diabetes. The microangiopathy causes degenerative disease of vasa-nervorum and the sysmptoms of weakness, wasting of muscles of lower limbs. There is pain confined to legs or feet worst at night. There is paresthesia and loss of ankle jerk, vibration sense is lost. Trophic ulcers develop which is painless disorganization of distal joints like Charcot joint; as seen in tabes dorsalis. The response to the treatment is poor. Due to involvement of autonomic nerves system. There is diarrhea, incontinence of urine, impotence and postural hypo tension and sweating. Peripheral neuropathy causes tingling and numbness.

Diabetic amyotrophy causes bilateral symmetrical wastage of quadriceps with pains with correction and control of diabetes the complete recovery is possible though quite late.

Mononeuropathy and isolated nerve palsies are not uncommon including in cranial nerves and in some carpo-tunnel syndrome is seen in wrists.

Diabetes in Pregnancy

In the insulin era, a woman can have a child under expert medical care.

The risks in the later stage of pregnancy should never be neglected as there may be excess amniotic fluid and a large baby may cause obstetric problems. The probability of stillbirth has to be kept in mind. Early pregnancy test helps to start rigid control of diabetes. The oral hypoglycemic drugs are tetrogenic. They are to be brought on insulin regime at the earliest phase of pregnancy to keep the patient under best diabetic control. The pregnancy vomiting requires to be controlled properly along with food fads, likes and dislikes urine sugar is less reliable index due to pregnancy glycosurea and due to

reduced renal thresh hold in pregnancy where excessive loss of carbohydrates requires an additional dietary supplement.

Supplement of liquids to have normal urine and folic acid to be provided for pregnancy anemia treatment in proper doses.

It is wise not to allow a full term baby and undue delivery between 36 and 38 weeks or cesarean section will be advisable and save both mother and baby and forego the obstetric risks. Thereafter the insulin requirement falls considerably. It is worth remembering that the urine of pregnant women contains other reducing substances which may misguide.

Diabetes and Surgery

The surgery even minor along with anesthesies causes metabolic stress which diabetic has to meet although it is temporary and short lived.

Care of treating clinician to be concentrated upon providing adequate nourishment and careful watch on acidosis.

All diabetics to be hospitalized three days before surgery for control of diabetes, BP, anemia and prophylactic antibiotic umbrella. Hypoglycemia may occur and watch to be kept to provide IV glucose during and after surgery as the patient is taken on table empty stomach. Avoid injection of insulin just before the surgery and postpone till the following day and give it after breakfast. Before and after surgery, blood sugar level to be estimated and kept in view for further IV glucose control. Recovery from anesthesia requires careful supervision and management.

Hypoglycemic reaction: It is very easy to treat, but a little difficult to diagnose promptly.

Predisposing Factors

1. Unpunctual heavy meals.
2. Unaccustomed exercise, exertion or games.
3. Patients should know the earliest symptoms such as restlessness, uneasiness, sweating, feeling of hunger and epigastric pain. He should have tablets of glucose in the pocket which he can swallow or sugarcane juice or sugar in fruit juice to prevent the attack.

If the patient is unable to swallow the attack of semi-consciousness prevails, IV glucose to be started immediately and promptly in the nearest hospital.

Prevention of Diabetes

1. Eating habits, lack of exercise, chronic alcoholism, lack of medical check-ups, ignorance and carelessness requires to be attended by and guided by the family doctor.

High risk groups of positive family history requires to be attended particularly to ensure general awareness.

Regular healths check-ups in the schools; colleges and annual complete health check-ups of adults will help to solve the problem of prevention of diabetes.

Skin Disorders Involving the Oral Cavity 13

INTRODUCTION

Skin and mucous membrane together is the largest visible organ of the body. It is truly said that it is the mirror of mind and body health.

It covers the internal body from environmental stress, strain and altered atmospheric conditions.

Scientifically its functions are very important and they are as follows:

1. It protects and defends the body from physical, chemical and immunilogical trauma.
2. Percepts heat, cold and touch and provides afferent information to promote adjusting involuntary mechanisms by brain.
3. It regulates body temperature.
4. It speaks emotional condition like happiness, laughter, anxiety, fear, pleasure and displeasure, surprise, neurodermatitis, etc. and hence it is called a mirror of the mind.
5. It can indicate many important internal diseases such as jaundice, pigmentation, rash, purpura, swellings, atrophy, infection, and wrinkling.
6. It indicates leprosy and venereal diseases, which are very important to diagnose or suspect.
7. It manifests occupational and allergic hazards.

No dental or medical practitioner or student can afford to neglect this section but should master it to keep behind the back of mind while examining the oral cavity and also skin all over the body carefully and think of correlation.

The skin contains two layers consisting of epidermis and corium, four appendages, hair, nails, sebaceous and sweat glands along with blood supply, lymphatic and Nerve supply. The corium is considered as a canvas cover of the body with fibrous framework containing blood vessels, nerves and muscles.

The epidermis has got five layers and it is a purely cellular structure without blood vessels or nerves and depends upon corium for nutrition.

DERMATOLOGIC SYSTEMIC DISEASES

1. Hereditary hypohydrotic ectodermal dysplasia.
2. Hereditary hemorrhagic telangiectasia. (Rendu-Osler-Weber disease)
3. Papillon-Lefévre syndrome.
4. Pachyonychia congenita (Jadassohn – Lewandowsky syndrome).
5. White sponge nevus.
6. Keratosis follicularis (Darier's disease)
7. Tuberous sclerosis.

8. Peutz-Jeghers syndrome.
9. Addison's disease + postmalarial pigmentation.
10. Melanotic macule.
11. Soft palate pigmentation (associated with pulmonary disease).
12. Oral melanoacanthoma.
13. Erythema migrans (geographic tongue, benign migratory glossitis, ectopic geographic tongue, migratory stomatitis).
14. Systemic sclerosis (Scleroderma).
15. CRST syndrome.
16. Lupus erythematosus.
17. Pemphigus vulgaris.
18. Lichen planus.
19. Erythema multiforme.
20. Epidermolysis bullosa.
21. Crohn's disease (Regional enteritis)
22. Pyostomatitis vegetans.
23. Acanthosis nigricans.
24. Amyloidosis.
25. Angioedema (Angioneurotic edema).

Hereditary Hypohydrotic Ectodermal Dysplasia (Fig. 13.1 and 13.2)

Fig. 13.1: See wrinkled pigmented face and hyperpigmentation around eyes and frontal bossing

It a genetic hereditary disorder characterized by defective formation of various extrodermal structures. The skin is soft and dry, with wrinkles and hyperpigmentation, often occurring around the eyes. There is reduction or absence of sweat glands and, therefore the patient can not tolerate heat. The scalp hair are sparse, fine, and blond with similar eyebrows, eyelashes and other body hair. There is often frontal bossing and depressed nasal bridge. Many patients have atopic disease.

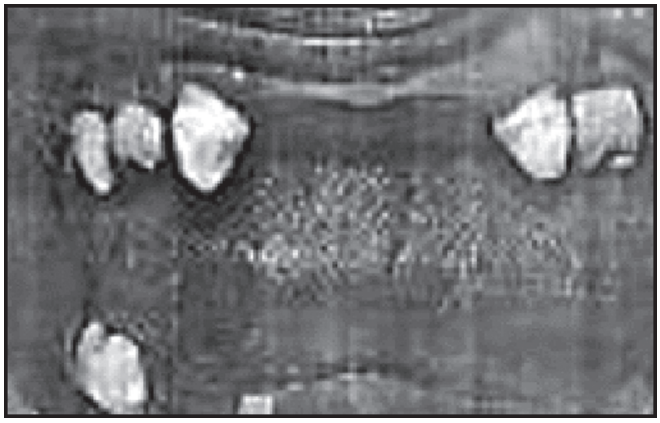


Fig. 13.2: Hypodontia leading to anodontia as seen in the figure. Teeth malformed and conical

The most characteristic oral findings are hypodontia or in some cases total anodontia. The teeth that have developed are typically malformed and conical in shape. The lips are often protuberant *and may exhibit pseudo orhagades or fissures*. The Hypoplasia of the mucoserous glands may lead to xerostomia and chronic rhinitis.

Hereditary Hemorrhagic Telangiectasia (Rendu-Osler-Weber Diseases)

It is a hereditary disease of vascular malformation transmitted as an autosomal diversant trait affecting both men and women. It is characterized by multiple vascular defects *causing hemorrhages in*

Fig. 13.3: Hemorrhage with the lips in the figure

oral cavity and throughout the body in the form of hemorrhagic episodes. Telangiectasis, arteriovenous malformations, and aneurysms. Weakness of the vascular walls and surrounding connecting tissues predispose patients to have hemorrhagic episodes such as epistasis. Cutanous hemorrhages and the oral lesions characteristically involving the lips and tongues (Fig. 13.3). Oral gastrointestinal and urogental bleeding may occur as well as hemoptysis and intracranial hemorrhages and which may be even the cause of death. Treatment is usually symptomatic.

Papillon-Lefévre Syndrome (Figs 13.4 and 13.5)

This syndrome is a rare recessive inherited condition characterized by Palmar and Plantar Hyperkeratosis and early periodontal bone destruction. The lesions become dry and fissured. *And acute periodontal involvement may be observed. The gingival become red, swollen and hemorrhagic, often with fowl odour the deep periodontal pocket are prudent. The primary teeth becomes mobile and exfoliate by the age of 16 the patient becomes teeth less except for the third molar which appears late. Once the permanent teeth have lost the alvoluler fissures comes to the normal and tolerate dentures well.*

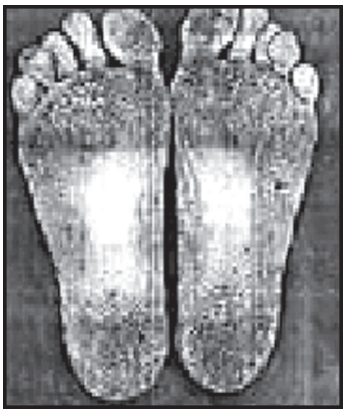


Fig. 13.4: Plantar hyperkeratosis as seen in the figure

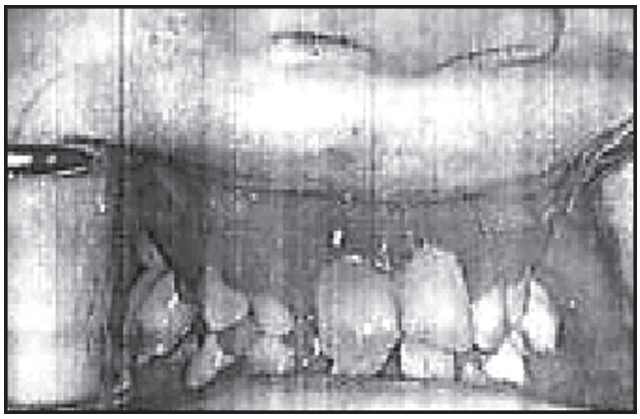


Fig. 13.5: Gingival swelling and hemorrhage are seen in the figure

Pachyonychia Congenita (Jadassohn-Lewandowsky Syndrome)

This is a rare genetic inherited syndrome, *starts shorly after birth and finger and toe nails become thick, elevated and tubular (Fig. 13.6). And project upwards and requires to be removed surgically. The hyperkeratosis of the palms and soles become painful and bullae may even burst and get secondarily infected (Fig. 13.7). The oral manifestations are hyperkeratotic lesions in the area of the dorsum of the tongue and buckle mucosa along with bite line.*

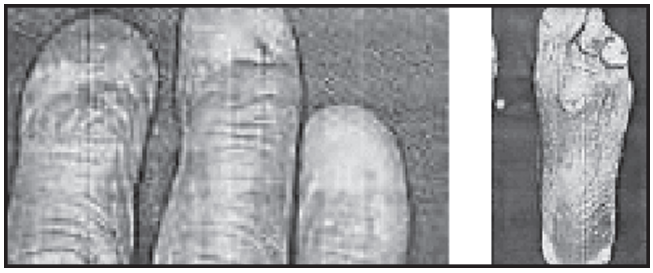


Fig. 13.6: Figures show thickness of nails, fingers and toes

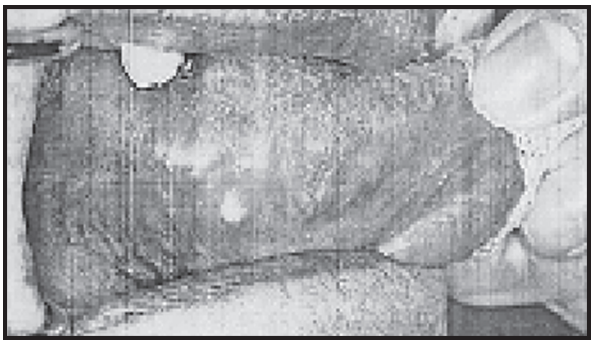


Fig. 13.7: Figure shows hyperkeratosis of palm

White Sponge Nevus (Fig. 13.8)

It is a rare abnormality of squamous epithelium, *Mucosa typically spongy white plaques and folds occur on buckle mucosa* and may also be seen on the oral side. The extraoral lesions may occur in vagina, labia, anorectal mucosa and nasal cavity. Biopsy is helpful in diagnosis.

Fig. 13.8: Figure shows red papules behind the ears

Keratosis Follicularis (Darier's Disease)

It is a rare inherited disorder which manifests during childhood and adolescence with the development of red to yellowish - brown papules behind the ears, around the nose and on the neck, chest, back and extremities. These popules become hyperkeratotic, crusty and gets secondary infection and produce an offensive odor (Figs 13.9 and 13.10).

Fig. 13.9: Figure shows red and brown papules on front of lower leg

Fig. 13.10: Figure shows the papules on the back are becomming hyperkeratotic crusty

The papules involves palms and soles and the patient feels difficulty in walking. The disease is worst in summer. *Oral involvement has been seen in 50 percent of the cases. Where rough gray white papule occurs on the hard palate*. No treatment is indicated for oral lesions.

Tuberous Sclerosis

This is discussed before elsewhere in the book.

Peutz-Jeghers Syndrome (Fig. 13.11)

It is a rare autosomal dominant condition *characterized by mucocutaneous melanin pigmentation on labial mucosa*, multiple gastrointestinal polyps. The pigmentation is prominent on the labial mucosa and perioral skin. Similar lesions may occur around the eyes, nose and, hands and feet and intraorally. The intestinal polyps are most common in the small intestine causing abdominal pain and sometimes

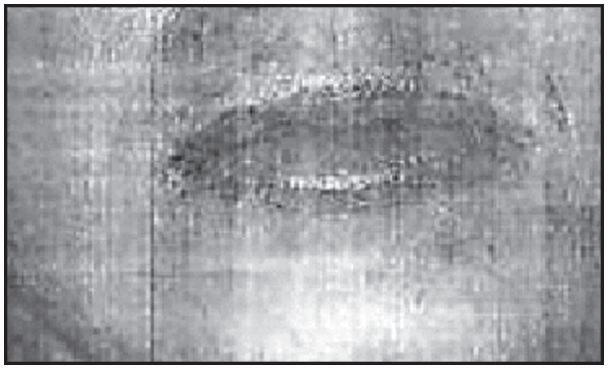


Fig. 13.11: Figure shows mucocutaneous pigmentation on lips

intussuseption. The patient is prone to gastrointestinal cancer, ovarian tumor and possibly pancreatic or breast cancer.

Addison's Disease + Postmalarial Pigmentation

Described before elsewhere in the book.

Melanotic Macule (Fig. 13.12)

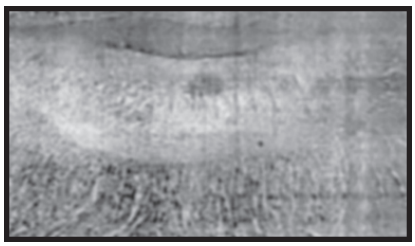


Fig. 13.12: Figure shows melanotic macule single on lower lip

These are a group of benign pigmented lesions of the oral cavity. The melanotic macule are typically well-circumscribed flat and may be brown, black blue or gray. Usually they are single lesions and only sometimes multiple. Common site is vermilion border of the lip. Usually in the mid portion of the lower lip. The gingival buckle mucosa and pallet are most common intraoral locations. Females are more commonly affected than males. The treatment is usually surgical excision.

Soft Palate Pigmentation (Associated with Pulmonary Disease)

This is usually seen in bronchial cancer. *These lesions are most common on lateral aspect of soft palate with bilateral distribution (Fig. 13.13).*

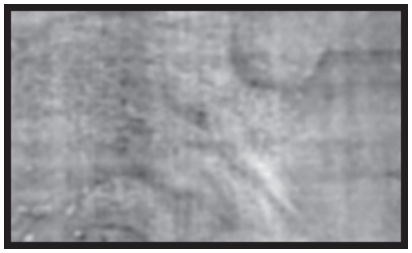


Fig. 13.13: Figure shows lesions on soft palate in both the side

Oral Melanoacanthoma

It is a rare pigmented lesion which occurs after local trauma. common in young adults. The buckle mucosa and palate are the most common locations (Fig. 13.14). The pigmentation often resolve spontaneously after involvement of irritating factor or incomplete excision.

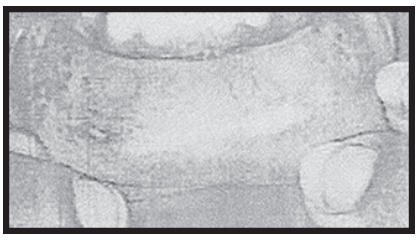


Fig. 13.14: Figure shows pigmentation on buckle mucosa

Erythema Migrans (Geographic Tongue, Benign Migratory Glossitis)

It is a common inflammatory condition and *usually affects the tongue which is called geographic tongue and also migratory glossitis (Fig. 13.15). The condition occurs in all ages and is more common in women.* The causes are unknown, most patients are symptom less but maybe sensitive to the spicy food. No treatment is indicated except symptomatic therapy.

Fig. 13.15: Figure shows geographic tongue

Systemic Sclerosis (Scleroderma)

Described in the part elsewhere in the book.

CRST Syndrome

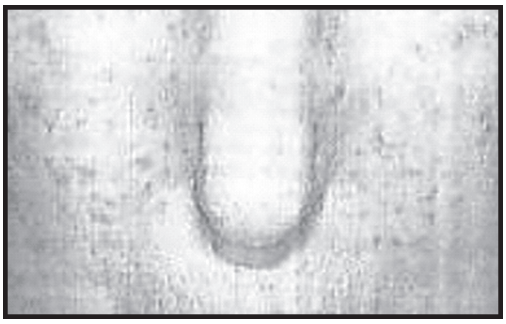


Fig. 13.16: Figure shows telangiectasis on face

It is a clinical variant of systemic sclerosis. It has got 5 major components. *Calcinosis cutis, Raynaud's phenomenon esophageal dysfunction, sclerodactaly, and telangiectasia. The telangiectasis is common on the face and lips and can be intraorally (Fig. 13.16). This syndrome is less severe than the systemic variety*.

Lupus Erythematosus

Described on before elsewhere in the book.

Pemphigus Vulgaris

Described on before elsewhere in the book.

Lichen Planus

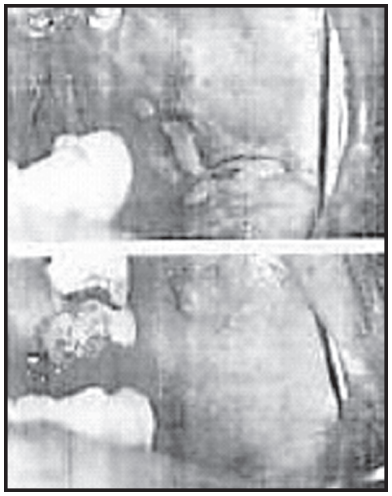


Fig. 13.17: Figure shows flat topped papules on ankle and lower leg

It is a relatively common inflammatory disorder of unknown cause *affecting the skin and oral cavity. Onset is in the middle age. Adults, females are more prone to it than the males*. There is a wide variation in the appearance and its prevalence. In patient seen primarily for the skin lesions which looks like flat topped polygonal papules with red and violet color specially on the lower legs and ankles (Fig. 13.17). The most common sites involved are the flexor surfaces of the ribs and legs and abdomen. *The oral lesions begin with a small white papule interlacing and known as Wickham's striae specially on the dorsum of the tongue. In a majority of the cases the buckle mucosa is involved*. It is a typically chronic condition which may exhibit exacerbations and remissions for many years. Biopsy is advisable. Some of them develop carcinomas, and, therefore, has to be kept under constant watch.

Erythema Multiforme (Fig. 13.18)

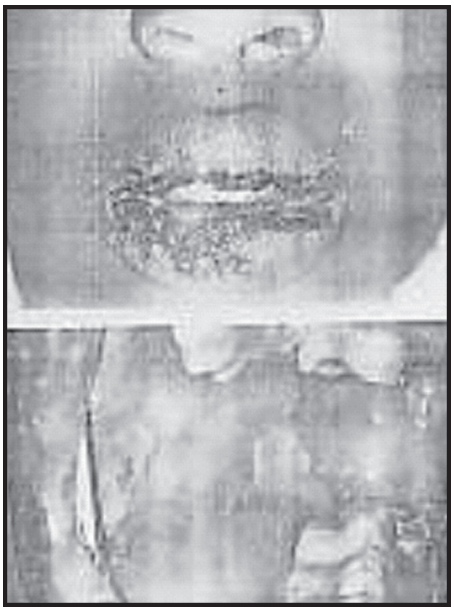


Fig. 13.18: Figure shows blister and necrotic lesions on face and legs

Acute inflammatory disease of skin and mucous membrane with a wide range of severity. Most commonly seen in young adults but older adults

can also be affected. Males can be affected more than females. Usually herpes simplex infection precedes sometimes it is considerable as a reaction to the drugs and antibiotic. It is followed by blister formation and necrotic lesions on the extensor surfaces of extremities. *Mucosal involvement in oral cavity is commonly seen and also on genitalia. The oral lesions are typical and there is a sudden onset and characterized by multiple painful ulcers which often cause difficulty in eating and may lead to dehydration and subnutrition*. Ocular involvement can be manifested by conjunctivitis, periorbital edema, and photophobia. And there could be permanent visual impairment. It is usually a self limiting disease, running variable courses. Recurrent episodes are not uncommon. The treatment consists of supportive care plus systemic steroid therapy. In more severe cases, hospitalization.

Epidermolysis Bullosa (Fig. 13.19)

Fig. 13.19: Figure shows bullous lesion in the oral cavity

In which blisters develop in areas of minor trauma. It is supposed to be a hereditary disorder. A wide range of severity is seen with extensive bullous lesion and usually Scarring occurs subsequently with deformities due to contractures *Intraorally enamel, hypoplasia has also been reported. The prognosis is usually fatal*. During the first few months of life, because of loss of fluid, sepsis, and dehydration. Less severe forms are usually compatible with normal life span.

Crohn's Disease (Regional Enteritis) (Fig. 13.20)

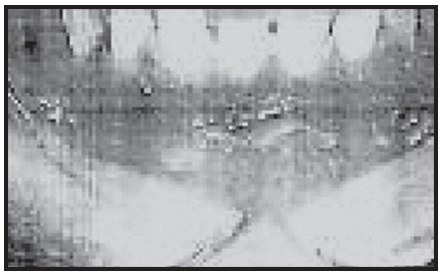


Fig. 13.20: Figure shows oral involvement in Crohn's disease

It is a chronic granulomatous inflammatory disorder which primarily affects small intestine. There is an intermittent diarrhea and abdominal pain and may result in severe malabsorption, fibrosis and development of fissures tracks. *The Oral involvement has been reported in 6 to 20 percent of cases and consists of non specific aphthous like ulcers and the buckle mucosa exhibit lobulated edematous, fissured appearance. Hyperplastic folds may develop in mucosal folds*. The treatment consists of systemic steroids, sulphasalazine or both. Surgical resuction may be necessary in some cases.

Pyostomatitis Vegetans

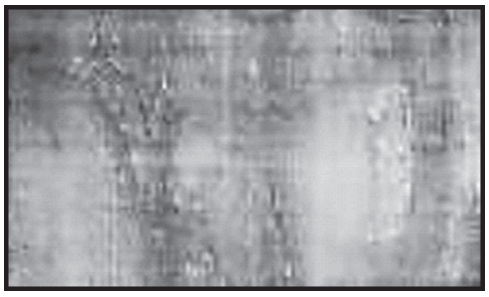


Fig. 13.21: Figure shows oral cavity with pustules giving snail track appearance

It is a rare inflammatory condition of the oral mucosa which exhibit a highly distinctive pattern. The mucosa is typically erythematous and edematous often exhibiting papillary folds and grooves that impart a somewhat pebbly appearance to the surface. Followed by multiple yellow pustules over the surface giving the "snail-track-appearance (Fig. 13.21)." Most patients have got ulcerative colitis or Crohn's disease. The oral lesions

often rapidly disappear with steroid therapy but may recur when treatment is stopped.

Acanthosis Nigricans

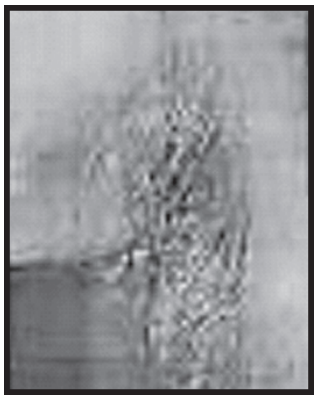


Fig. 13.22: Figure shows malignancy which is underlying

It is an uncommon dermatitis, which can be divided into malignant and benign forms (Fig. 13.22). In malignant, skin changes are the sign of underlying malignant disease usually gastric and other abdominal cancers. And the prognosis is poor. In case of benign the prognosis is not bad. *Though oral lesions in these variety do not exhibit hyperpigmentation*.

Amyloidosis

This has been well described elsewhere in the book.

Angioedema (Angioneurotic Edema) (Fig. 13.23)

It is an acute condition characterized by sudden rapid tissue swellings including lips. Two types are recognized:

1. Allergic
2. Hereditary.

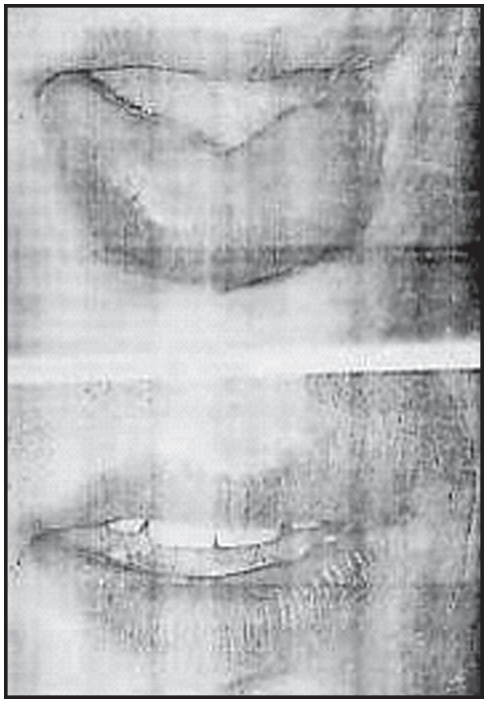


Fig. 13.23: Figures show oral swelling in case of angioneurotic edema

Both result into soft tissue swelling which can arise within a matters of minutes or hours. The lack of pain, heat, or erythema help to rule out the infectious process. If the larynx is involved the condition is life threatening and prompt tracheostomy will be needed. In the hereditary variety the attacks are frequent and awful receipted by trauma or stress. The allergic edema and its immediate hyper-sensitivity reaction is similar to urticaria except that it involves deeper tissues. Various drugs and foods are supposed to precipitate factors sometimes related to emotional stress, corticosteroids, antiallergic drugs and epinephrine are quite helpful.

Diseases of Connective Tissues, Bones and Joints (Rheumatology) 14

TYPES OF PRIMARY LESIONS

The disorders of connective tissues bones and joints are important parts of musculoskeletal system, which ensures free mobility in human beings. Primary lesions are:

a. Diffuse inflammatory.
b. Degenerative.
c. Hereditary.
d. Tumors.
e. Trauma, injury and fractures.

a. Diffuse Inflammatory

i. Rheumatoid arthritis.
ii. Ankylosing spondylitis.
iii. Systemic lupus erythematosus.
iv. Dermatomyositis.
v. Scleroderma.
vi. Polyarthritis.
vii. Polymyalgia rheumatica.
viii. Gout.

b. Degenerative

i. Osteoarthrosis.
ii. Intervertebral disc syndromes.
iii. Miscellaneous group.

c. Hereditary

i. Marfan's syndrome.

d. Tumors: Simple malignant and metastatic.
e. Trauma, injury: Due to accidents.

RHEUMATOID ARTHRITIS

It is a chronic polyarthritis mainly in peripheral joints of hands and feet recurring in long courses of remissions and excerebrations along with systemic disturbances. There is a swelling of synovial membranes and periarticular tissue, subchondral osteoporosis, erosion of articular cartilage and bone and wasting of associated skeletal muscles.

Its onset is insidious commonly at the age of forty years. It is about three times more common in females and its incidence is more common in temperate climate. It maybe due to a delayed response to exogenous, antigens or even to the autoimmune process.

It maybe precipitated due to emotion, anxiety and long continued overwork. The non-specific inflammatory processes causes swelling and congestion of synovial membrane and overlying connective tissues and subsequently with fibrous adhesions across the joints causing ankylosis resulting in muscles around getting atrophied.

Clinical Features

Initially the patient complains of arthralgia and muscular pains for weeks and months. Muscular weakness, fever and thereafter,

involvement of joints. The smaller joints of hands and feet are first to get affected, giving the appearance of spider hand. The disease progresses to the wrist, elbow, knees, hips, shoulders, sternoclavicular joints and the temporomandibular joints may occasionally get involved. The muscular stiffness worries the patient which is more severe in the morning. Disease advances and causes flexion deformities in the joints and there is an ulnar deviation of fingers. Subcutaneous nodules appear on elbows on patella on scapula sacrum and scalp and along the tendencies of fingers.

Subcutaneous nodules not uncommon on exterior surfaces of the forearm below the distal to the elbow, patella, sacrum, scalp and along the tendons of the fingers and of the toes.

Leg ulcer episcleritis keratoconjunctivitis sicca, pericarditis, plural effusion, peripheral neuropathy are the extra-articular manifestation of the rheumatoid arthritis.

It may co-exist in the coal mine workers with pneumoconiosis.

Appearance of amyloidosis is seen in severe cases.

Systemic signs and symptoms of this disease are low fever, tachycardia, anemia, mild leucocytosis, raised ESR, ultered plasma protein ratio and increase of globulin and fibrinogen, lymph adenopathy is seen.

X-ray shows demineralization and narrowing of joints space, a marginal erosion and spurs.

Investigations

Lab: CBC, ESR, total and differential serum proteins, CRP estimation, rheumatic factor (RF), IgG and IgM and tests along with VDRL for presence and also for presence of SLE. C-reactive proteins and HIV.

X-ray: X-ray of joints vertebral column and deformities.

Plan of treatment: Which consists of:

a. Local measures and physiotherapy, electrotherapy.
b. Anti-inflammatory NSAIDs drugs analgesics, corticoids and ACTH and muscle relaxants.
c. Gold salts rubifacients and topical analgesics.
d. Iron.
e. Surgery.
f. Rehabilitation.
g. Management of Juvenile Rheumatoid Arthritis.
h. Still's disease.

Aims of Treatment

1. Patients education.
2. To relieve the symptoms and anxiety symptomatically.
3. To prevent the progress of the disease.
4. To maintain the optimum joint function.
5. Modify the environmental and occupational factors to suit the needs of the patient within his limits.

The patients are to be fully educated about the course of disease its complications and limitations of treatment, create confidence in them and prepare them for willing co-operation for keeping the regularity in taking the drugs as prescribed and to do the specific exercises regularly and follow the physio and electrotherapy without fail. They should be taken for a trip to see the advanced cases in the specialized hospital so that they gets the firm idea and will to cooperate.

Anti-inflammatory, analgesic, muscle relaxant corticoid ACTH, rubifacients and topical analgesic are being described in detail.

Iron therapy is important for anemia and usually oral iron does not help and iron by inj IM should be given.

Gold therapy is now practically abandoned. The management of Still's disease where additional problems like adenopathy, splenomegaly, skin rashes are present. Joints swelling are to be faced better by keeping in a specialized hospital, looking into the needs of proper growth, schooling, mobility and under expert supervision for longer time.

Methods of treatment remaining the same as for adults with modified doses according to age and weight.

All patients cannot be accommodated in the hospital and they are to be sent home. Rehabilitation plan requires regular outdoor treatment and resuming suitable occupation under necessary care and limitations.

Drug Therapy in Rheumatoid Arthritis (NSAIDs)

Naproxen

Indications

i Osteoarthritis.
ii. Musculoskeletal disorders.
iii Rheumatoid arthritis IV soft tissue injuries.
v. Seronegative arthropathies.
vi. Pelvic inflammation.
vii. Cervical spondylitis.
viii. Dysmenorrhea.
ix. Tooth extraction.

Contraindications

Peptic ulcers, active GI bleeding

Dosage: Mild to moderate pain, menstrual cramps: 500 mg (starting dose),then 250 mg every 6 to 8 hr as required.

Muscular pain and arthritis: 500-1250 mg/daily
Gout: 750 mg (starting dose), then 250 mg every 8 hr until the attack as subsided.
Paed: > 2 years: 18 mg/kg/day-bd

Preparations used in practice

1. Artagen Tab (Ranbaxy).
2. Nalyxan Tab (Lyka).
3. Narryn Tab (Themis).

Mefenamic Acid

Indications

i. Osteoarthritis.
ii. Rheumatoid arthritis.
iii. Dysmenorrhea.
iv. Myalgia.
v. Dental and traumatic soft tissue pain.
vi. Pyrexia.

Contraindications

i. Hypersensitivity.
ii. Epilepsy.
iii. Glaucoma.
iv. GI bleeding.
v. Inflammatory bowel disease.
vi. Porphyria.

Dosages: Adults: 250-500 mg/tid children: over 6 months: 25 mg/kg/day in divided doses

Onset of Effect : 1 to 2 hr.

Adverse Effects: Indigestion, diarrhea, dizziness, drowsiness, nausea/vomiting, abdominal pain, rash, wheezing/breathlessness. Epigastric discomfort, hemolytic anemia, convulsion (in overdose).

Preparations used in practice

Dysmen 500 (Sigma)
Medol Forte (Blue Shield)
Ponstan (Parke Davos).

Nimesulide

Indications

Inflammation/pain/pyrexia

i. Rhematoid arthritis.
ii. Osteoarthritis.
iii. Low backache.
iv. Dysmenorrhea and other gynecological disorders.
v. Dental and postoperative pain.
vi. ENT inflammation.
vii. Trauma.
viii. Thrombophlebitis.

Contraindications

Active peptic ulcer, moderate to severe hepatic impairment.
Dosage: Adults:100 mg bd
Children: 5 mg/kg/day in 2 to 3 divided doses
Onset of Effect: 30 to 60 minutes

Duration of Action: 8 to 10 hr.
Adverse Effects: Pruritus, dizziness, somnolescence, headache, epigastric distress, heartburn, nausea, diarrhea, vomiting, skin rash.

Preparations used in practice
Anafebrin (Themis).
Emsulide (Emcure).
Nimegesic (Alembic).
Pronim (Unichem).

Diclofenac

Indications
i. Rheumatoid arthritis.
ii. Ankylosing spondylitis.
iii. Acute painful shoulder.
iv. Postoperative pain.
v. Musculoskeletal injuries.
vi. Dysmenorrhea.
vii. Sprain.
viii. Dislocation.
ix. Tenosynovitis.
x. Tendonitis.

Contraindications
Active peptic ulcer, GI bleeding, NASAID-induced allergic asthma.
Dosage: Adults 100, 150 mg/day in 2 to 3 divided doses.
Maint.:50 to 100 mg/day in div. doses by deep IM 75 mg once daily for max 2 days.
Children: 1 to 12 years 1 to 3 mg/kg/day in divided doses.
Onset of Effect: Around one hour (pain relief); complete anti-inflammatory effect may take 2 weeks.
Duration of Action: Up to 12 hr up to 24 hr (SR tablets).
Adverse Effects: Gastrointestinal disorders, headache/dizziness, drowsiness, swollen feet/ankles, rash, wheezing breathlessness, GI bleeding.

Preparations used in practice are as under:
1. Diclofen tab (Biochem).
2. Diclofenac sod 1.3 ml amp (Cadila Pharma G).
3. Diclomax tab (Torrent) and 3 ml inj
4. Diclonac (Lupin) tab and inj 20.3 ml, 10 × 15 ml vial, 10 × 10D tab.
5. Ontac tab (Elder).

Tenoxicam

Indications
i. Rheumatoid arthritis.
ii. Osteoarthritis.
iii. Gout.
iv. Shortterm treatment of soft tissue injuries.

Contraindications
NSAID induced allergy, active peptic ulcer or recurrent ulceration, GI bleeding, gastritis.
Dosage: 20 mg/day.
Onset of Effect: 1 to 2 hr.
Duration of Action: Up to 24 hr.
Adverse Effects: Edema, visual disturbances, blood dyscrasia, vomiting, nausea, epigastric distress, dyspepsia, skin rash headache.

Preparations used in practice are as follows:
1. Tobitil tab (Ranbaxy)

Ibuprofen

Indications
i. Osteoarthritis.
ii. Musculoskeletal disorders.
iii. Rheumatoid arthritis.
iv. Soft tissue injuries.
v. Seronegative arthropathies.
vi. Pelvic inflammation
vii. Cervical spondylitis
viii. Dysmenorrhea.
ix. Tooth extraction.

Contraindications
i. Peptic ulcer.
ii. High GI bleeding
iii. H/o hypersensitivity precipitated by aspirin or the NSAIDS

Dosage: Adults: 600 mg to 1.8 g daily (general pain relief) 1.2 to 2.4 g daily (arthritis) in divided doses.
Paed: Analgesic/antipyretic: 10 to 15 mg/kg dose every 4 to 6 hr. Not recommended in children under 7 kg.
Onset of Effect: Pain relief begins in 1 to 2 hr complete anti-inflammatory effect in arthritic conditions may not be felt for up to 2 weeks.
Adverse Effects: Nausea/vomiting, heartburn/indigestion, rash, wheezing/breathlessness, headache, vomiting, jaundice, GI intolerance.

Preparations used in practice are as follows:

1. Brufen (Knoll) 60 ml syrup.
2. Ibucon (Concept) tab.
3. Ibuflamar (Indoco) tab.
4. Ibugin (Glaxo) tab.
5. Combiflam (Russel (ibu 400 mg + para 325 mg tab) (ibu 100 mg + para 162.5 mg per 5 ml syrup).
6. Emflam plus (E Merck) (ibu 400 mg+ para 325 mg tab).
7. Ibugesic plus (Cipla) (ibu 200 mg + para 325 mg tab) (ibu 100 mg + para 162.5 mg per 5 ml - susp).

Meloxicam

Indications

i. Short-term symptomatic treatment of acute exacerbations of osteoarthrosis.
ii. Long-term symptomatic treatment of rheumatoid arthritis (chronic polyarthritis).

Contraindications

i. Hypersensitivity to meloxicam.
ii. active peptic ulcer (> 6 mon)
iii. Recurrent peptic ulcer
iv. severe hepatic failure
v. Gastrointestinal/cerebrovascular/other bleeding.

Dosage: Acute exacerbations of osteoarthritis : 7 mg/day. If necessary in the absence of improvement, the dose maybe increased to 15 mg/day.
Rheumatoid arthritis: 15 mg/day in elderly patients with rheumatic arthritis the recommended dose for long-term treatment is 7.5 mg/day.

Patients with increased risk for adverse reactions should start treatment with 7.5 mg/day. In dialysis patients with severe renal failure the dose should not exceed 7.5 mg/day. The total dose should not exceed 15 mg/day. The total daily amount should be taken as a single dose, with water or another liquid; during a meal.

Preparation used in practice is Muvera tab (Sun Pharma).

Flurbiprofen

Indications

i. Osteoarthritis.
ii. Musculoskeletal disorders.
iii. Rheumatoid arthritis.
iv. Soft tissue injuries.
v. Seronegative arthropathies.
vi. Pelvic inflammation.
vii. Cervical spondylitis.
viii. Dysmenorrhea.
ix. Tooth extraction.

Contraindications

Peptic ulcers, active GI bleeding, hypersensitivity.
Dosage: Adults :150 mg bd or 200 mg SR od. 150-200 mg/day in div dose.
Onset of Effect: 30 to 60 min.
Duration of Action: 8 to 12 hours.
Adverse Effects: Rarely thrombocytopenia, GI intolerenace, jaundice, rash, nausea, vomiting, Headache, fluid retention, peptic ulceration. Hemorrhage and perforation.

Preparations used in practice are as follows:

1. Arflur tab (FDC).
2. Flurofen tab (Hoechst).
3. Froben SR tab (Knoll).

Ketoprofen

Indications

i. Osteoarthritis.
ii. Musculoskeletal disorders.
iii. Rheumatoid arthritis.

iv. Soft tissue injuries.
v. Seronegative arthropathies.
vi. Pelvic inflammation.
vi. Cervical spondylitis.
vii. Dysmenorrhea.
viii. Tooth extraction.

Contraindications

i. Peptic ulcer, active GI bleeding.

Dosage: Adults 100 and 150 mg in divided doses Maximum 300 mg daily.
Onset of Effect: Within 30 min.
Duration of Action: 6 to 8 hr.
Adverse Effects: Thrombocytopenia, GI intolerance, jaundice, rash, nausea, vomiting, headache.

Preparations used in practice

1. Ostopen cap (Torrent).
2. Redupen tab (Unique).
3. Ketonal tab (PCI).

Phenylbutazone

Indications

i. Ankylosing spondylitis.
ii. Rheumatoid arthritis.
iii. Osteoarthritis.
iv. Rheumatic fever.
v. Acute gout.
vi. Blunt injuries.
vii. Fractures.
viii. Tooth extraction.

Contraindications

i. Severe hepatic and renal diseases.
ii. Hypertension.
iii. CHF.
iv. Peptic ulcer, hypersensitivity.

Dosage: Adults 100, 200 mg in 2 to 3 divided doses
Onset of Effects: Pain relief maybe noticed after 2 hr. Full beneficial effect may not be felt for 3 to 4 days.
Duration of Actions: Some effects may last for 3 to 4 days.
Adverse Effects: Nausea, vomiting, abdominal pain, swollen feet/ankles, rash/bruising/mouth ulcers, fever/sore throat, wheezing breathlessness. Depression, neutropenia, hypothyroidism, urticaria, edema, a plastic anemia, diarrhea, epigastric distress, peptic ulcer.

Preparations used in practice are as follows:

1. Aristopyin tab (Aristo).
2. Parazolandin.

Oxyphenbutazone

Indications

Severe rheumatic disorders and other indications of phenyl butazone (less gastric irritation).

Contraindications

Hepatic renal disease, hypertension and CHF, peptic ulcer, hypersensitivity.
Dosage: Adults: 100 to 200 mg bid or tid
Onset of Effect: 1 to 2 hr.
Duration of Action: Some effects may last up to 2 days.
Overdose Mx: Emergent medication, hospitalization, emesis, gastric lavage. Activated charcoal general supportive and symptomatic treatment. Forced alkaline diuresis. Dialysis not helpful.
Special Precautions: May lead to sodium and water retention, hence must be used with caution in patients with cardiac insufficiency. Not to be used routinely for musculoskeletal pain.

Preparations used in practice are as follows:

1. Butacortindon tab (Indo Pharma).
2. Butadex tab (Cadila).
3. Flamox Forte (Glen Mark).

Indomethacin

Indications

i. Rheumatoid arthritis.
ii. Ankylosing spondylitis.
iii. Acute gout.
iv. Osteoarthritis.
v. Barter's syndrome.
vi. PDA in neonates

Contraindications

Hypersensitivity, active GI bleeding, asthma induced by aspirin, or other NSAIDs.

Dosage: 50 to 200 mg daily in divided doses with food

Paed: Maybe given in juvenile arthritis if clearly indicated. The dose is adjusted accordingly.

Neonates:PDA: 0.2 mg/kg/dose for 3 doses 12 hourly IV/oral.

Onset of Effect: Some analgesic effect maybe felt within 2 to 4 hr. Total anti-inflammatory effect may not be felt for up to 4 weeks.

Adverse Effects: Abdominal pain/indigestion, headache, dizziness lighteadedness, nausea/vomiting, diarrhea, drowsiness/depression, blurred vision, rash, wheezing breathlessness.

Preparations used in practice

1. Idicin cap (IDPL).
2. Microcid tab (Micro Lab).
3. Idicin P cap (IDPL).

Piroxicam

Indications

i. Ankylosing spondylitis.
ii. Rheumatoid arthritis.
iii. Osteoarthritis.
iv. Postoperative pain.
v. Acute gout.
vi. Dysmenorrhea.

Contraindications

i. Recurrent peptic ulcer, active peptic ulcer, NSAID induced allergies, hypersensitivity, bronchial asthma.

Dosage

Adults: Rheumatoid arthritis, ankylosing spondylitis.

Osteoarthritis : 20 mg od

Maintenance : 10-30 mg od

Acute musculoskeletal disorders : 40 mg od/bd for 7-14 days

Acute Gout: 40 mg od

Maint: 40 mg od/bd for 4 to 6 days

Child over 6 yr < 15 kg: 5 mg od, 15-25 kg 10 mg. od 26-45 kg 15 mg od.

Onset of Effect: Analgesia: 3 to 4 hr arthritis: full anti-inflammatory effect: 2 to 4 weeks. Gout: Over 4 to 5 days.

Adverse Effects: Edema, vomiting, nausea, heartburn, epigastric stress, tinitus, skin rash.

Preparations used in practice

1. Brexic Cap (Wockhardt).
2. Dolonex Cap (Pfizer).
3. Piricam (Alidac).
4. Pirox (Cipla).
5. Toldin (Torrent).

Auranofin (Gold)

Indications

Rheumatoid arthritis.

Contraindications

Sever blood dyscrasia, renal and hepatic dysfunction, hematological disorders, H/o infection, hepatitis (not to be administered to patients who have developed severe renal or hematological toxicity during a course of therapy), H/o exfoliative dermatitis, necrotizing enterocolitis, and Bone marrow aplasia, pulmonary fibrosis induced by gold therapy.

Dosage

Adults: 6 mg daily in two divided doses or a single dose for a minimum of 3 to 6 months. If the response is inadequate, increase to a maximum of 3 mg tid (total 9 mg).

Onset of Effect: Beneficial effects maybe felt only after 2 to 3 months.

Preparations used in practice are as follows:

Goldar tab (Cadila HC).

Herbal

Preparation used in practice

1. Artrex cap (Alembic).

Rubefacients and Topical Analgesics

1. Algipan Cream (John Wyeth).
2. Cofenac Gel (Protec).
3. Diclomax Gel (Torrent).
4. Dicomac Gel (Lupin).
5. Dolonex Gel (Pfizer).
6. Dolopar Gel (Microlab).
7. Medicreme Cream (Rallis).
8. Metacin Pain Balm (Themis).
9. Minicam Gel (Blue Cross).
10. Prox Gel (Cipla).
11. Relaxyl Gel (Franco Indian).
12. Relaxyl Ont. (Franco Indian).
13. Sensur Rrubefacient (Lyka).
14. Tromagesic Gel (Themis).

ANKYLOSING SPONDYLITIS

It is a progressive inflammatory arthritis of the spinal costovertebral joints between the ages of 20 to 40. More common in females.

ESR is high.There is a presence of low grade fever. The cause of the disease is unknown. The test for rheumatoid arthritis is negative. The histocompatibility antigen HLA–B 27 is found to be present in 90 percent of the patients. And, therefore, has got diagnostic value.

When the disease progresses the inter vertebral space disappears and the X-ray looks like a bamboo spine, which is also diagnostic.

Clinical Features

Onset is very slow. History of repeated attacks of backache. Early morning pain and stiffness are characteristic features. As the disease progresses the stiffness affects the whole spine and also the costovertebral joints giving rise to marked limitations of chest movement. The deformity of kyphosis is also seen the latex stages, which incapacitates the patient. Iritis occurs in about 25 to 30 percent cases.

In a few cases ankylosing spondylitis may occur with Crohn's disease or ulcerative colitis.

Treatment

1. Drug treatment is the same as rheumatoid arthritis.
2. Radiotherapy is a treatment of choice is useful when the response to the drug treatment is not satisfactory. Initially the results are excellent. (the complication of occurrence of radiotherapy is in the incidence of leukemia which should be kept in the back of the mind).
3. Physiotherapy exercises, electrotherapy, plaster casts are useful.
4. Surgery: spinal osteotomy may allow patient to regain reasonable posture.
5. Corticoids have proved quite useful in giving relief to the patient.

Prognosis

It is good if patient responds to drugs and radiotherapy along with orthopedic surgical treatment.

SYSTEMIC LUPUS ERYTHEMATOSUS (SLE)

This disorder is the result of immune reactions in which the vascularity causes lesions in many parts of the body, particularly in joints, skin, kidney, pleura, pericardium, endocardium, nervous system. Number of other factors precipitates the onset as well as exacerbations, which includes exposure to sunlight, administration of drugs reactions such as sulphonamides, penicillin, procainamide, isoniazid, anti-coagulants and occasionally contraceptives. The incidence of disease is considerably higher than was thought in the past. But due to the availability of the diagnostic immunological tests of SLE, the early and effective treatment is possible.

Clinical Features

It is a disease of young women. Age of onset is usually 20 to 40 years. It starts with fever, migratory arthralgia and erosive arthritis. *Rashes are common, particularly butterfly on the face.* Raynaud's

phenomenon with skin involvement, ulceration, alopecia. The splenomegaly, pleural effusion, pericarditis, endocarditis indicate the diffused nature of the disease. The urine contains albumin. There is anemia, leucocytopenia, thrombocytopenia and the ESR is very high. The renal involvement may progress amounting to renal failure, uremia and death.

Diagnosis

1. An antibody shows the anti-nuclear factor (ANF).
2. Demonstration of LE factor in the serum although this is not considered absolutely diagnostic test.

Treatment

Corticoids is the drug of choice and patients are given prednisolone 20 to 60 mg per day and gradually tapering to bring on the maintenance dose of 10 to 20 mg per day.

Other complications of the treatment are required to be kept in view because this is a long-term treatment.

DERMATOMYOSITIS

It is a rare disease where there is a focal neucrosis in the voluntary muscles preceded by inflammation and followed by fibrous tissues getting calcification afterwards.

There could be an acute and chronic phase.

In the acute phase, which is common in children, there is edema and tenderness, swelling, weakness of the limbs accompanied by fever, leucocytosis, and skin rashes. There is edema of the eyelids with characteristic heliotrop discoloration. Respiratory muscles maybe involved leading to fatal consequences. After the acute attack there could be a contracture due to fibrous tissue in the musculature.

Chronic dermatosytis which runs a prolonged course and especially involves the peripheral muscles. When skin is not involved it is called polymyositis. Electromyography is helpful. Both these phases respond very well to the corticoisteroid treatment. They can be maintained after relief on 10-20 mg of prednisolone. Improvement can be satisfactory if early treated.

SCLERODERMA

This is a collagen disease and the skin becomes swollen and dense and sclerotic giving rise to contractures and deformities of the joints.

The changes are most prominent in the hands and face.

Not only is the skin affected but also the disease is progressive affecting gastrointestinal tract lungs, myocardium and kidneys.

The blood vessels in the skin and viscera show marks of intimal thickening.

Intermittent infections, cardicac and renal failure are common causes of death.

On the whole treatment is unsatisfactory. The general treatment at our disposal is the help of physiotherapy exercises and electrotherapy because of the marked impairment of the circulation of the skin.

GOUT

Gout is an inborn error of purine metabolism. Resulting into an increased level of uric acid in the blood which gets deposited as urates in the joints and periarticular tissues and also in the extra-articular cartilages of ears (tophi) and an acute attack of gout is manifested as considerable pain, swelling usually first in metatarsophalangeal joints later in other joints as they get affected. We are discussing gout here because it is connected with locomotor system.

Etiology

Hereditary factor is traceable in near about 80 percent of the patients. Commonly this disorder is seen in women who are more than 40 years of age.

High purine diet can be a precipitating factor. Secondly, gout may occur as a complication of hematological disorders such as polycythemia vera leukemia and myelofibrosis. It maybe precipitated by certain drugs such as, thiazine and frusemide overindulgance of alcohol or idiosyncrasy to certain foots. Even injury, overexertion, intercurrent infection and surgical operation can precipitate an acute attack of gout.

Clinical Features

In acute form the metatarsophalangeal joint of the great toe is first affected in about 90 percent of the cases. The onset is sudden, the patient is commonly caught unawares. The synovectomy renders full relief and restores the functions. Establishment and replacement of orthoplastic procedures for the knee, hip and fingers joint are now coming up. *The orthopedic reconstruction of joints with satisfactory prostheses has considerably improved*. Initially there is a presence of fever, leucocytosis, high ESR. After a few days the pain decreases and the skin over the affected joints become scaly and itchy. In the early stages the disease attacks occur at longer intervals and in between the attacks the patient is free from symptoms.

The X-ray reveals no change in the affected joints even the plasma urate can become normal in between.

In the chronic form the pain and stiffness persist with deformity. The deposits of urates of a chalky consistency known as tophi appear in the pariarticular tissues and on the cartilage of ear. Excessive excretion of uric acid may cause calculous formation in the kidneys and attacks of renal colic is common. In the later stages hypertension, renal failure may complicate the picture but such progressed cases are rare to be seen now-a-days because of effective treatment of gout in the early stage.

Treatment

In an acute attack the analgesic such as phenyl butazone is a drug of choice 600 mg to 300 mg per day.

Corticosteroid maybe used in exceptional cases.

Colchicine is highly effective but causes vomiting and diarrhea.

Endomethacin is liable to cause severe headache and gastrointestinal symptoms.

Dietary restrictions are helpful specially in pregnancy and obesity. It is better to avoid alcoholic drinks and food rich in proteins such as fish, liver, kidneys, and brain, heart and meat. These substances should be avoided in the diet.

Surgical procedures are immensely helpful in bringing the patient to almost normality.

DEGENERATIVE DISORDERS OF CONNECTIVE TISSUE

Osteoarthrosis

It's a degenerative disease in which articular cartilage and formation of bony outgrowth at the edges of affective joints is seen. The conditions occur in elederly peoples of either sex but may appear at any age in particularly injured joints.

In fact it is an exaggeration of normal ageing process in the particular joints, which was injured in the past. Symptoms are more common in weight- bearing joints as those have to bear the excessive strain. Thus osteo in arthrosis of knee is quite common in laborers and obese people.

There is a patchy degeneration, splitting of the articular cartilage at the maximum point of weight bearing. There is an exposure of underlying bone which becomes denser and harder at the new bone is set and laid down at the edges of joints called osteophytes. *Bony ankylosis never occurs*.

The onset of the disease is gradual and slow the pain is at first intermittent and of aching type only but when the joint is in use due to movement and

renewal by rest due to loss of cartilage the movements gradually gets affected and limited. There maybe iffusion into the joints and crypts maybe felt on palpation or maybe even heard. Radiologically there is a characteristic loss of joint space and sclerosis of articular margins and osteophytes appear at the bony edge.

Treatment

The changes in the joint is irreversible but symptoms maybe alleviated by analgesic physiotherapy and intra-articular injections of corticoids. Physiotherapy, hydrotherapy and local electrotherapy does a lot of good.

Surgery, arthroplasty and joint replacement have also been used with great success.

INTRAVERTEBRAL DISC SYNDROMES

1. Cervical spondylosis.
2. Thorasic spondylosis.
3. Lumber spondylosis.

In all these conditions the intervertebral disc is prolapsed behind pressing the spinal cord and giving rise to various neurological manifestations including paralysis depending upon the pressure point and narrowing of vertebral canal.

The advanced surgical treatment of laminectomy gives total relief to the patient if arrangement for microscopic surgery in expert hands is available.

TUMORS

Simple malignant and metastatic can produce the symptoms depending on the site of their existence.

TRAUMA

Injury due to fractures and pathological fractures require surgical assistance of an expert specialist.

Essentials of Oncology 15

CANCER AND ITS TREATMENT

In the era of modern advancement of medical science, globally **about 50 percent of all cancers are curable, if diagnosed early and treated correctly in time.**

Thanks to the cooperative surgical ventures and modern cancer chemotherapy and radiotherapy the therapeutic outcome has broken the old concept that the cancer is incurable.

In the olden days, cancer was considered as a death warrant. Clinicians were afraid to reveal even a suspicion of it to the patients, which used to make them half dead.

Things have become now optimistic and this speciality is getting public recognition and acceptance and voluntary submission of the patients for even cumbersome and expensive investigations essentially required for diagnosis as well as planning of the treatment. They now understand the diagnostic and therapeutic risks by following the advice of the specialist whom they approach willingly.

Types of Curable Cancer

Following are the cancers completely curable.

1. All benign tumors.
2. Epithelioma.
3. Leukemia.
4. Lymphomas.
5. Wilms tumor.
6. Funig's sarcoma.
7. Testicular cancer.
8. Hodgkin's disease.

Few more curable by surgery plus cytotoxic chemotherapy which is usually used as a single agent chemotherapy, adjuvant chemotherapy or irradiation by deep rays by the specialist, facing the problems of toxicity aspect on one hand and planning the optimum effective dosage schedule on the other.

It has become obligatory nowadays on the part of practising clinicians and dentist to refer the patient to the cancer hospital with a note about his findings supporting his suspicion. So that they can carry out the proper investigations and plan the early treatment and execute it with the help of specialist oncologists.

Systemic Diseases Manifested in the Jaws and Orofacial Cavity 16

The systemic disease category involves a wide spectrum of lesions. Simply defined, it includes those lesions that affect the whole body. In order to impart some order and clarity, the diseases that affect teeth, jaws and/or the oral cavity are classified into the following eight categories, along with few having involvement of oral cavity.

ENDOCRINE DISORDERS

Affections on teeth jaws and oral cavity.

Thyroid Glands

a. Hyperthyroidism (Basedow's disease, Graves' disease, thyroticosis) exophthalmos periorbital edema.
b. Hypothyroidism (cretinism, myxedema)
   Puffy eyelids, thick lips and tongue, speech slow and husky. In cretinism broad flat nose, thick lips and large tongue protruding out, delayed dentition.
c. Goiter may give rise to obstructive symptoms more so.

When there is retrosternal extension, compression and deviation of trachea which leads to venous engorgement of head and neck.

Parathyroid Glands

a. Hyperparathyroidism (Renal calcinosis).
b. Hypoparathyroidism (Tetany).

Pituitary Gland

a. Hyperpituitarism (gigantism) (acromegaly).
   Size of lower jaw is increased, enlargement of tongue and lips, nose and ears.
b. Hypopituitarism (pituitary dwarfism, Simmonds' disease).

Adrenal Glands

a. Adrenal cortical hyper function (Cushing's disease, hyperaldosteronism).
b. Adrenal hypofunction (Addison's disease).
   Pigmentation of bucal mucous membrane and tongue.

Gonads

a. Hypergonadism.
   Presence of adenoma is usual and surgical excision can give complete cure. Non-development of secondary sex character. Cryptorchidism (undescended testis), impotence infertility, in girls amenorrhea undeveloped secondary sex character.
b. Hypogonadism.

Pancreas (Diabetes mellitus)

Oral cavity infection bleeding gum and resistant ulcers.

COMMON DEVELOPMENTAL DISORDERS OF BONE

Osteogenesis Imperfecta

1. The bones are fragile and osteoporotic, blue sclera, deafness, deformities of bone and joints, dental abnormalities.
2. "Handigolo's syndrome" characterized by dwarfism, spine hip, lense deformities, genu valgum, dental maldevelopment and early decay.
3. Engelmann's disease characterised by severe mental retardation, fits, prominent jaws, wide mouth, protruding teeth and tongue.
4. Treacher-Collins syndrome characterized by mandibular hypoplasia, cleft palate, malar hypoplasia, deafness and defective teeth.
5. Crozon's syndrome characterized by cranial synostosis bilateral exophthalmos, strabismus, parrot beaked nose, mendibular proganthesium, defective dentation and drooping of lower lip.

Metabolic Disorders

1. Vitamin D deficiency—rickets.
2. Hereditary vitamin D-dependent rickets type I.
3. Osteomalacia.
4. Chronic renal failure (renal osteodystrophy).
5. Congenital hypophosphatasia.

Hematologic Disorders and Infections

1. Acute lymphoblastic leukemia (juvenile leukemia).
2. Sickle cell anemia, intravascular hemoptysis, severe anemia.
3. Hemophilias and bleeding episodes even in oral cavity.
4. Cogenital syphilis deformed teeth.
5. Tuberculous ulcers in oral cavity resistant unless when treated with anti TB drugs.

Autoimmune Disorders

1. Sjögren's syndrome.
2. Behcet's syndrome.
3. Deletion syndrome (cri du chat syndrome).
4. Gonadal dysgenesis (Turner's syndrome).
5. Klinefelter's syndrome.

   (For above all disorders see chapter of "Syndromes").
6. Other disorders.
   a. Fibrous dysplasia of bone.
   b. Histiocytosis X
   c. Osteitis deformans (Paget's disease)
   d. Famillal polyposis (Gardner's syndrome).
   e. Caffey's syndrome (infantile cortical hyperostosis).
   f. Basal cell nevus syndrome (Gorlin's syndrome).
   g. Progressive systemic sclerosis (scleroderma)
   h. Multiple myeloma (See chapter on "Hematology").

   For above all disorders (See chapter on "Syndrome").
7. Drug related sideeffects (See the chapter on Oral Pathology).
   a. Tetracycline.
   b. Steroids.
   c. Fluorosis.

Temporomandibular Joint Disorders

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ANATOMY

The primary components of Temporomandibular joint (TMJ) are the mandibular condyle, the articular surfaces of the temporal bone, the articular disc and the joint capsule.

The disc is a dense fibrous plate. It separates joints into superior and inferior compartments. It absorbs shock during mastication. Central position is avascular and thin, while posterior portion is thick and vascular.

The joint capsule consists of fibrous tissue, which attaches to the periphery. Synovial membrane lines the capsule and lubricates the joint.

Sensory supply is from branches of the auriculotemporal nerve. Superficial temporal artery provides blood to the joint. Both joints move at a time. Opening, closing, protrusion and retraction are bilateral symmetrical movements. Lateral excursions are bilateral asymmetric movements.

ORAL PAINS

One should evaluate pain by asking the following questions:

- Is the pain sharp or dull and throbbing?
- Does the pain occur suddenly or certain activity causes it?
- Is the pain constant or periodic?
- Does the pain become worse at any part of day?
- What is the duration of pain, short or of long duration?

About the joint one should ask

- Does the TMJ click on opening or closing?
- Is there only limitation of movement?
- Are other joints also involved?

Differential Diagnosis Facial Pains

1. *Trigeminal neuralgia*

It is an extremely debilitating disorder involving areas innervated by the first, second and third division of trigeminal nerve. Pain is unilateral and of short duration. Pain may be elicited on smiling, shaving touching the trigger point. Even breeze of wind may lead to pain. Pain is severe and patient tries to save trigger point.

It occurs more frequently in females after the 5th decade of their life. Etiology is unknown but it maybe due to compression of trigeminal roots by blood vessels. Proliferative and degenerative change of myelin sheath of large fibers of trigeminal ganglion may cause it. Carbamazepine is the drug of choice.

Tegretol tab 200 mg I thrice a day is helpful.

Surgical treatment includes:

- Neurectomy
- Cryosurgery

- Ganglionectomy.
- Peripheral neurectomy

2. *Multiple Sclerosis*

This disease causes demyelination of nerves and pain is similar to trigeminal neuralgia. It generally develops near the age of 20 years of age. There is a problem in gait and vision.

3. *Temporal Arthritis*

The pain associated with temporal arteritis is a rare disorder occurring in older individuals. Pain is intense which becomes worse on steepping or lying down. Pain is localized to the temporal, ear and facial areas. Elevated nodular arteries may be noted. WBC count and ESR are raised. Visual defects are common.

4. *Migraine Headache*

It is a common disorder involving arterial dilatation of the extracranial arteries generally at a time of anxiety and stress. Pain is unilateral; severe and throbbing in eye area. It may last from hours to years. Before actual attack one may have visual disturbances and numbness followed by tingling of lips and tongue.

5. *Angina Pectoris*

It is caused by disease of the coronary arteries. Due to atherosclerosis arteries become narrow resulting in decreased blood flow and oxygenation to the myocardium. This ischemia causes pain, which radiates to arm and lower jaw.

6. *Dental Disorders*

Facial pain of dental etiology is extremely variable. It may range from dullache to excruciating pain which may be intermittent or continuous. It may develop after mastication, percussion or on exposure to hot, cold or air. X-ray films may be helpful in diagnosis.

7. *Salivary Disorders*

Pain due to disorders of salivary gland maybe localized to the gland. Pain may radiate from ear to neck. If pain is during eating stone may be in salivary duct. Radiograph is helpful in detecting stone along with palpation.

8. *ENT Problems*

Inflammation and infection of ear must be considered when pain is localized in that car. Pain in maxillary and frontal region may be due to sinusitis. Sinus headache occurs most frequently in morning hours.

9. *Psychogenic Disorders*

There is atypical facial pain, which does not follow definite nerve distribution. Such persons maybe in depression or may suffer from overwhelming anxiety Antidepressants and psychogenic counseling may prove helpful.

10. *Myofascial Pain of Muscles of Mastication*

It is a pain referred from a localized tender area, a trigger point area, and a taut skeletal muscle. The head, neck, shoulders and lower back are the common sites involved. Pain may result from acute injury but more frequently as a consequence of overuse and may be chronic.

- Tenderness of one or more muscles
- Limitation or deviation of mandible on opening mouth
- Unilateral, dull pain in ear. Pain is worse on awakening.

The muscles involved are lateral pterygoid and masseter muscles. Myositis may precipitate the pain, and dysfunction. Irregularities in occlusion appear -to initiate the disease. Certain types of malocclusion restrict the movements of mandible.

Treatment

- As regards the treatment of emotional and physical disorder, there should be a strong doctor patient relationship
- Fluoromethane refrigerant spray can be applied to skin over muscles. Cold and hot packs applied thrice daily may prove helpful.
- Infection of trigger points of muscles in spasm with a local anesthetic containing xylocain.
- Soft diet
- Nonsteroidal anti-inflammatory drugs are useful
- Diazepam 2 mg at bedtime.

LOCAL CAUSES OF FACIAL PAIN

1. Oral or perioral lesions, or diseases of the nose, sinuses, eye, ear or neck.
2. Psychogenic causes.
3. The mouth: The oral causes of facial pain such as pulpitis and apical periodontitis, periodontal abscesses, pericoronitis and various intraoseous lesions are fully discussed in other texts.

INTRACAPSULAR DISORDERS OF TEMPOROMANDIBULAR JOINT

Degenerative Joint Disease

It is a non-inflammatory process involving deterioration of the articular soft tissues and remodelling of underlying bone. It leads to sclerosis of underlying bone, subcondylar cysts and osteophytes formation. Actually it is a response of the joint to chronic microtrauma.

Primary degenerative joint disease is of unknown origin and genetic roles are there. It is often asymptomatic while in secondary, underlying cause is trauma.

X-ray may not be very useful in early stage because soft tissues are involved. These soft tissues can be visualized with MRI or CT scans.

Clinical symptoms include unilateral pain directly over condyle, feeling of stiffness after a period of inactivity. Examination reveals tenderness and crepitus. X-rays shows narrowing of the joint space, irregular joint space, flattening of articular surface and osteophyte formation. These changes are best seen on tomograms and CT scan.

Conservative therapy includes nonsteroidal anti-inflammatory medication. An arthroplasty limits surgery to remove osteophytes and erosive areas.

Disc Prolapse

Any trauma due to acute force or chronic microtrauma frequently drives the condyle in posterosuperior direction and stretches the posterior attachment of the articular disc. This often results in anterior or anteromedial displacement of disc. MW helps in diagnosis.

Clicking of the temporomandibular joint (TMJ) is most commonly associated with anteriorly displaced disc with reduction on mandibular opening.

Clicking During Opening and Dosing

It occurs when a sound is produced as the condyle slips off the disc back onto the retrodiscal tissues. Pain may or may not be associated.

Painless TMJ

Clicking with minimal dysfunction usually does not need to be treated. For patients with chronic - habits of nocturnal clenching, a hard acrylic full-coverage splint helps to unload the joint and may prevent further disc displacement.

Painful Clicking of the TMJ

Usually can be successfully treated without surgery. Conservative treatment relieves pain but clicking persists.

Anthroscopic surgery of the superior joint space has proven to be successful.

In the treatment of anterior disc displacement with and without reduction.

Splints and physical therapy are used postoperatively when pain and dysfunction with disc displacement are severe and not alleviated by non-surgical therapy.

Rheumatoid Arthritis (RA)

Temporomandibular joint is bilaterally involved in RA. There is limitation of mandibular opening and joint pain. Pain is more in early stage and not in later stage. Other symptoms include morning stiffness, joint sounds, tenderness and swelling over joint area.

There is pain on palpation. Crepitus may also be evident. Ankylosis is rare. X-ray demonstrates narrow joint space, destructive lesion of condyle and its limited movements. There is marginal proliferation. High resolution CT of RA will show erosions of condyle.

Treatment includes anti-inflammatory drugs. In severe pain intra-articular cortisone maybe given. In severe cases and in those not responding to treatment placement of prosthetic joint is indicated.

Septic Arthritis

It is a bloodborne bacterial infection or by extension of infection from nearby maybe due to trauma. Measles and influenza also involve the joint.

There is severe pain on movement. There may be redness an d swelling in the region of joints involved. Large swollen lymph glands are seen and is a distinguishing feature from other diseases.

Lately serious sequelae include ankylosis and facial asymmetry.

Treatment includes surgical drainage and antibiotics.

Ulceration of Tongue

The mobility of tongue and its closeness, to teeth may result in physical trauma. The fimbricated folds on either side of the lingual foramen are the places to be affected by ulceration and ecchymosis. Shallow but persistent ventral surfaces are common with lichen planus, nutritional deficiency and hematologic problems. Xerostomia results in depapillation and atrophic lesions. Lack of protective lubrication and atrophic mucosa results in it.

Severe Episodes of Recurrent Aphthous Ulcers

Sudden biting trauma causes severe lacerations. Special tongue depressing splints that remove the tongue from the occlusal table are sometimes needed.

In chronic granulomatous infections ulcerative and proliferative lesions may develop.

Tuberculosis of tongue results in ulcer over posterior ventral surface or pharyngeal surface. Anterior third of tongue may be the site of extragenital chancre. Mucous patch of secondary syphilis may involve the tongue and other parts of oral mucosa.

In primary herpes simplex gingivo-stomatitis, the dorsum, ventral surface and lateral margins of the tongue maybe ulcerated. Herpes zoster may result in ulcer on one side of anterior third of tougue.

Lesions of acute necrotizing ulcerative gingivitis may spread to marginal surface of tongue producing necrotic defects.

DISEASES OF BODY OF TONGUE

Amyloidosis

In it an amorphous material with typical staining properties is deposited extracellularly either in one or many organs. Deposit may be heterogeneous.

Tongue in this disease is unusually enlarged, the site of nodular deposits or clinically unaffected.

Special stains congo red, crystal violet and use of polarising microscopy and fluorescence microscopy following staining with thioflavin-T are needed to identify amyloid deposits in biopsies.

Infections

It maybe as a result of contaminated trauma. Ludwig's angina may not be a infection but is characterized by an undulated swelling of whole floor of the mouth.

Actinomyces is not uncommonly isolated from tongue abscesses specially where there are deep lacerations of the tongue mixed with fragments of tooth.

Localization and encystment of cestode and nematode parasites in the tongue muscles have been noted occasionally.

Neuromuscular Disorders

Dysphagia: Symptoms of oropharyngeal dysphagia include aspiration while swallowing, re-regurgitation of fluid into nose, pharyngeal pain on swallowing and inability to move of the tongue.

Dystonia: Is abnormally increased muscular, tone resulting in a fixed abnormal posture. Problem may be localized to a small group. It may develop due to, Ievodopa therapy for parkinsonism. Focal dystonias are often observed and symptoms are by voluntary motor activity, nervousness and emotional stress. With relaxation and sleep the dystonia temporarily subsides.

Dyskinesia: Refers to any repetitive uncontrolled muscular activity. Tardive dyskinesia involves head, jaw, tongue or lips. It may follow due to long-term usage of phenothiazines and antipsychotic drugs.

Fine tremors and fasciculations of tongue are known as vermicular movements'darting movements of tongue as fly catcher's tongue. Involuntary mouth and chewing movements of lips with constant lip tremors are known as rabbit syndrome.

When abnormal involuntary motor disorders involve tongue, burning sensations and, umatic tongue ulceration are noted.

Common Complications

Weakness of tongue can develop in polymyositis, multiple sclerosis and muscular dystrophy The tongue muscles are affected in tile progression of venous muscular dystrophies. In myotonic dystrophy oral, facial, neck and tongue muscles are commonly affected.

Brainstem lesion may lead to hypoglossal palsy. If bilateral, the tongue cannot be extended, if unilateral the tongue deviates to the unaffected side when extended.

Myasthenia gravis results in weakness and easy fatiguability affecting facial, oculomotor, laryngopharyngeal and respiratory muscles. Protrusive movements of the tongue may become weak, leading to posterior collapse of it with airway obstruction. It may result in dysphagia and regurgitation of food into mouth. There is a poor control of saliva.

Neck Tongue Syndrome

It is characterized with unilateral occipital pain with or without numbness. This is due to compression of the root of second cervical nerve.

Angioneurotic Edema

It is one of the acute anaphylactic reactions representing an immediate hypersensitive response allied to urticaria and asthma. There is a localized edema involving deeper layers of skin and subcutaneous tissue. If localized in mucosa of tongue, considerable swelling of tongue occurs. Antihistamine and sympathomimetic agents such as IM adrenaline provides symptomatic relief and are sometimes life saving. Recurrent episodes are controlled by antihistamines 50 to 75 mg daily.

Malignant Tumors of Tongue

Ninety percent are epidermoid carcinoma of tongue. Sarcomas are rare. Metastatic carcinomas of lung. Squamous cell carcinoma of tongue is frequent. It

is a disease of middle and later decades of life. Epidemiology is not clearly established but may be due to tobacco, alcohol and trauma. Tobacco is strongly related to the prevalence of leukoplakia. The prevalence of infection with *C. albicans* is increased in all intraoral epithelial disease and is more prevalent in oral malignant lesions than in non-malignant lesions

MEDICAL PROBLEMS IN OROFACIAL DENTISTRY

a. Psychiatric disorders.
b. Neuromuscular disorders.
c. Immunologic disorders.
d. Nurologic disorders.
e. Endocrine disorders.
f. Pregnancy lactation.
g. Management of patient's problems.

Psychiatric Disorders

Most common disorder is clinical depression. There is an alteration in mood, sadness, loneliness, apathy, and a negative self-image, feeling of guilt and blame, regressive activity such as desire to escape, hide, or die. Other vegetative changes are anorexia, i.e. loss of appetite, insomnia, i.e. loss of sleep and loss of libido. The changes in activity levels are tiredness and/or agitation .

Signs and symptoms of depression: Mood—sad, unhappy, blue, crying. Thought—pessimism, ideas of guilt, self-denigration, psychomotor retardation and agitation. Loss of interest and motivation. Decrease in efficiency and concentration, agitation.

Somatic Disorder

Loss of appetite, weight, concentration, poor sleep, ache and pains, menstrual cycle changes, loss of libido.

Anxiety features: Loss of self confidence, altered behavior. All these mental changes causes negligence in maintenance and management of the oral hyegine resulting into infectious and consequences.

Neuromuscular Disorders

These disorders includes Parkinson's disease Myasthenia gravis, trigeminal neuralgia, Friedreich's ataxia , hemiplegia, and Bell's palsy. All these disorders cause difficulty in mastication, swallowing and maintain the normal oral hygiene. Rigidity of the facial muscle is common. The loss of flexibility gives the patient an expression less or mask-like face. There is difficulty in chewing, swallowing and in drolling tremors of the tongue and mandible is also common. Making speech and eating is difficult. The patient has to be cared with expert nursing skills and by feeding into oral cavity.

In case of myasthenia gravis the problem is in the evening and therefore feeding must be finished much before asthenia starts. Patient requires the help of nursing care for maintenance of oral hygiene.

In case of Bell's palsy the chewing difficulty can be over come by liquid and soft diet with special assistance by the nursing staff. In case of trigeminal neuralgia the attack should be avoided as much as possible and again the type of diet with liquid, semi solid and soft to be administered after the dose of analgesies and treatment of the drugs.

Immunologic Disorders

These contain rheumatoid arthritis which is a generalized inflammatory disease of unknown etiology and occur mostly in the temperate climate and the highest incidences are in women near the age of 40 year. It is a type of degenerative joint disease. And so many factors are considered to be responsible for the precipitance of the disease. All joints can be involved including temporomandibular joint and cricoarytenoid joint of the feeding. The joint become swollen and warm to the touch. Muscles around are atrophied and the function of the joint is inversely affected. There are features fluctuating of remissions and exacerbations

in many patients. The treatment is symptomatic and corticoids are used as a last resource. The dental management is done by the expert nursing care.

Neurologic Disorders

As above are usually manifested by pains and headaches.

Causes of Fisher Pain and Headache

The causes of Fisher's pains and headaches are tabulated as below.

Local Causes

- Dental or oral disease
- Infections or tumors of paranasal sinuses and nasopharynx
- Neck lesions
- Ocular lesions.

Psychogenic Causes

- Tension headaches
- Atypical facial pain temporomandibular pain dysfunction syndrome.

Neurological Causes

- Trigeminal neuralgia
- Glossopharyngeal neuralgia
- Herpetic neuralgia
- Reader's neuralgia
- Intracranial disease.

Vascular Causes

- Migraine
- Migrainous neuralgia
- Temporal arteritis
- Other causes.

Referred Pain (e.g. heart or chest)

- Raised intracranial pressure
- Meningeal irritation.

Diseases of the Skull

- Medical diseases (e.g. severe hypertension)
- Trauma
- Drugs (e.g. vinca alkaloids, nitrites, dapsone, some analgesics).

PREGNANCY AND LACTATION IN CLINICAL DENTISTRY

Drugs Contraindicated and Alternative in Pregnancy

Analgesics

- Aspirin
- Mefenamic acid
- NSAIDs
- Dextropropoxyphene
- Pentazocine
- Diamorphine.

Antimicrobials

- Tetracyclines
- Fluconazole
- Aminoglycosides
- Co-trimoxazole
- Supenonamides
- Rifampicin
- Metronidazole
- Ganciclovir
- Premedication
- Long-acting benzodiazepines(e.g. diazepam)
- Opiods
- Anesthesia
- Barbiturates
- Prilocaine.

Others

- Retinoids
- Antidepresants
- Carbamazepine
- Corticosteroids
- Danazol

- Providone-iodine
- Thaildomide
- Colchicines

Pregnancy is a major event in any women's life and the dentist should be careful about the following conditions:

1. Diabetes (to be controlled with the help of diabetologists).
2. Cardiovascular diseases such as hypertension, mitral stenosis or volvular diseases, and myocardial infraction or history of heart attacks.
3. Renal conditions including urinary condition, calculi, etc.

DENTAL ASPECTS OF PREGNANCY

Apart from dental education program prenatal fluorides are not indicated, as there is a little evidence to benefits the fetus. Drugs may be teratogenic during treatment, therefore, to be avoided. General anesthesia and possible sedation with diazepam or midazolam are particular hazards and must be avoided.

Tongue Disorders 18

DISEASES OF TONGUE

Hypoglossia: It is a rare anomaly in which only a tiny nodule of tongue tissue develops from the copula of embryo.

Macroglossia: Increased size of he tongue, seen in gigantism, acromegaly, and in neurofibrositis.

Bald tongue: Maybe congenital, Vit. B-complex deficiency resulting into diminished pain and taste sensation.

Inflammatory glossitis: The tongue appears red, denuded, and painful.

Geographic tongue: Cause is obscure, there is a burning pain, responds to local anesthetics.

Hairy tongue: Tongue movements are restricted, painful, the elongated papillae give hairy appearance, usually coated with bacteria, and fungi. There is a history of use of antibiotics in large doses for a prolonged period.

Thrush: Various size of white flecks on the dorsum of tongue containing yeasts and pseudomycelia, usually due to prolonged use of corticoids.

Burns of tongue: Due to very hot food, it is hypersensitive and painful and the appearance is white and leathery.

The keratotic white lesions, nutritional deficiency malignancy and pigmentations is already dealt within the previous chapters.

PHYSICAL EXAMINATION OF TONGUE

Very important fully apply the technique of inspection, palpation, by (Testing sensory discrimination, muscle strength and range of movements/motions and softness of tissues).

Compulsorily examine the cranial nerves 7th, 9th, and 10th. Evaluate the craniofacial reflexes including blink, papillary to light, and jaw opening reflex. Palpation of head and neck muscles may reveal tender spots, and trigger points and enlarged glands and salivary caliculi.

INTRAORAL EXAMINATION

It includes inspection of mucosal surfaces, teeth, tongue and Pharynx. Teeth for cracks, caries, faulty restoration and percussion evoke pain of pulpitis, which can be further evaluated with temperature, electric pulp test.

The temperature and cold intolerance suggest dental pathology. The diagnostic local anesthetic blocks, differentiate from CNS and psychiatric problems, and vapor spray from the trigger points. And other pain disorders.

Chronic pains are associated with anxiety, depression, and insomnia to be treated

Simultaneously and symptomatically. the acetone and phentolamine tests maybe helpful to ascertain the sympathetic dysfunction.

Do not forget to test sensation of bitter, sour, sweet and salt and record it, the sensation may be deminished or absent, which are not uncommon in aged persons.

CRANIOFACIAL NEURALGIA

It is denoted by a sudden paroxysmal pain such as trigeminal neuralgia, glassopharyngeal occipital, or post-herpetic neuralgias.

CANCER OF TONGUE

Early biopsy diagnosis and surgical excision is necessary and may even be curative.

Chronic Orofacial Pain 19

Majority of patients of pain have an identifiable physical cause for their pain and its management is simple. But certain patients may go on having pain without an apparent physical abnormality.

Pain is an unpleasant sensory and emotional experience associated with actual and potential tissue damage? Pain is always subjective.

Many people report pain even in the absence of tissue damage or any pathological cause the pain in such cases may be due to psychological reasons.

TERMINOLOGY ABOUT PAIN

1. *Allodynia* is a pain arising due to stimulus that is usually painful.
2. *Hyperalgesia* is an increased response to a stimulus that is usually painful.
3. *Hyperesthesia* is an increased sensitivity to stimulus and does not imply a painful sensation but rather an augmented response to specific sensory mode.
4. *Hyperpathia* is a painful syndrome with increased reaction to stimulus and an increased threshold.
5. *Causalgia* is a syndrome of burning pain.
6. *Hypoesthesia* is a decreased sensitivity to stimulation.
7. *Hypoalgesia* is a case of hypoesthesia in which the pain response is diminished.
8. *Neuralgia* is a pain in the distribution of a nerve. Neuropathy is a disturbance in the function of the nerve.
9. *Paresthesia* is an abnormal sensation which may be evoked or may be spontaneous.
10. *Dysesthesia* is an abnormal sensation. Central pain is pain associated with lesion in CNS.

GLOSSOPHARYNGEAL NEURALGIA

Ninth nerve is rarely associated with paroxysmal pain. It is similar to trigeminal neuralgia but of lesser intensity. A trigger pain follows the distribution of the nerve, i.e. pharynx, posterior tongue, ear or infraclavicular area. Pain is triggered by chewing, talking or swallowing. The disease can be confused with temporomandibular disorders due to pain following jaw movement. It may be associated with trigeminal neuralgia. Application of topical anesthetic to the pharyngeal eliminates glossopharyngeal neuralgia and helps in differentiating it from other diseases.

The treatment to it is similar to that of trigeminal neuralgia with a response to tegretol and baclofen. Those not responding to drugs may be considered for intracranial or extracranial section or cranial nerve X, microvascular decompression in the posterior cranial rossa or more recently by percutaneous radio frequency thermocoagulation of the nerve at juglar foramen.

Occipital Neuralgia

It is a pain along the distribution of the sensory branches of the cervical plexus in neck and occipital region. It is usually unilateral. Causes include trauma, malignancy, infection or aneurysm involving the affected nerve. There is a tender spot below the nuchal line. Treatment includes blocking the nerve with local anesthetic, corticosteroid, neurolysis or avulsion.

ACUTE HERPES ZOSTER

Acute herpes zoster is a recurrent infection following an earlier chickenpox. The neurotrophic virus travels along the nerve. The eruption is restricted to one dermatome. There is usually prodormal pain before the actual vesicles.

High dose antiviral therapy in the acute phase improves the rate of healing and shortens the period of pain.

Acyclovir capsules 800 mg five times per day for 2 weeks helps the patient. Systemic corticosteroid upto 3 weeks reduces the incidence of post herpetic neuralgia. Prednisolone 60 mg daily of first week, 30 mg daily for second week and 15 mg daily during 3rd week is usually used.

Postherpetic Neuralgia

It is a persistent neuralgia that continues after the acute herpes zoster eruption has healed. There is no trigger zone. Short-term, high dose systemic corticosteroid and tricyclic antidepressant therapy often provides some degree of pain relief. A 90 percent cure rate can be expected in-patient treated within 3 months of acute zoster but this drops to 30 percent after 1 year.

LESIONS OF EAR, NOSE AND ORAL CAVITY

Maxillary sinusitis is often associated with pain in maxillary teeth, molar and zygomatic area of the face. Occasionally forehead and temple headache develops.

Frontal sinus pain may be referred to forehead, vertex and the area behind the eyes. While from ethmoids it can be referred to the area between and behind the eyes and to the frontal and temporal region.

In *sialoadenitis*, palpation of the salivary glands may reveal masses, tenderness and enlargement, X-ray and CT may reveal obstruction of a secretory duct.

VASCULAR PAIN AND HEADACHE

Vasogenic pain is often dull, throbbing or pressing and may be well localized or diffused. Common syndrome is migraine.

Migraine is a familial disorder. It generally develops below the age of 40. It may be with or without localized area.

Migraine with aura is associated with pre headache, visual disturbances, unilateral paraesthesia or numbness. There may be unilateral weakness. Headache starts within 60 minutes of aura.

Migraine without aura is characterized by moderate to severe unilateral, pulsating pain usually behind the eye or in temporal region lasting for 2 to 3 days. Such pain increases with physical activity or visual/auditory stimulation.

Cluster headache is a unilateral headache with a sudden onset and no aura. There may be conjunctival reddening, lacrimation and nasal stiffness. It develops in men between the age of 20 to 50 years. The headache occurs in clusters lasting for 6 weeks. These patients are usually

excited. Alcohol or smoking may trigger the headache.

Tension headache is a common type of headache. The pain is bilateral, deep and often band like from occipital to frontal and often worsens as the day progresses. It can be chronic or episodic.

Etiology: There is no immediate accepted theory to explain the cause or pathology, trigeminal innervation of large cerebral blood vessels provides the substrate for intracranial pain sensation.

Headaches can be treated with vasoconstrictors and ergot alkaloids, beta blockers, calciumchannel blocking and other analgesic drugs.

Other Causes of the Neck Pain

Traction headache: It is caused by displacement of pain sensitive. Intracranial blood vessels affections maybe main sign or raised intracranial pressure. The typical three symptoms include headache, vomiting and papilledema. Such headaches can be localized over the site of tumor.

If cranial arthritis, commonly temporal artery is involved. There is an inflammatory obstruction. Symptoms maybe unilateral or bilateral. There can be local tenderness. Symptoms include deep aching and occasional throbbing or burning sensation over the pulmonary artery and adenitis in the region of neck, mandible, maxilla of the face. ESR is raised. Biopsy may be confirmatory.

Congenital Anomalies in Clinical Practice 20

TYPES OF CONGENITAL ANOMALIES

1. Hare lip.
2. Cleft palate.
3. Absence of one or more teeth.
4. Supernumery teeth.
5. Superaeruption of teeth beyond occlusal plain.
6. Individual tooth may be abnormal, retarded eruption, slow (This could be even due to acquired causes such as hypopituitarism, hypothyroidism, rickets).
7. Fusion of two or more teeth shortened (germination) or submerged.
8. Malalignment of lower and upper jaw (malocclusion may be due to mandibulofacial dysostosis or maldevelopment of half of the face.
9. Cleidocranial dysostosis (Saintou's disease in which there is delayed closure of fontanels and cranial sutures, under-developed upper face and absence of clavicles).
10. Craniofacial dysostosis (Crouzon's disease which is as above but the clavicles are present).
11. Mandibulofacial dysostosis: "Treacher Collins syndrome", in which there is hypoplasia of facial bones specially of zygomas, abnormal external ears, and lower eyelids.
12. Macrognathia or agnathia (large or very small jaw, very rare).
13. Cleft tongue.
14. Fistula lip.
15. Double lip.
16. Macrochelia.
17. Macrostomia.
18. Macroglossia/aglossia (which can even be acquired in amyloidosis, cretinism, hyperpituitarism, himangiomas, lymphangiomas and neurofibromas of tongue.
19. Lingual thyroid.
20. Thyroglossal duct cyst.
21. Median rhomboid glossitis.
22. Mid-line fistula of tongue.
23. Fissured tongue.
24. Dermoid cyst.
25. Bronchial cyst—maybe at the side of neck or at the angel of mandible.
26. Congenital epulis (a growth from alveolar mucosa of maxilla or mandible.
27. Bifid uvula.

Many of these anomalies are treatable surgically with satisfactory results. Cretinism yields to thyroid replacement therapy. The out

look to be concentrated upon mainly to relieve the disability of the patients and to avoid the risks rather than cosmetic appearance about which patients and their relations are more particular and insistent specially when the patient is a female.

Absence of hair. Lanugo (fetal) hair only, present on scalp. Scanty eyebrows and eyelashes and wrinkled skin give an aged appearance to the face.

Fingernails and toenails may also be dystrophic. There is also deficiency in the lacrimal and salivary glands. The iris may be affected.

The defect affects males more frequently than females and is transmitted genetically through the mother. The growth of the maxillary and mandibular bases are entirely normal. Prosthesis should be constructed as soon as the child is able to cooperate, usually between 3 and 6 years of age. These children manage the prosthesis remarkably well inspite of the absence of an alveolar process due to the absence of teeth. Dentures produce a marked psychologic improvement in both the child and his parents and give the face a younger appearance. Since the denture bases increase only in length and not in width, the prostheses need to be replaced only at the following age periods to simulate changes in the natural dentition and to accommodate for increased length of the denture base: at 3 to 6 years (mixed dentition) at 15 years (young permanent dentition) and in adulthood, to simulate the older, worn dentition.

Ectodermal Dysplasia

Dentinogenesis Imperfecta

Hereditary opalescent dentin or dentinogenesis imperfecta, an autosomal dominant disorder produces abnormal dentin that is dull and bluish brown or opalescent and does not cushion the overlying enamel adequately. Such teeth cannot withstand occlusal or biting stresses and rapidly become worn. Congenitally narrow lateral incisors, often referred to as "peg shaped" laterals, are not associated with systemic disease.

Dentinogenesis imperfecta is the result of a dominant genetic defect, which affects both the deciduous and permanent dentitions. The teeth appear gray, amber, or brown translucent color and undergo a characteristically rapid and severe attrition as soon as they appear within the oral cavity. The third characteristic is the absence of pulp chambers and usually also, an absence of pulp canals.

The enamel appears to be normal both histologically and chemically but tends to chip away from the dentin and wears away with extraordinary rapidity. The dentino-enamel junctions are smooth and non-scalloped.

The dentin is imperfectly formed (dentinogenesis imperfecta). It is a tubular fibrous and highly irregular. A thin peripheral layer (the mantle dentin) is normally formed.

Pulp: The fibrous dentin is laid down continuously so that the pulpal outline as seen in the X-rays is abnormal even in the young child. The pulp chamber is soon obliterated and the pulp canal remains only as a thin slit or is also obliterated. In spite of the fibrous dentin and absence of pulp tissue, the sensitivity of these teeth varies from normal to decreased sensation.

The rapid attrition of these teeth soon results in a closed bite. Crowns should be placed on the deciduous and permanent molars as soon as they appear into the oral cavity. Even brief delays result in wearing of the enamel crown to the gingival line. Procure crowns should be placed on the anterior teeth as soon as the self-conscious child requests them. Preparations of the teeth for crowns are minimal due to the rapid wear.

Dentinogenesis imperfecta may occur alone or maybe associated with another mesodermal defect, osteogenesis imperfecta (brittle bone disease) and blue sclera. When the triad occurs together, the defects tend to be very severe and the condition is termed congenital mesodermal dysplasia. In view of this possible association, a history of bone fractures should always be sought in children with hereditary opalescent dentin.

SYNDROME IN DENTISTRY

These syndromes are nowadays considered out of fashion and less and less encouraged by all concerned. None are highlighting the syndromes in theory, clinical practice and in examinations.

Going deeply into this modern trend we feel our clinical acumen matters more than any thing else.

Our hats are off to the veteran clinicians of eminence who were observant to spot out precisely the cluster of positive findings and labeled as syndromes. Because of their incentive their names were given to the syndromes. Their eyes were trained to spot them out and follow them to the last.

Now we think that the reference of these syndromes is worthwhile in typical situation and if the candidate can mention them correctly at right situation he/she will be rewarded.

Congenital Genetic Disorders and Syndromes

The Classification under Inheritance Patterns

a. Dominent gene.
b. Autosomal recessive gene.
c. X-linked gene.
d. Polygenic.
e. Chromosomal.
f. Imprinted genes.

(a) Under Dominant Genetic Conditions

- Nurofibromatosis.
- Tuberous sclerosis.
- Marfan syndrome.
- Ehlers-Danlos syndrome.
- Grolin syndrome.
- Gardner syndrome
- Single central tooth.
- Treacher Collins syndrome.
- Apert CSCP syndrome.

(b) Under Auto-recessive Gene

- Sickle cell disease

(c) Under X-linked

- Mental retardation
- Ectodermal dysplasia

(d) Under Polygenic

- Cleft lip/palate

(e) Under Chromosomal

- Down syndrome
- Turner syndrome
- Klinefelter's syndrome

(f) Under Imprinted Genes

- Prader-Wiedemann syndrome
- Angelman's syndrome

The dentist is often in a unique position to pick up a previously un recognized genetic/birth defects in a patient or family. Most of the syndromes affect the oral structures in a unique way aiding the diagnosis.

Rare Syndromes

Following are the rare 43 syndromes discussed briefly:

1. Down syndrome
2. Williams' syndrome
3. Apert, Crouzon, Saethre-Chotzen and Pfeiffer's syndrome
4. Gorlin syndrome
5. Gardner syndrome
6. Treacher Collins syndrome
7. Sjögren's syndrome
8. Robin syndrome
9. Crouzon's syndrome
10. Marfan's syndrome
11. Ehlers-Danlos syndrome
12. Hurler's syndrome
13. Turner's syndrome
14. Klinefelter's syndrome
15. Prader-Willi's syndrome
16. Angelman's syndrome
17. Beckwith-Wiedemann syndrome
18. Lip-Pit syndrome
19. Peutz-Jeghers syndrome
20. Plummer-Vinson syndrome
21. Papillon-Lefévre syndrome

22. Crest syndrome
23. Pierre Robin syndrome
24. Apert's syndrome
25. Trisomy syndrome
26. Goldenhar's syndrome
27. Down's syndrome
28. Froy's syndrome
29. Eagle's syndrome
30. Branchio-oto-renal syndrome
31. Achondroplasia syndrome
32. Jadassohn-Lewandowsky syndrome
33. Tuberous sclerosis
34. Darier's disease
35. Crouzon disease
36. Klippel-Feil syndrome
37. Laurence-Moon-Biedl syndrome
38. Bonnevie-Ullrich syndrome
39. Heck's disease
40. Gorlin-Goltz syndrome
41. Caffey-Smith syndrome
42. Frey's syndrome
43. MPD syndrome

Down Syndrome (Fig. 20.1)

A congenial anomaly characterized by short stature, hypotonia, friendly good natural disposition, with other congenial cardiac defects, SBE, prominent deeply furrowed tongue, dysphasic enamel, high prevalence of periodontal disease malocclusions, flat nasal bridge, up slanting palpebral fissures, small ears simple palmer creases, short fingers and toes, with incurving fifth finger, (Clinodactyly) wide spacing between 1st and 2nd toes.

Williams' Syndrome (Fig. 20.2)

A genetically inherited disorder of unknown etiology characterized by retardation of growth, remarkably small body size with typical facials and behavior. Lips are prominent, mouth is wide. Periorbital fullness.

Fig. 20.1: Down syndrome facies

Fig. 20.2: Williams' syndrome

Apert, Crouzon, Saethre-Chotzen and Pfeiffer's Syndrome (Fig. 20.3)

All these genetically inherited disorders Characterized by moderate mental retardation, craniofacial synostosis, prominent eyes, hypertelorism, small beaked nose, high palate, crowding of teeth, maxillary hypoplasia, tall forehead and brachycephaly, maybe asymmetrical facial distortion.

If not surgically treated early in infancy. There is possibility of lose of vision and hearing. Apert's syndrome is usally associated with syndactyly of hands and feet.

Fig. 20.3: Apert's syndrome

Gorlin Syndrome (Fig. 20.4)

It is also called Basal-cell nevus syndrome. It is characterized by prominent eyes, forehead, and jaw. Occasionally coexisted with rib anomalies or/and benign tumors, Such as lipoma, fibroma, cysts of maxilla or mandible.

Fig. 20.4: Gorlin syndrome

Gardner Syndrome

It is familial polyposis and and may be first diagnosed by dentist noting the dentigerous cyst, supernumerary teeth, and delayed teeth eruptions, and osteomas of mandible or any other facial bones. The sebaceous cysts over trunk, face, or scalp are also seen. The prognosis is poor due to tendency of malignancy. A colectomy is recommended and may provide cure if all other tumors are surgically removed at the earliest.

Treacher Collins Syndrome (Fig. 20.5)

There is remarkable craniofacial appearance including marked mandibular hypoplasia, (microganthia), cleft palate, microstomia, malar hypoplasia, down slanting palpebral fissures pre - auricular tags, microstia, or external ear cannal defect, and deafness. There is coloboma or ectropion on the lower eyelid, producing a sagging of lower eyelid due to dominant in-heritance. There is limbs and bodydefects.

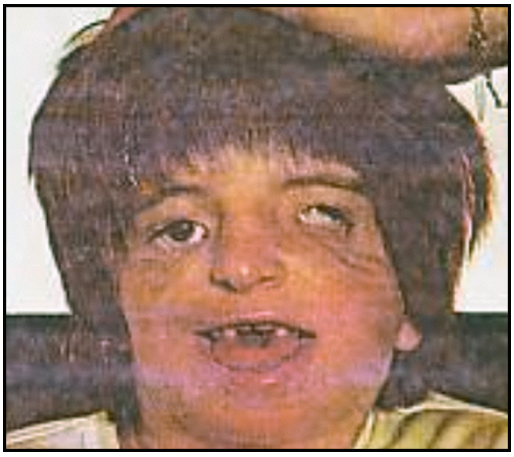


Fig. 20.5: Treachers-collin syndrome

Sjögren's Syndrome

It is an autoimmune disorder characterized by dry eyes, dry mouth, (xerostomia) may be accompanied with rheumatoid arthritis and and other organs such as lungs, liver, kidney, muscle, thyroid and segments of GI tract. Common in females, age 30 to 65 years and about 50 percent exhibit parotid swelling. There is extensive dental caries and the risk of malignant lymphoma must be kept in mind.

Robin Syndrom

It is observed at birth with aspiratory distress with cyanotic spell followed by pneumonia. Maybe due

to pressure of the chin of mandible on sternum during intrauterine malposition. The association of cleftpalate to be looked for.

Crouzon's Syndrome

A hereditary disorder characterized by cranial synostosis, bilateral exophthalmos, external strabismus, parrot-beaked nose, relative mandibular prognathism with drooping of lower lip.

The X-ray skull shows "copper beaten pattern" which is due to frequent remolding of the skull inner table of calvarium. The skull cannot expand due to premature fussion.

Marfan's Syndrome

It is autonomic in origin characterized by marked laxity of joints, lengthening of long bones leading to tall stature, sternal deformities, scoliosis, high narrow palate, dislocation of ophthalmic lens/severe myopia, often retinal detachment and the worst is aortic aneurysm and then dissection and sudden death.

Ehlers-Danlos Syndrome

In this there is marked laxity of joints, increase in height, and velvety soft skin, spontaneous bowel rupture of bowel or vascular. Although it is not uncommon. There is premature loss of teeth; In the new era the genetic engineering may be helpful.

Hurler's Syndrome (Fig. 20.6)

This is genetic in origin. There is mental retardation, coronal clouding, loss of vision, joint contractures and hepatomegaly, relative macrocephaly, fat bridge of nose. Incidence between the age of 10 to 30 years. The inguinal/umbilical hernias may be a problem. The surgery is hazardous and the medical is not fruitful, big lips, tongue, spaced teeth.

Fig. 20.6: Hurler's syndrome

Turner's Syndrome

A chromosomal disorder due loss of "X" chromosomes, loss of secondary sex character, some have coarctation of aorta, low hair line, webbing or short neck, narrow palate and micrognathia. Women are of small stature with incomplete/absent sexual changes, infertility and visual perception changes.

Klinefelter's Syndrome

A syndrome associated with tall lanky appearance, secondary sex character less developed, presence of gynecomastia in males, less intelligent mentally.

Prader-Willi's Syndrome

It is due to genetic abnormality, there is extreme opacity, hypotonia, plump, overweight, small hands and feet, red hair almond shaped eyes, enamel hypoplasia, dental caries prominent, abnomally long arms (Fig. 20.7).

Angelman's Syndrome

This disorder is of genetic origin, severe mental retardation, useless physical activity, and outburst of unprovoked laughter, fits, flatter mid-face, prominent jaw, wide mouth, protruding tongue.

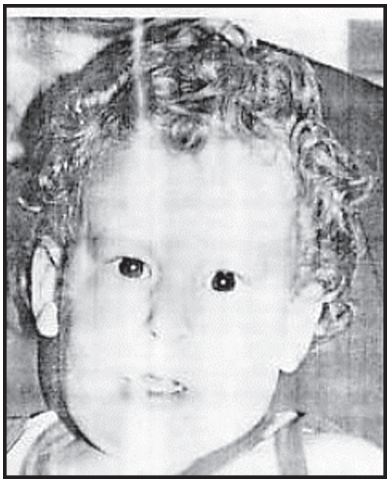


Fig. 20.7: Prader-Willi's syndrome

Beckwith-Wiedemann Syndrome

This abnormality is also genetic in origin. Orofacial alterations are striking. There is marked macroglossia causing delayed/altered primary and secondary dentaition. There is maxillary hypoplasia, prominent eyes, linear earlobe creases. There is macrostmia at birth and few show hemihypertrophy in chidhood. They are 10 to 12 percent have got incidence of Embryonic tumors. Such as Wilms' tumor of kidney, adenocortical CA, hepatoblastoma or gonadoblastoma for which keen watch requires to be kept (Fig. 20.8).

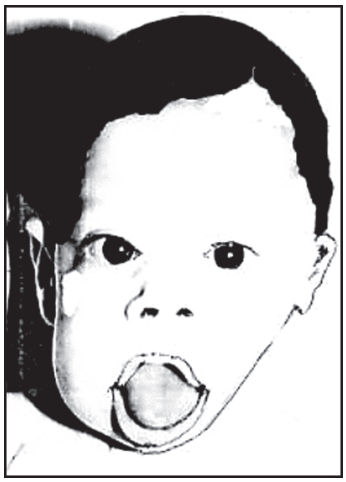


Fig. 20.8: Beckwith-Wiedemann syndrome

Lip-Pit Syndrome

Two congenital pits are located on either side of the midline of the lower lip in this infant with a repaired ceft palate. Abnormalities of the extremities have been noted in association with this syndrome (Fig. 20.9).

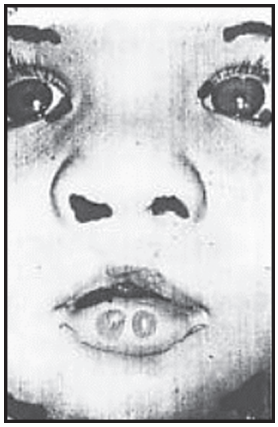


Fig. 20.9: Lip-Pit syndrome

Peutz-Jeghers Syndrome

This is a rare autosomal dominant condition characterized by multiple gastrointestinal polyps and mucocutaneous melanin pigmentation which are often congenital and commonly present on the labial mucosa and perioral skin round the oval macules color being light brown to blue-black. Similar lesions may occur around eyes, the nose, on the hands and feet, and intraorally polyposis is in small intestine causing intussusception and pain and tendency for CA of GA sys, ovarian, pancreatic and breast (Fig. 20.10).

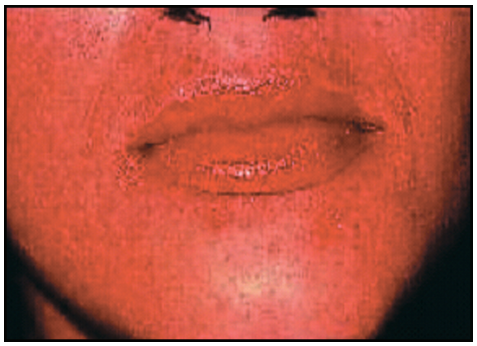


Fig. 20.10: Peutz-Jeghers syndrome

Plummer-Vinson Syndrome

This consists of iron-deficiency anemia, dysphagia,web structures at the upper part of esophagus is common in middle age women Palor of skin, atrophy of mucous membrane and tongue papillae making the appearance smooth, red. Painful glossitis and angular cheilitis is also seen. Significant incidence of CA of esophagus,oral cavity and hypopharynx is seen. (Fig. 20.11) (it is also called Paterson-Kelly syndrome; sideropnic syndrome).

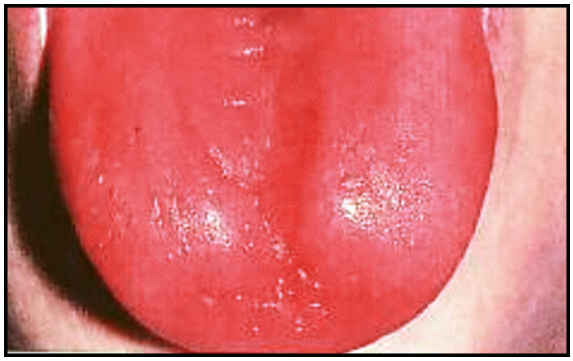
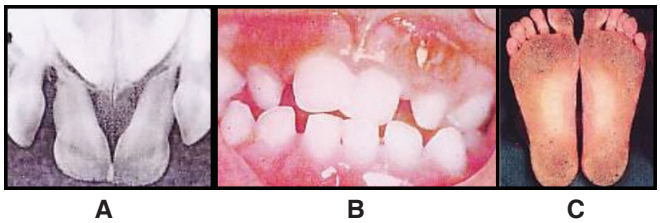


Fig. 20.11: Plummer-Vinson syndrome

Papillon-Lefévre Syndrome

Rare autosomal recessive inherited condition characterized by palmar and plantar hyperkeratosis, early periodontal bone distruction, fetid hyperhydrosis of feet, gingivare red and swollen and hemorrhagic early exfoliation of primary teeth, secondary dentition comes up but by the age of 16 years patient is edentulous. After alveolar returns to normal they tolerate denture well (Figs 20.12A to C).



Figs 20.12A to C: Papillon-Lefévre syndrome

Crest Syndrome

It is a variant of systemic sclerosis, the "CREST "is an acronym for five components calcinosis cutis, Raynaud's phenomenon, esophageal dysfunction, scleroductyly and telangietasias (which are most important and prominent on the face and lips). They can be seen intraorally also.

Pierre Robin Syndome

Severe mandibular micrognathia, in the affected infant, there is posterior cleft palate, and glossoptosis.

Apert's Syndrome

Also called Acrocephalosyndactyly, it is accompanied with a high towering forehead, small beak like nose, tendency to proptosis, premature fusion of number of cranial sutures and maxillary hypoplasia, they are mentally subnormal.

Trisomy Syndrome (Patau's Syndrome)

Bilateral cleft lip and palate, which is microcephaly.

Goldenhar's Syndrome (Oculoauriculovertebral Syndrome)

The infant has ocular dermoid, pedunculated auricular appendix and sometimes bilateral cleft lip and palate (Fig. 20.13).

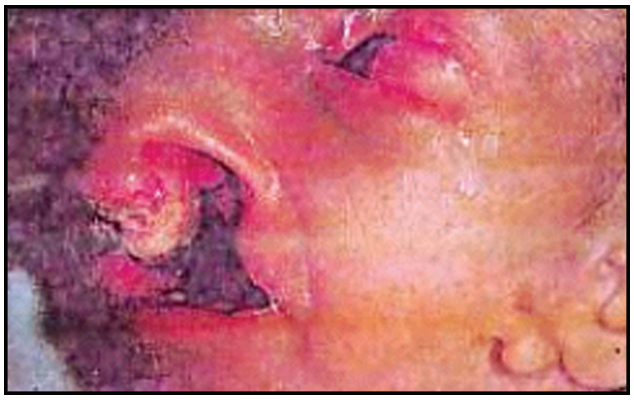


Fig. 20.13: Goldenhar's syndrome

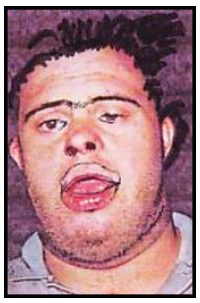


Fig. 20.14: Down syndrome

Down's Syndrome also Called Mongolism

There is underdeveloped middle third of the face, relative mandibular prognathism. Large tongue with a degree of mental retardation (Fig. 20.14).

Froy's Syndrome

The auriculotemporal syndrome is the result of a defective repair of a damaged auriculotemporal nerve, so that the sweat glands become enervated by the parasympathetic salivary fibers. As a result of this anomalous repair, the patient sweats in the temporal area during eating. This is usually either after parotid surgery or mandibular condyle surgery.

Eagle's Syndrome

The patient has pain in the throat as if foreign bodies are present which radiates to ears and side of neck. There is also presence of dysphagia. Calcification of stylohyoid ligament usually coexists (Fig. 20.15).

Branchio-oto-renal Syndrome

It is associated with branchial fistula/cyst, ear pinnas are anomalous, preauricular pit-and long-narrow face, hearing loss,renal dysplasia is present (Fig. 20.16).

Achondroplasia Syndrome

Dwarf and short stature,is due to bone dysplasias. Spine is short, trunk length is spared but limbs are short, macrocephaly and lordosis are present (Fig. 20.17).

Fig. 20.15: Eagle's syndrome

Fig. 20.16: Branchio-oto-renal syndrome

Fig. 20.17: Achondroplasia syndrome

Jadassohn-Lewandowsky Syndrome (Pachyonychia Congenita)

The oral manifestations are development of white hyperkeratotic lesions on the dorsum of tongue and the buccal mucosa along with bite line which are the most common sites. It is a rare genetic syndrome where the finger and toesnails are thickened, tubular in shape, hyperkeratosis of palms and soles with hyperhidrosis (Figs 20.18A to C).

Tuberous Sclerosis

There is triad epilepsy, mental retardation and cutaneous angiofibromas. Such lesions are present on gingiva and other sites of oral mucosa. They die before the age of 25 (Figs 20.19A and B).

Darier's Disease (Keratosis Follicularis)

About 50 percent patients show oral symptoms. Rough, grey, white, papules on the hard palate and gingival the condition appears during childhood or adolescence with yellowish-brown patches behind the ears, around nose and other parts of the body (Figs 21.20A to C).

Ehlers-Danlos Syndrome

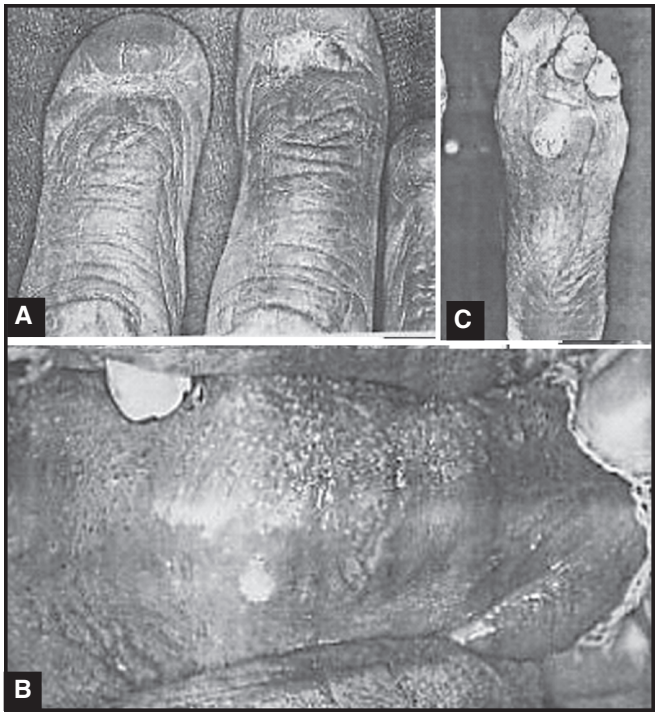
There is hyperelasticity and friability of skin, hyper extensibility of the joints, at times multiple freely movable subcutaneous fatty nodules. Prophylaxis against injury is very important. No specific therapy.

Crouzon Disease

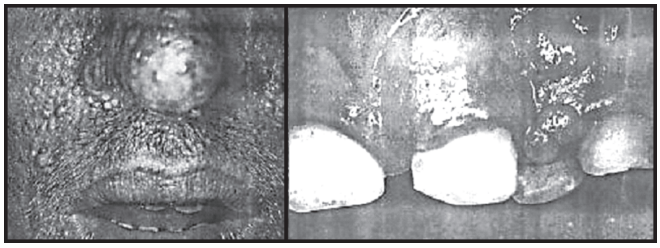
Acrocephaly (tower skull), hypoplastic maxilla, protrusion of lower lip, exophthalmos, external strabismus, hypertelorism.

Klippel-Feil Syndrome

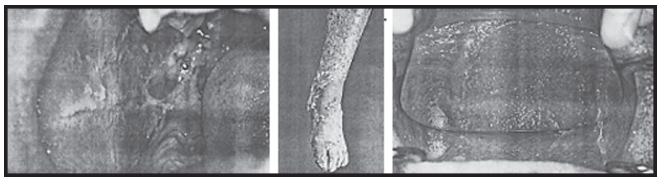
Fusion of some or all cervical vertebrae or multiple hemivertebrae into one osseous mass. The neck is short, and movements restricted, hair line is low, other defects including scoliosis, cervical rib, spina bifida, torticollis, webbed neck and congenital high position of scapula may be present.



Figs 20.18A to C: Pachyonychia congenita



Figs 20.19A and B: Tuberous sclerosis



Figs 20.20A to C: Darier's disease

Laurence-Moon-Biedl Syndrome

Retinitis pigmentosa, polyductyly, obesity, hypogenitalism and mental retardation, may be associated with other abnormalities.

Bonnevie-Ullrich Syndrome

Called pterygium colli. Congenital webbed neck, shortness of stature, cubitus valgus, may be

- associated with lymphedema of hands and feet,
- varian agenesis, sexual infantalism, shild chest, cardiac anomalies, polyurea, increase excretion of gonadotropin.

Heck's Disease

An uncommon benign oral condition characterized by multiple circumscribed, sessile, soft, elevated nodules of same color as the oral mucosa. It occurs commonly in younger individuals of certain racial groups. It affects lips, labial mucosa, gingival part, tonsil and tongue.

Gorlin-Goltz Syndrome

Rare autosomal dominant disorder characterized by multiple basal cell carcinomas, odontogenic keratocysts, tumors, and systemic anomalies.

Caffey-Smith Syndrome

Familial disease of unknown etiology, which produces irritability, fever and non-suppurative tender, painful, swellings involving almost any bone of body but mostly in mandible, clavicle and ulna. They are limited to shafts only. Cortical hyperostosis is seen in X-rays, corticoids may prove successful in some cases.

Klinefelter's Syndrome

This appears at puberty and is characterized by bilateral gynecomastia very small testicles and spermatogenesis.

There is high anterior pituitary follicle—stimulating hormone and diminished 17 ketosteroid excretion. Etiology is still obscure.

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2. Roberts, E and Schour, I: Hereditary Opalescent Dentin (Dentinogenesis Imperfecta). Am J Orthod and Oral Surg 25:267-276, March 1939.

Oropharynx: Applied Anatomy 21

The structural knowledge is well taught in dentistry during the curriculum and is very well known to the readers. We need here to put up sketches, diagrams, and significant important information worth not noting to help the reader to recapitulate when needed to deal with anatomy before operative surgery of that part of body of dental patients. The sub-specialties in dentistry have already narrowed down the spectrum, but it is always essential to appreciate and evaluate the therapeutic predictions, expected positive outcomes and also the risks involved in the particular surgical expedition undertaken as the borders always overlap and may get complicated.

ANATOMICAL TERMS OF RELATION COMMONLY USED

1. Anterior—towards the front.
2. Posterior—towards the back.
3. Superier—towards the head.
4. Inferier—towards feet.
5. Medial—towards median plain.
6. Lateral—away from median plain.

PLAINS

Different kinds of plains are discussed below (Figs 21.1 and 21.2)

1. *Sagittal:* any plain parallel to the median plain.
2. *Coronal or Frontal plain*: a vertical plain at right angle to the median plain.
3. *Transverse plain:* a plain at right angles to a vertical plain or right angles to the longitudinal axis of any part.
4. *Horizontal plain:* a plain parellel to the horizon (ground) median plane.
5. *Oblique plain:* any plain other than mentioned.

BONES OF SKELETAL SYSTEM = 206

(They give shape, support and meet stress)

Total bones are 206	
I. Axial skeleton	
Skull	
Cranium	8
Face	14
Hyoid	1
Auditory ossicles (3 in each ear)	6
Vertebral column	26
Thorax	
Sternum	1
Ribs	24
	80
II. Appendicular skeletion	
Pectoral (shoulder) girdles	
Clavicle	2
Scapula	2

Contd...

Contd...

Upper extremities	
Humerus	2
Ulna	2
Radius	2
Carpals	16
Metacarpals	10
Phalanges	28
Pelvic (hip) girdle	
Coxial, pelvic, or hip bone	2
Lower extremities	
Femur	2
Fibula	2
Tibia	2
Patella	2
Tarsals	14
Metatarsals	10
Phalanges	28
	126
Total	*206*

Functions

1. Bones give shape and support to the body, and resist all form of stress. Take part in offences and defence actions.

Arteries of face

Figure 21.3 facial arteries main+transverse facial+art. accompanying cutaneous nerves.

Veins of the face

Figure 21.4 these are accompanying the arteries and their arrangement is "W" shaped. *The importance of venous connection with cavernous sinus when infection travels from this area can cause cavernous sinus thrombosis* (Fig. 21.5).

Lymphatic system

Which is an essentially a drainage system as illustrated in Figure 21.6. The capillaries absorb most of tissue fluid and remaining 10 to 20 percent

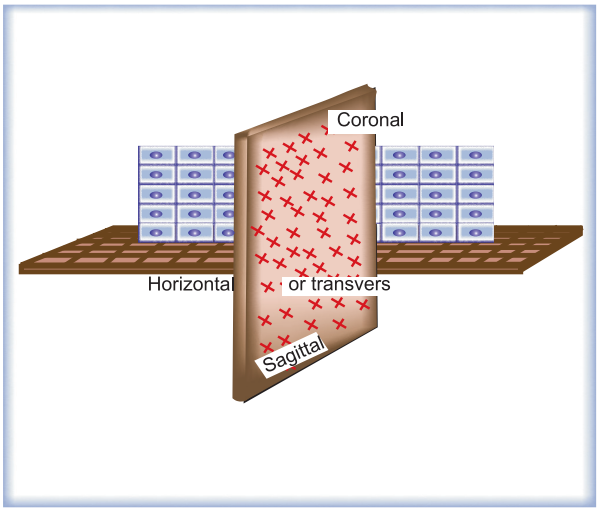


Fig. 21.1: Various plains explained

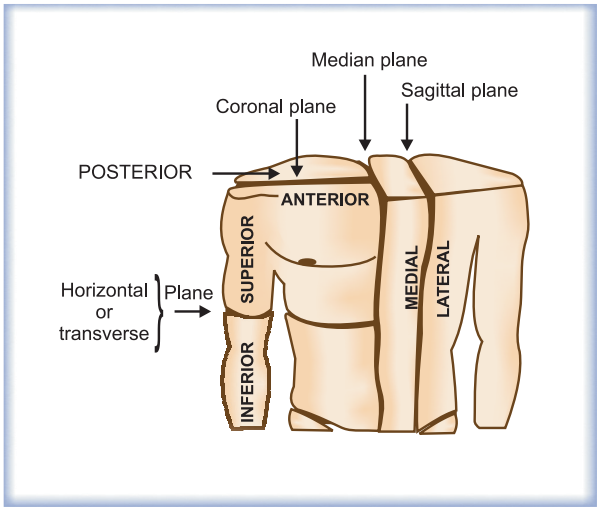


Fig. 21.2: Various plains explained

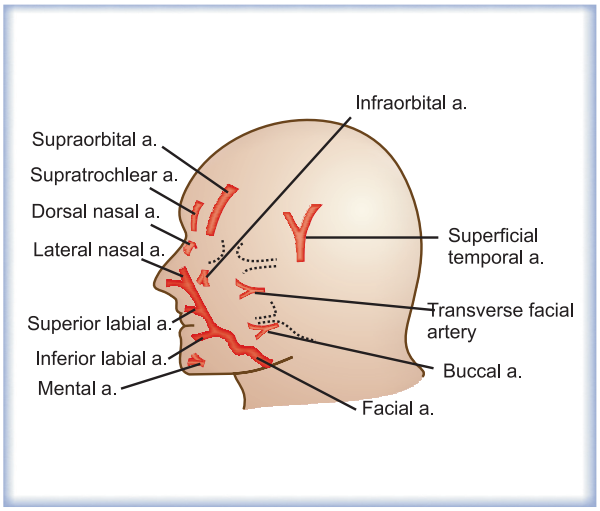


Fig. 21.3: Arterial supply of face

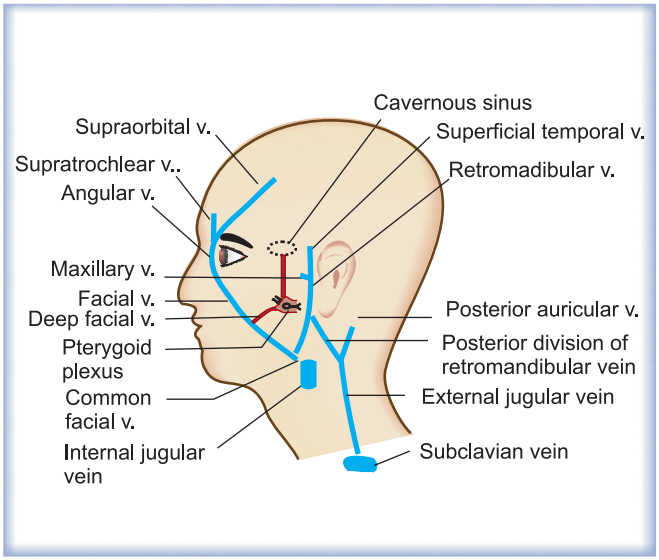


Fig. 21.4: The veins of the face and their deep connections with the cavernous sinus and the pterygoid plexus of veins

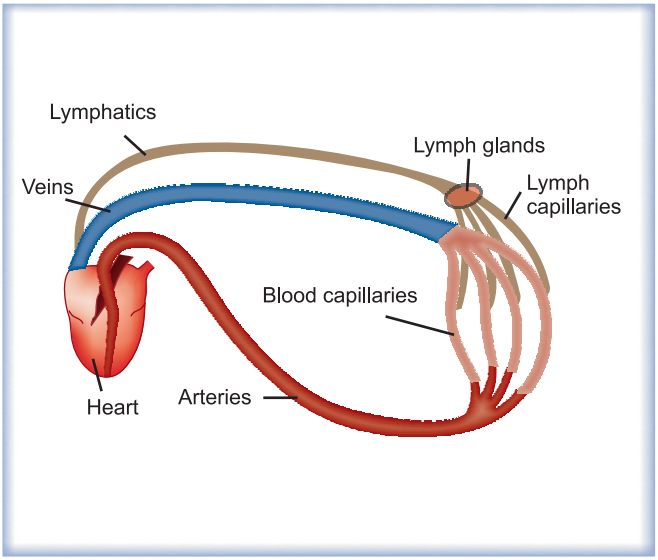


Fig. 21.6: Figurative presentation to show arteries vein and lymphatic circulation

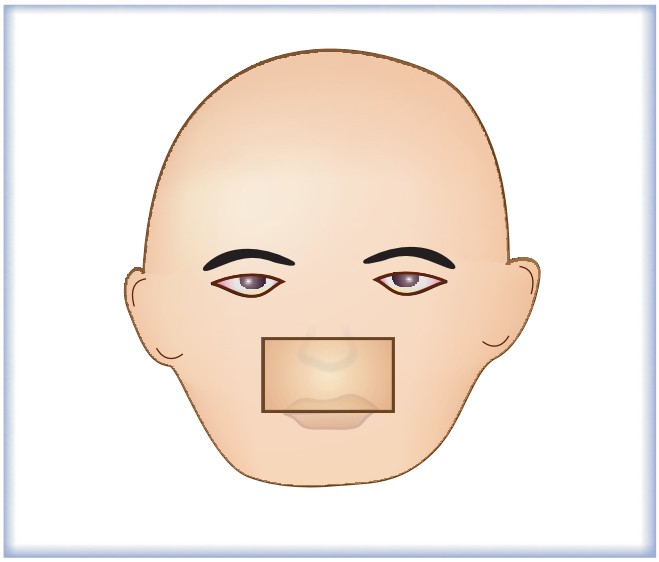


Fig. 21.5: Denger area of the face (slippled). Spread of infection from this area can cause thrombosis of the cavernous sinus

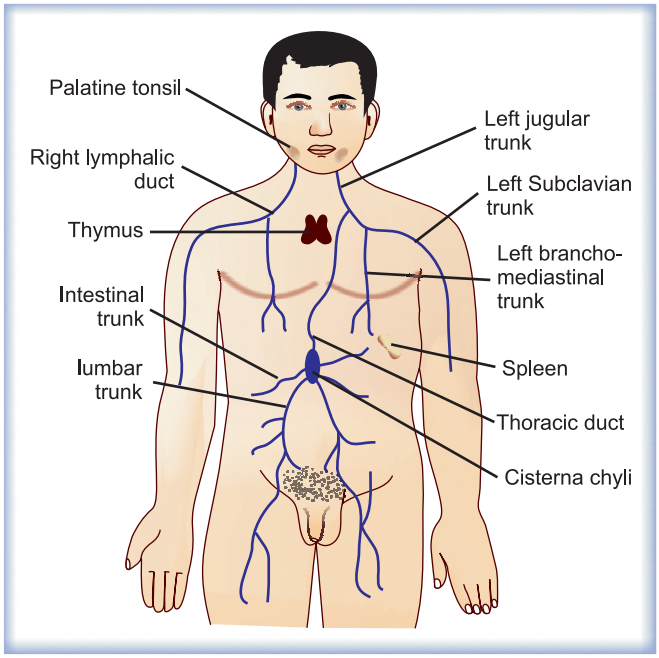


Fig. 21.7: Major lymphatic cannels, and the tonsils, thymus and spleen. The smaller lymphatic vessels that run with or near arteries and veins are not shown

is absorbed by lymphatics which begin blindly in the tissue places. *It is important to know that the larger Particles (especially proteins) can only be removed from the tissue fluids by lymphatics. Certain part of lymphatic system is connected with Lympho-reticular organs which are chiefly involved in phagocytosis, raising immune responses and contributing to increasing the white cell population. See Figure 21.7 where major lymphatic channels are connected with tonsils, thymus and spleen.*

Table 21.1: Cutaneous nerves of the face

Sources	*Cutaneous nerves*	*Areas of distribution*
A. Ophthalmic division of trigeminal n.	1. Supratrochlear n. 2. Supraorbital n. 3. Lacrimal n. 4. Infratrochlear n. 5. External nasal n.	Scalp up to vertex, forehead; upper eyelid; conjunctiva; and root, dorsum and tip of nose.
B. Maxillary division of trigeminal n.	1. Infraorbital n. 2. Zygomaticofacial n. 3. Zygomaticotemporal n.	Upper lip; side and ala of none; lower eyelid; upper part of cheek; and anterior part of temple.
C. Mandibular division of trigeminal n.	1. Auriculotemporal n. 2. Buccal n. 3. Mental n.	Lower lip; chin; lowr part of cheek; lower jaw except over the angle and lower surface of auricle; and side of head.
D. Cervical plexus	1. Anterior division of great auricular n. (C2, 3). (anterior) cutaneous nerve of neck (C2, 3).	Skin over the angle of the jaw and over the parotid gland. jaw.

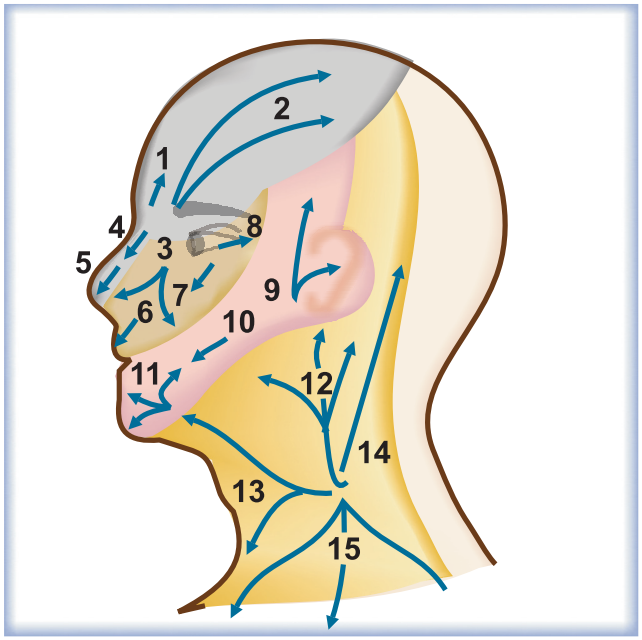


Fig. 21.8: The sensory nerves of the face, 1. Supratrochlear n, 2. Supraorbital n, 3. Palpebral branch of lacrimal n, 4. Infratrochlear n, 5. External nasal nerve, 6. Infraorbital n, 7. Zygomaticofacial n, 8. Zygomaticotemporal n, 9. Auriculo-temporal n, 10. Buccal n, 11. Mental n, 12. Great auricular n, 13. Transverse cutaneous nerve of neck, 14. Lesser occipital nerve, 15. Supraclavicular ns

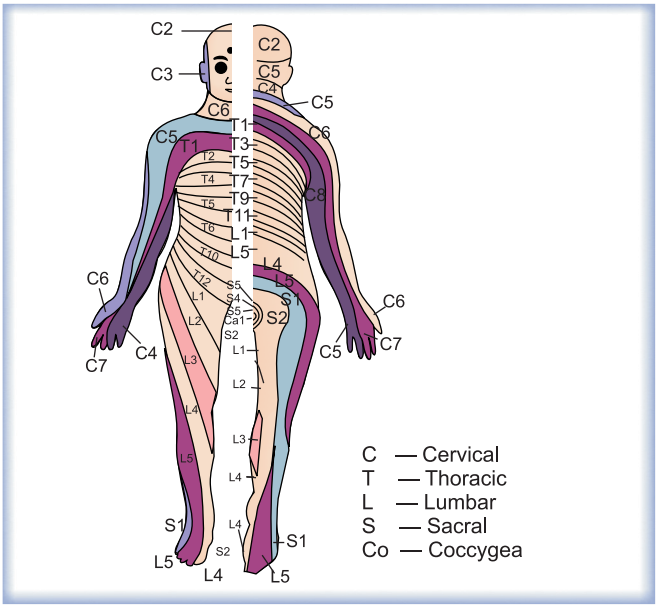


Fig. 21.9: Typical spinal nerve. Supplying the parts of body

Nerve Supply to Face and Oropharynx

See Table 21.1 and Figures 21.8 to 21.12. which are self-explanatory. (They are motor, sensory, sympathetic and parasympathetic).

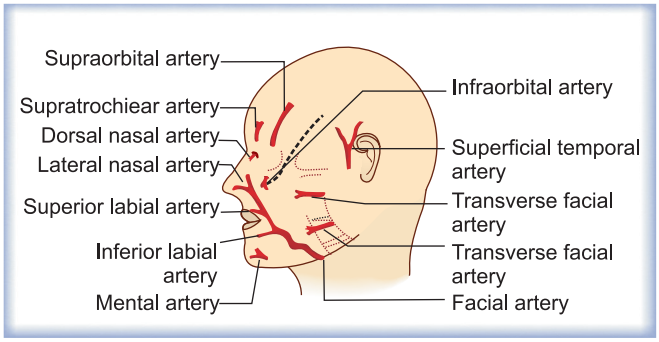


Fig. 21.10: Arteries of the face

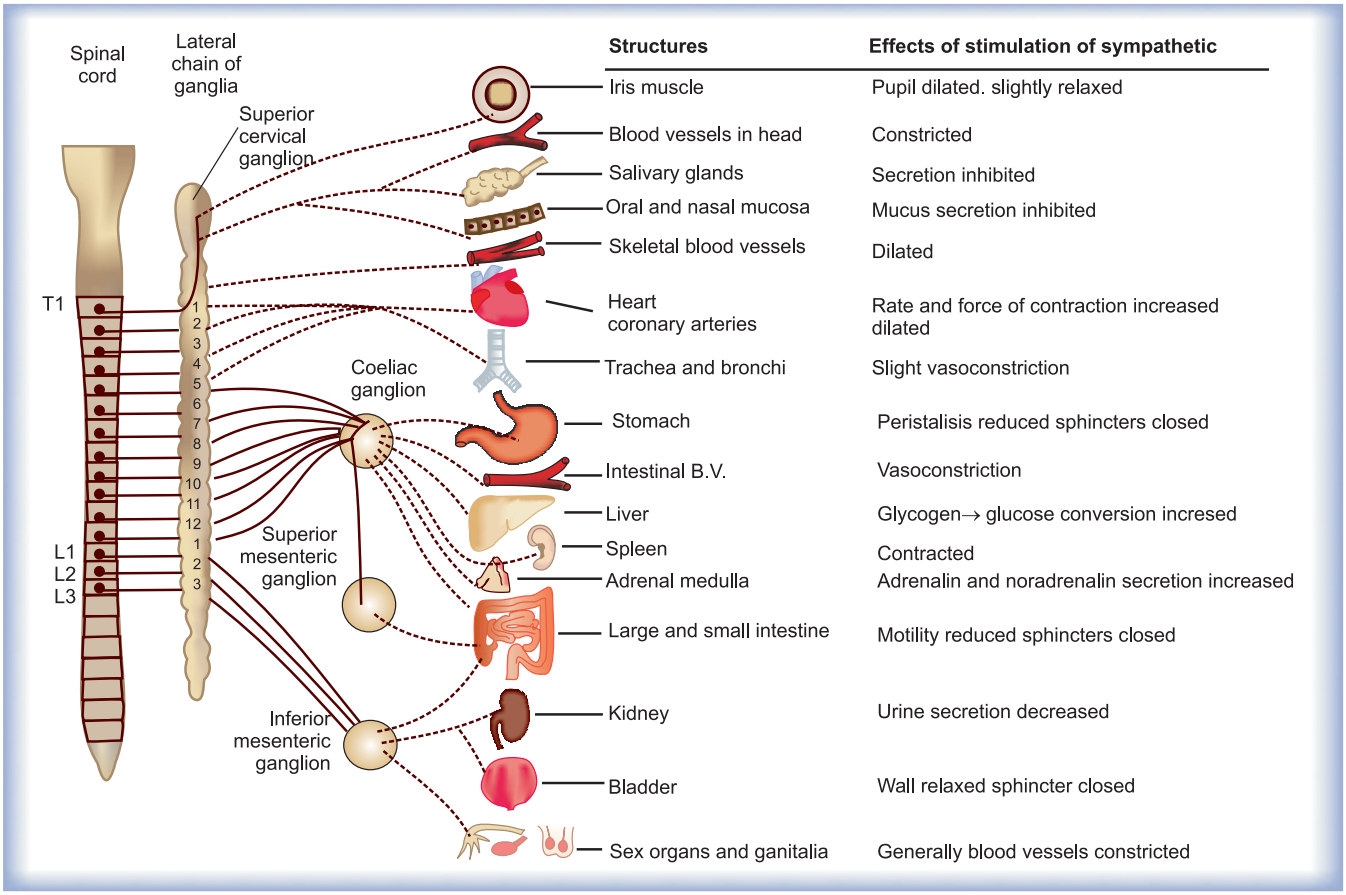


Fig. 21.11: The sympathetic outflow the main structures supplied and the effects of stimulation. Solid lines- preganglionic fibers : broken lines—postganglionic fibers

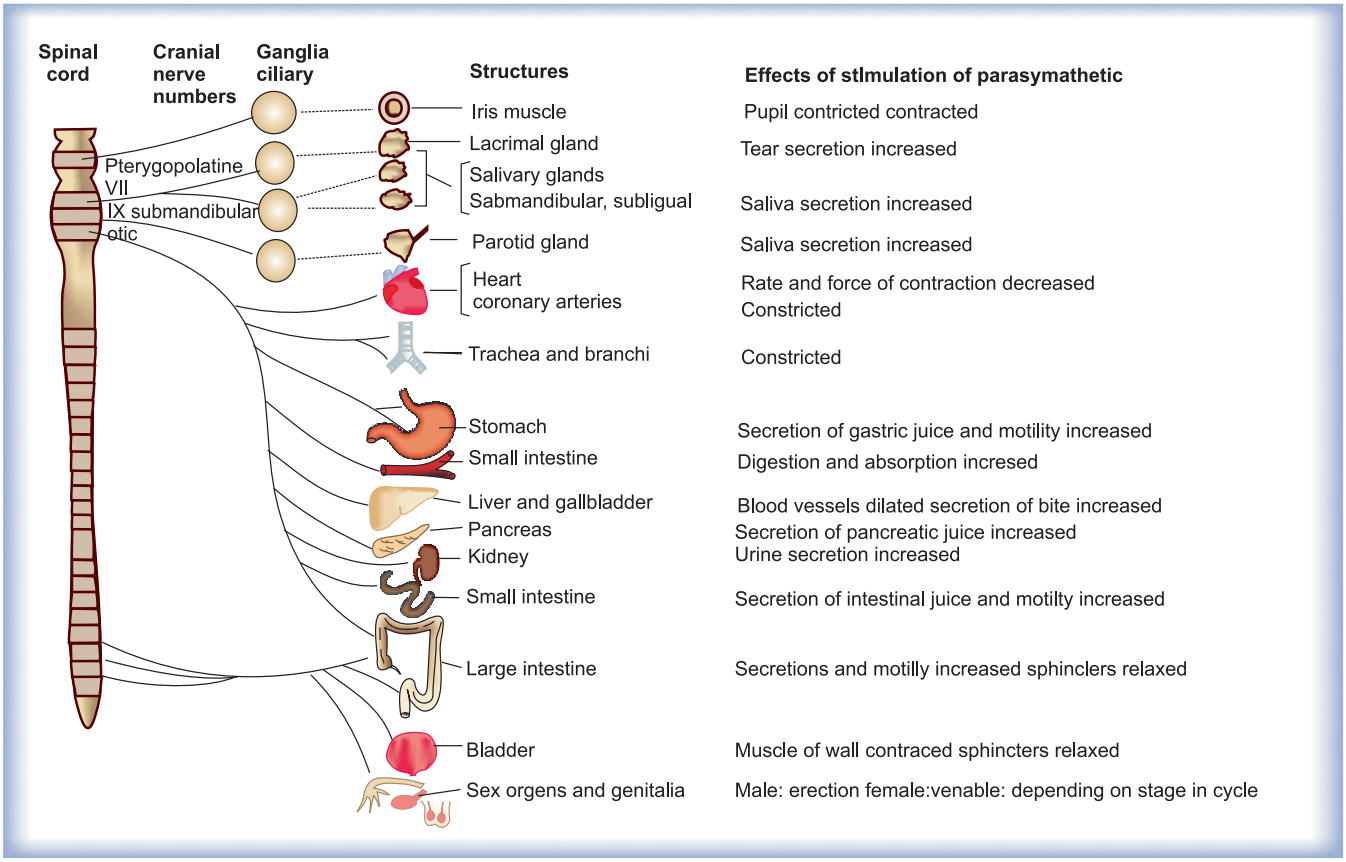


Fig. 21.12: The parasympathetic outflow, the main structures supplied and the effects of stimulation. Solid lines-preganglionic fibers; broken lines—postganglionic fibres. Where there are no broken lines, the 2nd neurone is in the wall of the structure

Sketch of Applied Oropharyngeal Pathology 22

This denotes the word" sketch" itself excludes the detailed descriptive presentation of histopathology, biochemical aspects and limits itself to clinical conditions come across in clinical practice only. More stress is given to common disorders rather than rare conditions that may require to refer elaborate literature/textbooks. It is to give a broad perspective/outline. In order to understand the pathological basis in relation to it's anatomical entity with physiological back ground. All this is for clarity, simplicity, and easiness to remember at the right moment when needed. When structures cross the functional limit of normality it is pathological.

ETIOLOGICAL BASIS

1. Infections—Bacterial, rickettsial viral, fungal.
2. Infestation—Worm diseases.
3. Trauma/injection accidents, sports, surgery.
4. Defects by birth—Congenital anomalies.
5. Neoplastic—Benign, malignant matastatic.
6. Allergy—Hypersensitivity.
7. Toxins, poisons, and drugs side actions/incompatibility/Mismatched Transfusions.
8. Nutritional—Malnutrition, subnutrition obacity famin, wars, natural calamities, starvation, water and electrolyte depletion.
9. Metabolic—Diabetes mellitus.
10. Neurological—Motor, sensory, sympathetic, parasympathetic leisions
11. psychogenic—Depression, pychosis, mania, etc.
12. Endocrine—Conditions due to hypo or hyper, secretion of hormones.
13. Conditions of unknown etiology, the rare diseases.

ANATOMICAL BASIS

1. Mouth. Mouth breathing.
2. Lips—lip biting, lip licking, lip sucking, herpes labialis, con.fistula of lip.
3. Gums/gingival/in broader sense complete periodontal structure "periodontium"—Inferior microbial, dental plaques, acute and chronic gingivitis leading to abscess.
4. Teeth—Congenital anomalies, caries.
5. Tongue—Macro/microglossia, ankyloglossia, strawberry tongue, fissured tongue, black hairy tongue, nevus.
6. Tonsils—Enlargement, diphtheria patch.
7. Oral mucosa—Hereditary hemorrhagic telangiectasis.

8. Palate—Cleft palate.
9. Epiglottis—edema, foreign body.
10. Salivary glands—Mumps, sialadenitis, sialosis (calculi blocking the duct) tumors, benign enlargement Sjögren's disease Miculicz's disease.
11. Bones—Osteomyelitis, osteoma, cysts, osteosarcoma.
12. TMJ dislocation, ac.and ch. arthritis,
13. Neck—Thyroglossal cyst
14. Congenital—Defects, (See syndromes chapter.)

APPLIED OROPHARYNGEAL PHOTO-ILLUSTRATIVE CLINICAL PATHOLOGY

A food for visualization - remembrance and always keeping behind the back of mind, verifying their presence or positive absence, while examining the patients in practice. More stress is given to common disorders rather than rare conditions demanding reference to elaborate literature and texts. An attempt is made to present with clarity and simplicity of understanding and easiness to remember at the right moment when needed.

OROPHARYNGEAL PATHOLOGICAL CONDITIONS PRODUCED BY SYSTEMIC DISEASES

Anemia's and Leukemia's

Iron deficiency anemia

Most common type of anemia in the world. It occurs mainly in women of childbearing age due to enhanced demand for iron against depletion of iron stores from loss of blood due to menstruation devivery and increased requirement during pregnancy and lactation.

Clinically there is glossitis, angular stomatitis, spoon shaped nails (koilonychias) and atrophy of mucosa of pharynx and stomach sometimes give rise to dysphagia known as Plummer-Vinson syndrome Ferrous salts tab. or liquid forms are consumed causing extrinsic stains limited to the cervical areas of the labial surface of the maxillary incisors and canine as seen in the Figure 22.1.

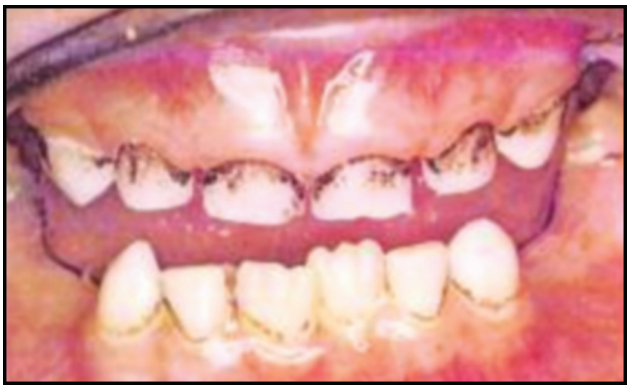


Fig. 22.1: Stains of iron on incisors and canine

Sickle Cell Anemia

Most common in negroes less in other races. It is due to abnormal hemoglobin's distorting the RBC and produce characteristic sickle shaped cells. These increase the blood viscosity and distruction.

It is caused by the presence of abnormal Haemoglobin-S which after deoxygenated produce a substance which distort the RBC membrane and produce sickle shaped cells. Due to increased viscosity they tend to cause thrombosis and infarctions serious episodes with severe pain, swelling and tenderness of the particular organ. Clinically this disorder presents ch. anemia, persistent jaundice, cardiomegaly, ulcers on legs, bossing on skull prominent malar bones, protuberant teeth and yellowish gingival tissue as seen in the Figure 22.2.

Pernicious anemia

It is due to failure of secretion of intrinsic factor B_{12} by the stomach. It is rare before the age of 30, and affects females more than males between the age of 45 and 65 years and is often familial. There is

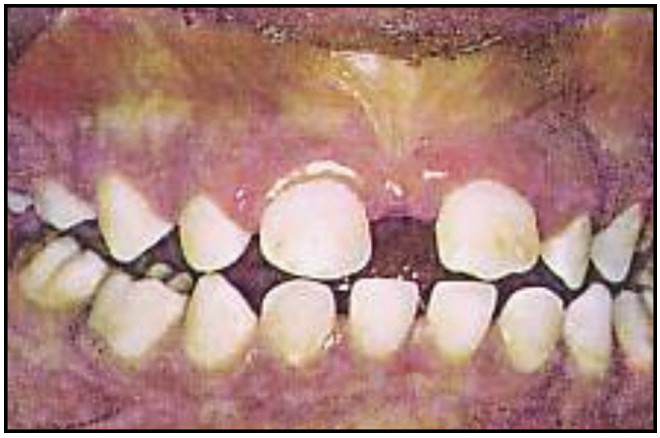


Fig. 22.2: Yellowish gingival tissues is shown

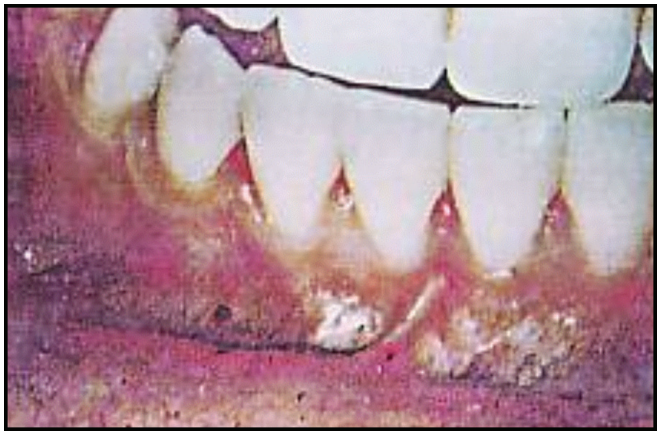


Fig. 22.4: Necrotic ulcers in gums due aplastic anemia

intermittent soreness of tongue and sometimes it is red and inflamed. There is achlorhydria, urine contains urobilinogen, serum bilirubin is raised. Neurological symptoms of subacute—Combined degeneration start, and if not treated lead to dementia. The Figure 22.3. shows the changes in the tongue.

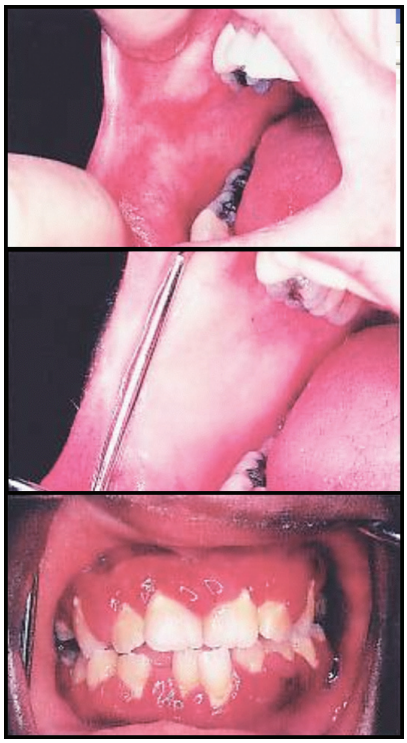


Fig. 22.3: Colour changes in the tongue and gums

Aplastic anemia (primary pancytopenia)

A rare disorder of unknown etiology. The bone marrow shows reduction of all blood forming elements. It can occur at any age but common in young adults, and elderly. There is progressive anemia, with bleeding in skin, mucous membrane, due to low thrombocytopenia, fever, necrotic ulcers in mouth, and tongue or throat due to leucopenia (Fig. 22.4).

Leukemias

Disorder of unknown etiology where an abnormal uncontrolled proliferation of leucopoietic tissue is bone membrane producing WBC of one type associated with increasing number and with immature forms appearing in the circulation. This can be in acute and chronic forms. There is fever, anemia and bleeding episodes such as epistaxis, bleeding gums and hypertrophy joint pains, lymphadenopathy. Variety of treatments do alter the course including radiotherapy but the outcome is fatal.

Bleeding Disorders

Thrombocytopenic purpura

Disease of unknown etiology characterized by quantitative deficiency of platelets. Bleeding from

any site, nose, GI and GU tract, brain, subaracnoid space. There is anemia, thrombocytopenia, BT that is increased 15 to 20 minutes, CT is normal, capillary resistance test is strongly positive. Splenectomy is found beneficial and children on corticoids have shown spontaneous cure.

Avitaminosis

Rickets

It is disease of disturbed calcium and phosphorus metabolism due to vitamin D deficiency. Lack of sun light is main cause. It is liable to occur in premature babies. In the clinical rickets the serum calcium and phosphorus may be normal but the alkaline phosphates is increased. Apparently the child looks well nourished, but is pale, toneless, suffer oversweating of head, delayed teething and mile stones, fails to sit, stand, crawl, stand, and walk. The bony changes are remarkable, craniotabes (small round unossified areas on membranous skull bone yielding to finger pressure). Enlargement of lower end of radius and costochondral junction of ribs "rickets rosary", bossing of frontal and parietal bones, pigeon chest, knock knees, bow legs and pelvic deformities. There is hypoplasia of enamel of the teeth.

Scurvy

The avitaminosis of vitamin C deficiency. It is due to inadequate intake of citrus fruits, green vegetables. Its concentration is higher in adrenals and is intimately concerned in body reaction to stress. It is water-soluble and easily destroyed by heat. Its daily requirement is 30 to 70 mg. Its deficiency results in defective formation of collagen inactive tissue resulting in delayed healing of wounds, defective oteoid tissue in children and also capillary hemorrhages. It is most common in 7 months to 2 years. They are irritable, legs are held in typical "Frog" position and movements are less (pseudoparalysis) and edematous due to subperiosteal hemorrhages. X-rays shows thinning of cortices, ground glass appearance and irregular epiphyseal line, bleeding episodes and anemia. In adult-scurvy the pathognomonic sign is swollen, spongy, bleeding gums particularly in the papillae in-between teeth.

Pellagra (Nicotinic acid deficiency)

Three "Ds" are remembered, i.e. dermatosis, diarrhea, and dementia. Initially burning sensation is felt in hands and feet, weakness and then symmetrical areas of erythema on shin and other exposed parts of body. There is redness of tongue, stomatitis, vomiting, and diarrhea. The CNS symptoms manifest in depression, insomnia and ultimately in untreated cases result in dementia.

The treatment is to replace niacin 50 to 300 mg/day by IV or IM rout. Oral dried yeast 5 to 30 mg tds and well balanced diet will serve the purpose. It shows the atrophic "bald" tongue and rough pigmented skin of neck, and chest skin parts exposed to sun light.

Allergic Gingivostomatitis

There is intense hyperemia and enlargement of tongue filiform papillae are lost, lips dry, scaly, atrophic and angular cheilitis.

It shows hyperplastic and erythematoses, gingivitis and cheilitis.

Skin Diseases

Systamic Lupus Erythematosis (SLE)

This disease is due to autoimmune vasculitis causing lesions in skin, joints, kidneys, spleen, pleura, pericardium, endocardium and CNS. It is rarely acute fulminating type, but usually runs chronic course with intermission.

Over 90 percent cases occur in women between the age of 20 amd 40 years, starting with fever and migratory arthralgia like rheumatic fever. Urine contains proteins, ESR is high, and there is anemia.

There is butterfly rash on the face, splenomegaly, pleural/pericardial effusion. The renal failure is usually the cause of death. Corticoids/chloroquin may prove valuable in controlling the disease.

Systemic Sclerosis

(Scleroderma) disorder of unknown etiology category of autoimmune collagen-vascular disease involving mainly skin due to dermal fibrosis and indurations resulting into claw-hands, puckered mouth, restricted mobility of tongue, and widening of periodontal space. It shows the facts the fibrosis involve internal organs also such as lungs, heart, GI tract and kidneys. Other features are Raynaud's phenomena, telangietasia, soft tissue calcification and arthritis. ESR is elevated. Oral manifestations such as non-ability of opening mouth, loss of mobility of tongue due to lingual fibrosis. The anterior maxillary teeth are often exposed due to perioral constriction. The disease is progressive and death is due to complications.

Pemphigus Vulgaris

An autoimmune disorder developing vesiculobullous lesions on the skin and mucous membranes. It is common in middle-aged people affecting both sexes equally. Pemphigus vulgaris is most common from all types and exhibit oral manifestations. On the skin vehicles appear and become bullae that can arise on normal skin. Have got erythematous base these blisters are fragile and rupture easily, producing painful new denuded areas thereafter, sloughing scaling, and crusting and form ulcer thereafter.

Oral involvement is extremely common in over 90 percent of patients. Sometimes the regions are originated in the mouth first and then on the skin. Onset is slow, insidious with erythema, gingival involvement may resemble desquamative gingivitis. Blisters are rarely seen. There is wide spread erosions. Pain resulting into weight loss is common due to eating difficulties.

Diseases of Bones

Paget's disease (Osteitis deformans)

Chronic skeletal disease of unknown cause. It may be localized to one bone or wide spread throughout the skeletal. It appears after the age of 55. Jaws are rarely involved. When the disease occurs it is mostly seen in maxilla where a progressive symmetrical maxillary enlargement that may reach massive proportion. The teeth may become progressively spaced apart and extensive root hypercementosis may be present. In early stages the affected bones affects demineralized and radiographic examination in later stages shows irregular "cotton wool" appearance. There is increase in the level of serum alkaline phosphatase. No specific treatment the function may be improved by surgical reduction of the enlarged jaw. Shows the symmetrical maxillary enlargement and irregular radio foci "cotton wool" appearance is the skall bone.

Syphilis

Caused by Spirochaete, Treponema pallidum is usually acquired through sexual intercourse. The disease is insidious and occurs in primary, secondary and tertiary stages. The primary stage is marked by ulceration called chancre and in tertiary you get gumma . In between the disease enters a phase of denancy and may last for years together 30 percent of the patient proceeds in tertiary stage. The tongue and palate are most frequent locations of intraoral gummas on occasion perforation of pallet may occur. First two stages are highly infectious but third is relatively non-infectious. Effective treatment is antibiotic, penicillin is a drug of choice.

Congenital Syphilis

Where the fetus can acquire syphilis from a infected mother after the 5th month of gestation. Usually abortions are common in the infected mother or

occasionally the fetus may die soon after the delivery. The historical diagnosis of fetus is known as Hutchinson's triad, i.e. hypoplasia of the teeth (Hutchinson incisors and mulberry molars) eight nerve deafness and interstitial keratitis.

HIV Infection

Acquired immune deficiency syndrome is caused by a virus that gets into the body usually through sexual contacts. Although it may be caused due to the blood transfusion due to the infected blood 90 percent of cases have been detected in homosexuals or bi-sexual men and intravenous injections. The indicator of diseases includes a long list like cancer, TB, pneumonitis and candidiasis and Kaposi's sarcoma, oral changes are important due to definitive diagnosis clinically evident due to candidiasis of oral cavity in absence of predisposing factor is often due to HIV infection. The mucosa is red and pseudomembranous and hyperplastic and white. Majority of patients with sarcoma are confused with hemangioma or hematoma. Almost all patients with leukoplakia are infected with HIV and denote rapidly developing AIDS. It shows defused white alteration of the pallet, Kaposi's sarcoma, hairy leukoplakia, histoplasmosis even herpes simplex and periodontitis.

Systemic Diseases including Drugs and Chemicals Causing Pigmentation of Oral Cavity

Addison's disease

Addison's disease are primary adrenocortical insufficiency is a rare disorder caused by inadequate production of cortisol and other adrenal steroids. In the past tuberculosis was the most common cause but now most frequent cause is idiopathic adrenocortical atrophy due to autoimmune disorder. Clinically there is hyperpigmentation of the skin affecting the oral mucosa. Other manifestations include weakness, fatigue, weight loss and gastrointestinal complaint, hypotension and loss of electrolyte balance. Treatment consist of replacement of corticoids.

Antimalarial Pigmentation

Palatal hyperpigmentation secondary to chloroquin is seen.

Diabetes mellitus has increased susceptibility to the development of gingivitis and periodontitis. Secondly to alter host defenses, lower resistance to infection and decreases effectiveness of the healing process. Uncontrolled diabetes shows more rapid progressive periodontitis and more periodontal abscesses. The unique pattern is erythematic hyperplasic gingivitis. It is common in the juvenile diabetes where gingival infection is most marked.

Leukoderma

Leukoderma is a variation of oral mucosa in which involved issues appear white or gray with a filmy hue. The tissue may be thickened to form prominent wrinkles. It is usually seen on the buckle mucosa bilaterally but mucosa is common. Mostly seen in black men and common in tobacco users. When the tissue is stretched the whiteness disappears or when it is relaxed the typical features reappear. The treatment is uncertain.

Malignant Melanoma

Malignant melanoma is cancer of melanocytes that primarily occurs on skin but may occur on the anterior premaxillary gingival alveolar are the most common locations. The intraoral region is usually dark brown to blue black and may appear flat, nodular, ulcerated. Metastasis to regional lymph nodes is common in men and develops primarily in adults. The prognosis is poor and treatment is mostly surgical. It shows large black exospheric mass originating from the fissure maxillary gingival and also large pigmented ulceration on the hard palate.

Tetracycline Pigmentation

This is due to the treatment of the patient by oral or injection of tetracycline and there is intrinsic strain of the teeth occurring permanent detention of teeth of all these children is associated with a ingestion of tetracycline drugs during early childhood.

Neurological Disorder

Facial palsy (Bell's palsy) it is due to paralysis of facial muscles. The face is pulled forth to the opposite side and they also suffer from loss of taste on the anterior portion of the tongue and cant close the eye on affected side or can blow the check fully.

Cretinism

This is due to congenital hypothyroidism. The face shows puffiness about eyes, large protruding tongue and dry spare hair. Their development is slow. Then sleep well and do not cry for feed. They are usually constipats.

Miscellaneous

Amyloidosis

Amyloidosis refers to a group of disorder characterized by deposition of protein material (amyloid) in the body tissues. Wide spread deposition may occur in absence of underlying disease, in association with multiple myeloma and secondly to variety of chronic inflammatory conditions such of tuberculosis, osteomylitis, or rheumatoid arthritis. Oral involvement is frequently seen, usually affecting the tongue and gingiva. It produces macroglossia, with indentations often observed against lateral border from pressure against the teeth. It shows elevation of the surface nodularity of tongue.

Acute Pseudomembranous Candidiasis (Thrush) The irregular white lesion covering the vault of the hard palate is due to infection with candida albicans. The patient receiving antibiotics and chemotherapy for leukemia for long-time.

Desquamative Gingivitis

It is a chronic inflammatory condition of the gingival characterized by development of painful, erythematous, erosive lesions. Although it can occur in any sex and at any age but commonly it can be seen in females. Possibly associated with hormonal changes. Specific diagnosis must be established with biopsy.

Chickenpox (Varicella)

The tongue is frequently involved during the onset of viral disease chickenpox. A child shows typical vesicles, some of which have already ruptured to form painful ulcers covered by a white or yellowish exudate.

Geriatric Dentistry 23

The number of senior citizens is increasing globally and the upper age limit of 75 to 85 years will result in this number to nearly be double in the coming 20 years. (As per the report of OP.P.C.S. 1992). It is also increasing day by day probably due to prevention of infective/infectious diseases, early diagnosis and advanced effective treatment of systemic disorders in time. At the same time there is a massive increase in the incidence of cerebral deficiencies and senile related dementias and other ageing problems to be faced by geriatricians, specialized nursing staff and the relations.

There is an increased consciousness of the problems of aged and geriatric homes/hospitals are available within affordable geriatric pension limits. There are more and more remedial facilities available for ageing disabilities. So that the old people can lead comfortable life. Such as cataracts, hearing aids, laser ray prostatectomy, surgery, etc. Thus, the senior citizens are minimizing the risks of morbidity/mortality day-by-day.

The regular health check-ups in geriatric homes/hospitals with early diagnosis and treatment are yielding results. The trained and experienced nursing care and treatment are yielding good results. The trained and experienced nursing and auxiliary service staff are helping substantially to overcome the physical difficulties of the aged and help them to lead a normal comfortable life.

It is a well-known fact that geriatric dentistry is an important/essential part of health maintenance of the aged and therefore it should also be taught to the students compulsorily in all the teaching medical and dental institutions.

NORMAL AGEING CHANGES IN ORAL APPARATUS

1. Deepening wrinkles.
2. Osteoporosis changes in bone and TMJ.
3. Diminished saliva.
4. Lips look atrophic and pale.
5. Teeth looses enamel and become darkened, the alveolar ridges are atrophied.
6. The tongue becomes fissured and the papillae are atrophied, so the dorsal part looks smooth, but there is more varicosity. There is a gradual loss of taste and even ageusia (complete loss of taste).

HOW GERIATRICS DIFFERS FROM OTHERS

General principles remaining the same still there are subtle differences as mentioned below:

1. There is a decrement in physiological functions and reserves, absorption, detoxification and excretion is slow, metabolic and therapeutic actions are more prolonged and erratic, the safety margin is reduced considerably.
2. The degenerative processes are progressing day-by-day.
3. Sequel and complications of chronic diseases e.g. bronchitis, diabetes, hypertension start appearing progressively.
4. Usually there are multiple pathologies.
5. Abnormal thyroid function disturbs metabolism.
6. Conditions due to ageing such as cataract, glaucoma, loss of hearing EP, Parkinson's disease, depression, dementia, etc post-retirement syndrome due to change of routine and environment, loss of interest, and sexual impotence appears.
7. The exostosis of palate (torus palatines) and sometimes of mandible are normal but may interfere with construction of prostheses requiring ablation.
8. Due to atrophy of alveolar ridges the denture show lowered efficiency.
9. There is a recession of gingival and diminution of periodontal teeth support.

THE PHYSICAL EXAMINATION

First history taking and then physical exam. Same standard procedure of inspection, palpitation, percussion and auscultation do not forget to take height, weight, pulse, BP chest measurement during inspiration and expiration, temperature and also examination of neck, thyroid, cervical glands, cervical ribs, salivary glands and TM joint and PR and PV examinations.

Following oropharyngeal problems require due attention.

1. Gingival recession.
2. Caries.
3. Periodontal diseases (if any).
4. Denture ulcer.
5. Denture stomatitis and papillary hyperpasia.
6. Angular cheilosis.
7. Geographic tongue.
8. Candidosis.
9. **Oral malignancies (usually their incidences is as follows:**

Tongue = 52 percent, floor of mouth = 12 percent, palate = 11 percent frequency site is the junction of hard and soft palate. Buccal mucosa = 9 percent, and elsewhere = 16 percent. They are usually squamous cell type of cancer having good prognostic outlook. Some are adenocarcinomatas spread monastically and worst in Kaposi's sarcoma with hemorrhagic points. This has got worst prognosis and radiation therapy is to be chosen. Benign tumors such as mucocele of lower lip or floor of mouth, papillomas, hemangiomas and lymphagiomatas are not uncommon. Laser therapy is proved useful.

SYSTEMIC DISORDERS IN ELDERLY ASSOCIATED WITH DENTISTRY

Cardiac patients: Congenital and acquired disease. SBE after dental manipulations and therefore the antibiotic umbrella is given before and after dental extraction treatment. *The problem of using Adrenalin with local anesthesia requires necessary caution in the patients of hypertension.*

CNS stroke: The problems of dysphasia and speech defect are important situations when the patient is using denture, which is actually functionless. The regime of nasal feeding with Ryle's tube and aspiration of saliva becomes important nursing care till the patient has come to the stage of recovery. *The dentist should be well aware of Asprin and other anti-coagulants before planning for surgical procedure.*

Patients undergoing radiation therapy: Radiation can result in xerostomia and rampant cervical caries, specially when applied to head and neck. The dentists must use topical fluorides and remove

infected teeth before radiation therapy is to be started, otherwise Osteomyelitis and sloughing of alveolar bone may occur.

Diabetic Patients: Continuance of antidiabetic drugs including insulin and antibiotic umbrella is necessary but vigilant watch on blood sugar level as well as urine sugar is required as a safety measure in the elderly.

Patients with parkinsonism: Requires special care in the treatment as well as nursing care continuously. There are special appliances available, which are used by the specially trained nursing staff to carry on for keeping up the nourishment and prevention of accidents.

GUIDELINES ON THE USE OF DRUGS IN THE ELDERLY

Special care needs to be taken while prescribing for the elderly due to the following reasons

It is not unusual for elderly patients to receive multiple drugs for multiple diseases. This results in increased risk of adverse drug reactions and drug interactions.

Manifestations of normal ageing process (e.g. giddiness due to loss of postural stability) are commonly mistaken for the existence of disease leading to in appropriate therapy.

Based on past prescriptions, "**Friendly advice**" from other colleagues, elderly may be already consuming both OTC.

Adverse reactions: Many side effects present themselves in a non-specific manner. Mental confusion, constipation, postural hypotension and falls are common.

Use of hypnotics with long half-life should be avoided; diuretics are over prescribed in the elderly. They should not be used on long-term basis. Blood disorders caused by drug therapy are much more common in the aged. Therefore drugs, which depress bone marrow function, such as cotrimoxazole, mianserin, should not be used unless an acceptable alternative is not possible. Bleeding associated with NSAIDs and aspirin are more common in the elderly.

General guidelines: One should prescribe drugs to the elderly only when absolutely necessary and in lower dosages mentioning the appropriate time before or after food and lower the dose after relif and then stop.

Vitamins and Minarales to be continued as supliment to the nurising limited diet regularly.

Sports Dentistry 24

Developed picture of Sports Culture is evinced in Athens Olympic Mega Festival where more than ten thousand athletes gathered from 202 countries and after a century has come to the same spot from where it had started with all-round Advanced facets of unusual magnitude of National and Global importance and interest.

Next to the cine artists, the sportsmen and athletes are becoming the target of social admiration, interest, and attention. The public madness to be extremely attentive towards cricket matches, and olympic performances cannot be ignored or underestimated. There are bound to be hazardous accidents with possibilities of orofacial traumas and other emergencies to be met by the doctor on spot. Many of them may require attendance of dental surgeon, and sometimes the team of others such as plastic and orthopedic surgeons as well as hospital services for operations, postoperative care, and subsequent physio-therapy, electrotherapy, etc. to reach the functional and cosmetic normacy to the best satisfaction of the patient and the treating team. It has already established the specialty of "sport dentistry" covering the therapeutic and preventive aspects of orofacial injuries of the athletes on field.

THERAPEUTIC ASPECTS OF SPORTS OROFACIAL INJURIES

These injuries maybe simple, superficial and treatable on the spot, or they could be deep, complicated and with profuse bleeding, requiring shifting to the hospital after first aid assistance by a qualified doctor on the spot who should also ring up the hospital about the nature of the injury, condition of the patient, and expected assistance. In a very serious case the doctor should accompany the patient during shifting in the stand by ambulance and for continued help as well as contact with the hospital to mobilize the services without any wastage of time. The mobile phone is a boon on such occasions. It is also necessary to inform the relations immediately explaining them the nature of the accident, its seriousness and the name of the hospital where the patient is shifted. It is also a compulsory practice to inform the police station about it to cover the legal aspect and insurance benefits.

PREVENTIVE ASPECTS OF SPORTS DENTISTRY

The use of mouth guards should be compul-sory for every participant to be checked by

the supervisor in the field. The fitting of mouth-guard is best accomplished by a qualified and experienced dentist. The mouth-guards should cover the teeth of maxillary as well as mandible arches without interfering with breathing and speech. The imprints are not recommended, as they can offer no protection, are bulky and interfere, with breathing and speech. For children type 2 thermally-moldable mouth-guards are recommended because they can be repeatedly altered and the same are used in growing children. The dentists have to pay a special care for the athletes with cleft palate.

The Type 1 Stock Mouth Guards

These are quite popular because they are cheap, and are readily available. They are preformed and can be used directly, but they are least retentive, bulky, and interferes with breathing and speech. They require to keep them in position and therefore they are not recommended. They also do not offer adequate protection and they are better than none.

The Type 2 Mouth Gaurds

These are a bit costly but offer good retention, the varity. Thermoplastic is available and suitable but requires to be fitted by the dentist himself. They are definitely superior to type 1.

The Type 3 Mouth Gaurds

These are custom fabricated definitely superior to types 1 and 2. They are better retained, better adopted, and offer better protection. They are more comfortable and do not interfere with breathing or speech. They requires dentist's help for fitting and are costlier than other types.

PROFESSIONAL ASPECTS OF SPORTS DENTISTRY IN BRIGHT

Ever increasing number of athletes, this specialty has got unlimited scope. More and more dentists are getting involved in this existing field day-by-day and becoming members of "Academy of sport dentistry." There are attempts to include sports dentistry in the regular curriculum of Dental teaching and prepare the professionals to meet the existing challenge.

Emergencies in Dental Practice 25

The word emergency denotes: Sudden juncture demanding immediate action. There is a deep sense of unforeseen, unexpected urgent/serious situation calling for prompt remedial effective action, which requires to be understood, appreciated and enacted properly on predecided lines with full confidence.

Clinically serious emergencies can arise in dental clinic and most of them are associated with systematic disorders.

The practising dentist should essentially know:

a. How to identify them?
b. How to diagnose them?
c. How to manage them promptly and satisfactorily without any waste of valuable time?
d. Mobilize the required kit, equipment, drugs, ancillary staff; and ancillary facilities of outside help in most preplanned ways, directly or indirectly through well-trained staff-members already allotted with specific duties and well practising the planning for emergencies which should be compulsory. Training program with individualized and well set pattern so that there should be no confusion of any sort and performance should be prompt predecided and automatic and as per the test.

EMERGENCY EQUIPMENTS

a. Oxygen (O_2 and CO_2 mixed).
b. Airways and suction pump.
c. IV fluids and set, saline, dextrose, plasma, glucose saline.
d. *Drugs:* Ethyl alcohol, aluminum hydroxide gel, aminophylline for IM or IV use. Ammonia (aromatic amphetamine sulphate 5 mg tab, ammonia nitrate pearls, atropine sulphate, 1 mg. Ampoules, caffeine sodium benzoate 0.5 gm ampoules digitalis preparations tab and ampoules epinephrine ampoules, sodium bicarbonate, sodium penthasol ampoule, calcium gluconate, corticoids, ACTH, antibiotics.
e. *Equipments:* Catheter of various sizes, mouth gags, stomach tube, syringe, tourniquet, kidney trays spirit lamps,
f. *Household materials:* Tea, coffee, biscuits, etc.

TREAT SHOCK

It is a condition of peripheral circulatory failure usually due to lack of blood volume, alteration of cardiac output, loss of peripheral vascular tone or may be due to increased permissibility of peripheral vascular bed called primary shock hindering the blood oxygen supply mechanism in totality.

Prompt Treatment

1. *Body posture:* Head low position.
2. Keep patient warm but not heating.
3. Treat pain by inj morphine, pathedine and other analgesics.
4. Treat anxiety by anxiolytic drugs, injections.
5. Restore blood volume: IV glucose saline, plasma blood adjust the -rate of flow and add NNR and noradrenaline to IV drip to compensate the hypo tension and do not hesitate to add hydro-cortisone orally or ACTH IV treat infection with antibiotics.

Treatment of anemia due to bleeding is essential and for that repeat blood picture and assess the results and replacement therapy by blood transfussions.

Evaluation of Emergency Therapy

Clinically: Constant watch and record of the following:

Temperature, pulse, BP, respiration (TPR) every 15 minutes to 30 minutes.

Cover the stages of :

1. Rapid recoveries.
2. Prolonged recoveries – by close and careful watch.
3. Complete recoveries.

Immediate Diagnostic Measures

History

1. Symptoms and nature of onset.
2. Previous treatment on such occasions if any.
3. History of recent events.
4. History of drugs: Therapy such as insulin, penicillin.
5. If poisoning is suspected obtain all relevant information and materials for analytic lab diagnosis so that antidotes can be planned.

Urgent Investigations after Quick Physical Examination

All the emergencies practically fall in three age groups:

1. Pediatric emergencies (Birth to 18 years of age).
2. Adult emergencies (18 years to 60 years of age).
3. Geriatric emergencies (60 years onwards).

Pediatric Emergencies

A. Medical B. Surgical.

(A) *Pediatric Medical Emergencies:* Shock, coma, convulsions dyspnea, high temperature, Frostbites, insect bite, scorpion bite, snake bite, dog bite, electric shock, burns and drowsing. Many of these are accidental due to negligence and all of these are out side the scope of practising dentist.

(B) *Surgical:* Accidents, injury, burns, and operations.

Emergencies in adults, young men and women signifying the sex difference:

(i) *Medical emergencies in men:* Pertaining to the systematic emergencies under following systems:

- Cardiovascular
- Respiratory
- Digestive including hepatitis
- GU tract
- Endocrine and metabolic disease
- Hematological disease
- CNS and psychiatric
- Locomotion system
- Tropical medical diseases.

(ii) *Medical emergencies in women:* Including the above mentioned 9 systems, the women presents emergencies in sex life that includes prenatal, natal such as:

Pregnancy: Complicating the background of all systems as well as obstractive problems.

Now let us deal with the problem of emergency systematically one-by-one in the following order.

a. Pediatric emergencies both medical and surgical.
b. Adult emergencies both medical and surgical.
c. Geriatric emergencies both medical and surgical.

Pediatric Emergencies

In dental clinic this age group is not uncommon and therefore the efforts.

i. *Medical:* Shock, coma, convulsions, dyspnea, high temperature, frostbites, insect bite, scorpion bite, snake bite, dog bite, electric shock, burns and drowning.
ii. *The Shock:* (See the page No. 207)
iii. The coma and management.
iv. *History:* Look for diabetes, hepatitis, head injury and poisoning.
v. Acetone test of urine look for diabetes, pappilledema by fundoscopy in brain tumors, subdural hemorrhage, lead encephlopathy; fever for infections of (CNS).
vi. For physical examination, see pulses, BP, temperature, fundoscopy, jaundice, bulged-fontanel in infants.
vii. *Investigate urgently:* Urine for sugar, subliming, acetone bile salt and pigment. Blood - BSL, CBS, blood urea, lower and epoxies for acidosis.
LP: See for pressure and analyzing to exclude TB, meningitis, hammertoes vita cranial alums and lead, encephalopathy, brain tumor and meningitis.
viii. *Emergency Treatment:* O_2, free airway, mouth gag or rubber airway; if necessary d-lio if shock is there start glucose saline IV drip and other treatment in the light of results of investigation.

MANAGEMENT OF CONVULSIONS

Clinical Classification

(A) Febrile convulsions (B) Afebrile convulsions

Febrile Convulsion

LP should be done. If normal cell count and blood sugar it can be viral encephalitis (get further information after urine and blood culture tests).

If cell count is increased and the blood sugar is normal or low: it is viral encephalitis.

If cell count is increased and blood sugar low bacterial or fungal meningitis may be considered and usually blood culture is required always get sensitivity test done with culture test to provide us with the choice of substitute therapy.

Management of convulsion: If necessary do complete CNS exam, clinically including fundoscopy and the facility to do LP should be there.

Emergency treatment: O_2, free airways, suction pump, mouth gag to prevent biting of tongue, in of barbiturates 5, 6 to 7 mg/1 kg. IM and repeat after half to one hour if necessary IV injection to be given very slowly 1.5 cc per minute and stopped when relaxation first occurs. Few Whiffs of Ether on a mask for inhalation is helpful in controlling the convulsive state.

Afebrile Convulsions

LP to be done, use antipyretics, and hydrotherapy.

If normal CSF It is due to poisoning or tetanus, alkalosis, allergy, epilepsy, asphyxia, brain abscess or, simond's disease.

If increased pressure, normal or increased proteins
Look for the evidence of pineal shift, calcification, and fracture in the skull to exclude subdural hematoma tumors/abscesses and lead encephalopathy by relevant advanced investigations scanning and MRI, etc. (percent of blood found in CSF decides the possibility of traumatic puncture which also may be kept in the mind).

VARIOUS TYPES OF EMERGENCIES

The Dyspnea

It is due to usually in heart disease, asthma which requires to be verified and physical examination done which done has to rely upon.

On physical examination. The pulmonary bronchi and rales are present. It is asthma, if upper respiratory pathology such a croup.

If heart signs, pulmonary signs or BP abnormalities are present. It can be cardiac asthma, shock, heart attack. Immediate investigations are required under the available facilities for reaching the probable diagnosis and planning the proper treatment.

Hyperpyrexia

In our country the condition of heat exhaustion, heat stroke and sunstroke possibilities should also be kept behind the back of mind when hyperpyrexia hot flush, dry skin, rigid irregular weak pulse are common features. Treatment is based on reducing the temperature and rehydration with slow. IV drip. careful nursing and symptomatic treatment.

Frostbite

By freezing the superficial tissue damage is caused by frostbite. It is assessed in degrees as below.
Fitst degree: Freezing without blisters or peeling of skin.
Second degree: Freezing with blisters and peeling.
Third degree: Freezing with necrosis of skin and deeper bite.

The skin is initially white or yellow and the nearest joint visible. Thereafter, there is edema, blister, and necrosis.

Treatment: No rubbing or massage, local application of mild heat, loosen the dress, keep the environment warm, elevate the affected part, warm slowly use alcoholic drinks and give mild sedation to control the apprehensive state, institute and anticoagulants such as liptasin is indicated. In severe cases amputation may be required.

Drowning and Electric Shock

Immediate resuscitation and cleaning of upper respiratory tract is to be undertaken. It has to be carried out for many hours even in the absence of signs of life. Give O_2 during the procedure. Keep hot water bags near the legs.

IV caffeine and sodium benzoate 5 mg/kg IV drip on initially IM repeat the injection after 30 minutes.

Massaging the feet and legs towards the direction the heart is helpful.

Electric burns are usually small, round or oval. Sharply-demarcated, painless. Sloughing may occur slowly after many weeks and in wider area.

If shock is serious it may cause Coma and sign of ventricular fibrillation or/and respiratory failure which may lead to a fatal end.

Emergency treatment

1. Interrupt the electric current, or close main meter.
2. Give artificial respiration - O_2.
3. Treat the shock, give IV fluids with A C T H.
4. Treat the local wound with antiseptics nursing + Antibiotics injectable.
   In later stages, cardiac arrest is serious and must be kept in the back of mind and treat accordingly and be ready for resuscitation.

Dog Bite

Get the dog identified to health-alternately test its brain for rabies.

Immediately give antirabies vaccine posology in the same for adults and children.

Rabipur (Aventis) given IM preferably in deltoid area for adults and anterolateral area of the thigh muscles in children. (please do not inject in gluteal region).

Post Exposure

Course DO; D3; D7, D14, D30 and D 90

Prophylaxis 3 doses of 1 ml each on 0,28, 56 or in urgent cases if dog is better suspected 0,7, and 21 buster does after one year and between 2 to 5 years.

This is called esser schedule. (Administer Immune solution if necessary). Pregnancy is not a contradiction, shelf life of vaccine is 3 years.

Acute Head Injuries

May be mild or moderate superficial or severe and deep intracranial including fracture of skull and injury to the brain tissue and bleeding and hamatoma. This is the domain of the Neuro-surgeon who investigates by scanning, MRI, X-rays etc. and undertakes urgent corrective surgical procedures. Usually in rare cases there is Coma and physical

exam fails to localize the area of damage and the assistance of the neurosurgeon should be called for immediately.

Burns

May be due to direct exposure to fire and clinically classified the tissues damages as under.

First degree of borns: Erythema without blister.

Second degree of burns: Erythema with blister.

Third degree of burns: Destruction of deeper tissues also classified by extent.

- Area involving less than 15 percent is called minor burn.
- Area involving more than 15 percent is called second and third degree buns.
- Mild responder to local treatment.

Extensive Burns

There is a loss of plasma loss from the burned surface leading to hypoproteinemia with destruction and loss of blood volume and shock that will render pain and give infection in frequent cases.

If burned area is more than 30 percent of body surface area, it is usually fatal but in children 10 percent must be considered for quick decisions.

2nd and 3rd degree burn care requires:

Hospitalization, analgesics, antibiotics, plasma, IV drip treatment of shock, local antiseptics and prevention of contractactures.

The herbal products of Fem care Pharma Aloderm G, Aloderm B have proved scar preventing qualities and with antiseptic and antibodies must be freely used with great advantage as contra cures and keloids can be avoided along with local relief of symptoms.

O_2, catheter tent and avoid pressure dressing and keep the wound open in tent and apply aloderm-G locally 2 to 3 times a day.

Hydrocortisone will help to combat shock and decrease the Toxemia and pain and improve the physical and psychological feeling of well-being, known trained and experienced nursing care is essential for successful outcome and consulate recovery.

Snake Bite

Here we deal with only poisonous snake.

The snake venom may be neurotoxic or hemotoxic. Hemotoxic (Cobra, Eral) causes respiratory paralysis and other haemotoxic (Rat snake, pit viper) causes harmolysis and destruction of endothelial lining of blood vessels. Causing extensive bleeding episodes all over the body.

Sings and symptoms: Local pain, thirst, nausea, vomiting paralysis or hemorrhage treated by aspersion and collapse.

Treatment

1. Keep patient recumbent and quiet.
2. Apply tourniquet above the bite (arterial pulse must be palpable. Cut a deep cross dart at the site of the bite and let it bleed or even apply suction.
3. Infection antivenin IV immediately as well as locally at the bite site.
4. Give full supportive systematic palliative careful treatment till patient recovers completely.

Scorpion, Flee, Fly, Bee and Spider Bites

Locally at the bite site a wheal with central red dot is seen. Patient may be in agony due to severe pain. The local/general allergic response will be seen during allergic fever. It has swelling all over and swelling at the site of the bite. Treatment is symptomatic and supportive:

1. Analgesics, antiallergics, corticoids and antibiotics to prevent the symptoms. If shock start. IV drip of glucose saline with vitamins along with proper nursing which will drag the patient out of the uncomfortable situation.
2. Verbal reassurances and encouragement and diversion will help immensely.

PEDIATRIC SURGICAL EMERGENCIES

There are orofacial injuries, head injuries, fractures of facial bones and skull as well as survical vertebrae, dislocation specially of jaw, sport injuries, open wounds and bleeding.

The standard investigations are always institutional and require modern hospital facilities and specialist or team of specialists such as orthopedic, pediatric, neurosurgeon and dental surgeon along with ancillary supportive treatment by physiotherapist, electrotherapist and occupational specialist to rehabilitate the patient, but the outcome with best efforts is variable. And percentage of recovery is rarely about 100 percent.

The limitations under the circumstances is to manage the patient by possible first aid and transfer him to the proper institution with prior telephonic information and to hasten the required assistance without any waste of time. The practising dentist should never take risk of crossing his limitations at any cost.

However, never to keep the relations ignorant about the seriousness of the situation and probable prognosis although give them courage to work for the best with optimistic outlook and impress upon them that it was the best that could be done under the circumstances.

Emergencies in Adults in Age Group of 18 to 60 Years

While writing this section it is felt that this group covers the majority of clients in dental clinics and the dentist should be mentally and physically well prepared and also have well-trained staff with specified duties give an under the circumstances of emergencies achersal practice programs.

Prevention of Emergencies

1. A telephone usual and mobile telephone must be ready at hand with their number noted.
2. Keep readily available telephone numbers of all concerns to avoid wastage of time in searching for them. Also train the staff to call for them. The Telephone numbers to be recorded in bold and distinct way to avoid confusion and delay.
3. Train the staff to deal with situations to maintain airways, give oxygen inhalation, and help the venepuncture and keep IV. Set ready to give glucose saline.
4. Emergency kit must be ready at hand and check the presence of all the required drugs as per list.
5. Never work alone and always insist upon team work which specifically allotted individual duties.
6. Repeat the rehearsals and procedural training at least once in three months so that the staff remains alert. New members of the staff should be carefully educated and trained.
7. The dental association should regularly visit the dental clinics and notify the inadequacies and deficiencies of equipments and issue a certificate if satisfactory.

Emergencies in Dental Practice

Following are usual emergencies come across in the dental practice:

1. Fainting followed by loss of consciousness.
2. Anesthetic emergencies, respiratory obstruction/arrest.
3. Acute heart attack.
4. Cardiac arrest.
5. Anaphylactic shock.
6. Sudden collapse of patient on corticoid therapy.
7. Stroke.
8. Fits.
9. Asthmatic attack.
10. Drug reaction/interaction.
11. Orofacial injuries.
12. Bleeding uncontrollable (hemorrhage).
13. Inhalation of foreign body.
14. Psychiatric emergencies such as emotional breakdown, uncontrollable maniac outburst.

Fainting

Could be due to over-anxiety, intolerance to pain and longs standing fatigue, fasting or hot atmosphere with high humidity.

Signs and symptoms: Weakness, dizziness, nausea, pallor, hands and feet cold followed by loss of consciousness and mayfall.

Management: Lower the head, loosen the tight clothing, switch on a fan on, open the windows, sprinkle cold water on the face. If necessary, go for immediate investigations for diabetics, heart attacks, anaphylaxis, drug reaction and start the specific treatment in light of positive findings and results of investigations.

Collapse due to uncertain causes

1. Look for pulse, if absent cardiac arrest, requires cardiopulmonary resuscitations immediately.
2. If pulse is palpable and patient is perspiring give sugar/glucose orally and start IV glucose drip as it is hypoglycemia.
3. Concomitantly start oxygen inhalation.
4. IV hydrocortisone 200 mg will be lifesaving in cases of anaphylactic shock.
5. Diabetics are prone to cardiac complications and it is worthwhile to take ECG and if normal, repeat after sometime and even after next day and third day. Although, patient is conscious and looks normal, the coma can be either due to hypo or hyperglycemia and can clinically be differentiated as under.

Hypoglycemia	Hyperglycemia
Rapid onset	Slow Onset
Patient irritable and aggressive	Patient drowsy
skin moist breathing shallow	Skin dry Deep breathing, pulse
BP variable	weak,
but usually high	Hypotension
BSL 1 on below	Blood sugar level high
50 mg percent in	Urine sugar present
incompatable with life	Urine acetone present

Anesthetic Emergencies

A. Respiratory failure.
B. Respiratory obstruction.
C. Anesthetic overdose.
D. Cardiac arrest.
E. Anaphylactic shock.
F. Circulatory failure in the patients undergoing corticosteroid treatment.

Management

1. Stop surgery.
2. Shift the patient in ICU of the hospital for cardiopulmonary resuscitation without any waste of time, although chances of survival are 50:50 even with best care and possible promptness in treatment. The earlier the steps taken better and therefore worthwhile.

Acute Heart Attack

Severe chest pain, pericardial, retrosternal, or upper epigastric indicates acute heart attack. It is usually followed by signs and symptoms of shock and calls for urgent ECG and other lab tests SGPT, alkaline phosphates, etc. A specialist assistance and shifting to the ICU. Unit of the hospital is essential.

Stop surgery and anesthesia forthwith. Give oxygen and nitrous oxide and keep the patient in sitting position with back rest and give glyceryl trinitrate 0.5 mg sublingually promptly. Try to shift the patient if possible in cardiac ambulance with a doctor and trained nurse to ICU.

Cardiac Arrest

The most serious emergency and most difficult to make out in the anesthesia patient, monitor the pulse continuously which will be low, irregular and starts becoming imperceptible and then followed by pallor, respiratory arrest and coma. There will be a systole and ventricular fibrillation on ECG.

Causes of cardiac arrest: Myocardial infraction progressing, hypoxia, anesthetic overdose,

anaphylaxis or severe hypotension. There will be cyanosis and dilation of pupils and the patient becoming unconscious due to cerebral anoxia.

Management: Assistance should be very prompt. Give oxygen, cardiopulmonary resuscitation. If available, use defibrillator. Lay the patient on floor. Clear the airways and start the external cardiac compression continuously till pulse and BP comes up and patient becomes conscious. IV Drip with 100 cc of sodium bicarbonate at the rate of 10 drops per minute. Try to shift the patient to the cardiac unit of the nearest hospital in the cardiac unit with trained doctor and nurses. The prognosis is always unpredictable and grave which should be informed to the relations with due caution.

Anaphylactic Shock

Mostly it is due to allergy, and intolerance to the drugs such as penicillin or other antibiotics, vaccines, foods or even insect bite. This is preventable if the procedure is compulsorily adopted and careful history is taken. Diagnosis is made if the patient complains of etching, numbness with hands and feet cold, pallor, nausea, abdominal discomfort and sometimes vomiting followed by loss of consciousness and cyanosis. Also there is tachycardia, low pulse becoming imperceptible and also urticaria.

Management: Patient is to be kept flat on the floor with feet raised and inject adrenalin 0.5 cc IM, give O_2 inhalation, inject hydrocortisone 200 mg IV slowly 6 hourly and shift the patient for further treatment to the nearest well-equipped hospital. Giving them complete history by telephone for their guidance. If patient is conscious, given anti-allergic by mouth or injection. It is always good to prevent rather than manage after the attack is established.

Sudden Collapse of Patient on Corticosteroid Therapy

It is due to adrenal insufficiency during anesthesia, injury or infection or combination of all these factors together.

Diagnosis: Signs and symptoms of shock are present along with pallor, techycardia, rapidly falling BP and drowsiness followed by unconsciousness.

Immediate management

Lay the patient flat on the floor and raise the feet. Clean airways inject 200 mg hydrocortizon IV. Start O_2. Simultaneously attend the source of collapse such as stop surgery anesthesia and inject antibiotics if there is infection or not.

After immediate management shift the patient to the hospital informing them about the patient and treatment given telephonically. Also keep the relations informed about the seriousness as well as about the name, address and telephone No. of the hospital where the patient is being shifted.

Stroke

The patient is usually hypertensives, diabetic and may complain of weakness in the arm leg and on one side of the face and body. Please take cognisance and postpone the treatment till the patient gets fitness certificate from the neuro-physician.

With all this, if patient gets an attack of stroke while on the dental chair, he should be immediately shifted to the nearest well equipped hospital under due information to the relations without waste of time.

Till then the necessary first aid treatment such as prevention of tongue bite, convulsions, etc. may be given while the patient is being shifted to the hospital in ambulance with a doctor and trained nurse. But do not forget to inform the relations giving them all the details cautiously.

Fits

Please verify if the patient is epileptic. If the patient is female, ask whether she is in periods, look for drugs being consumed and also whether the patient has consumed alcohol. After convulsions, epileptic patient may become unconscious wait till he comes out of that stage. See that the patient does not damage himself by biting his tongue or falling and sustaining injuries. It is always safe to give 20 mg diazepam IV and guard him well by strong attendants. Clean the airways, start oxygen and shift the patient to the nearest hospital with due precautions and responsibilities of informing the hospital authorities and the relations.

Asthmatic Attack

History always reveals the asthmatic tendency but it is usually the precipitating factor to be looked for, which are anxiety, infection or allergy.

There is always dyspnea initially; bronchi and wheeze, which become low when breathing, become shallow. Accessory respiratory muscles are in action and there is tachycardia, cyanosis followed by drowsiness.

Management: Keep the patient in sitting position with backrest. Start O_2 and anti-asthmatic drugs such as hydrocortisone 200 mg IV adrenalin 0.5 cc sc and use nebulizer if available. Give injection aminophyllin 0.25 gm diluted IV slowly.

It is always safe to shift the patient to the hospital under due intimation to the authorities and relations of the patient as a compulsory routine.

Reaction and Inter-reaction of the Drugs

This is a very important aspect, which should be taken seriously and dealt promptly. It could be anaphylaxis and shock. It could be due to overdose of barbiturates. Occasionally pethidines, anti-hypertensives drugs or the local anesthesia showing intolerance.

Signs and symptoms: Possible effect includes agitation, confusion, drowsiness followed by fits or unconsciousness.

Management: Lay the patient flat. clear airways, start O_2, stop anesthesia and drugs. Treat any cardiac or pulmonary complication and try to shift the patient to the nearest hospital under specialist treatment giving the full history of the treatment given.

Orofacial Injuries

Therapeutic and preventive aspects are already dealt with in Sport Dentistry please refer page No 205.

Hemorrhage

Local cause of bleeding is usually due to teeth extractions when excessive bleeding worries the patient it may be due to orofacial injury. Most of these cases are treatable by careful handling after due investigations.

Management

1. Reassure the patient firmly.
2. Ask fussy relations to sit out.
3. Clean the mouth and locate the bleeding spot and apply artriforceps and ligate. If needed cauterize under local anesthesia.
4. If the bleeding is persistent, enquire the patient about the past history and also family history and admit the patient to the nearest hospital for hematological tests and fresh blood transfusion.
5. Injection of tranexamic acid 500 mg. In 5 cc of distilled water IV may give interim relief. Other hemostatic drugs may also be tried. But do not delay in transferring the patient to the hospital.

Inhalation of Foreign Bodies

This is not uncommon. If the foreign body is present inside the epiglottis forceful cough can be tried

preferably with snuff in the nose or cotton fibers in the nostril.

If it is swallowed, and has gone into the esophagus then vomiting may be provoked and preserve the content in the kidney tray and look for the foreign body.

If the foreign body has gone in the bronchi refer the patient to the hospital under the care of chest surgeon for bronchoscopy and removal of foreign body after X-ray and MRI investigations.

Psychiatric Emergencies

In these cases, one requires to look into the underlying disorders due to:

1. Severe pain or discomfort.
2. Infection specially in children or elder.
3. Drugs such as barbiturates, alcohol, addictions and their withdrawals or corticoids overuse or withdrawal.
4. Hypoglycemia in diabetics.
5. Temporal lobe epilepsy.
6. Intracranial tumors.
7. Tuberculoma.
8. Cysticercosis.

Management: The assistance of psychiatrist or neurophysician to be called for..Lab check for blood sugar level to be done urgently to exclude diabetics.

Avoid sedation, which may confuse the diagnosis.

If the patient is violent and uncontrollable take police assistance and adequate precautions during the shifting of patient to the hospital.

Main thing in the confidence of the treating dentist in ordering the trained staff to do the jobs simultaneous promptly and render the necessary treatment, promptly and assist for shifting the patiant to the suitable nearest hospital with due care.

Use of Lasers in Dental Practice 26

The ward LASER is an acronym for "Light Amlification by Stimulated Emission of Radation." It appears as an intense and narrow beam of uni-colored light of various waves. Lengths delivering the light energy to the target site. The dental lasers have long narrow tubing and can easily be used in narrow confines.

A miraculous therapeutic modality that has brought a new horizon and a new ray of hope in giving the relief to the dental patients is the laser therapy. The latest dental laser offers painless dental care and drill free dental treatment such as fillings, crowns, veneer, bridge. It is noteworthy that the dental laser can prepare many types of fillings without having any touch with the tissue. The laser truly saw their first use in 1960 in clinical dental surgery.

practice and CO_2, ND: YAG in soft and hard tissue procedures because it offered to seal blood vessels and lymphatics causing minimal bleeding and postoperative edema. Lasers offer negotiating curves and folds in oral cavity and provide a remarkable surgical convenience demonstrated when they vaporize, coagulate or cut tissue. The pain is reduced by 90 percent due to sealing of nerve fibers.

Types of Laser

Following lasers have appeared on fore-front through research.

1. CO_2
2. Nd:YAG
3. Er:YAG
4. HO:YAG
5. ArF: eximer
6. Xet: eximer
7. Argon ion
8. KTP
9. Ruby
10. ErYSGG.

Low level laser therapy (LLLT) can be effectively used in dental distress syndrome, which previously was mainly used to treat herpes simplex labialism.

Now the laser usage scope has widened and it is being used in cosmetic dental surgery, teeth whitening and bleeching control, bright smile, gum re-contouring, halitosis, in the formation of veneers, crowns and bridges.

The argon laser is proved to be an invaluable surgical tool which can cut, vaporize, and coagulate blood instant-aneously with its predictable role which is self evident well recognized and serve as a dependable tool in surgical practice including dentistry.

Carbon dioxide lasers are being used effectively and confidently in various intraoral lesions even in hemorrhagic disorders such as hemophilia, idiopathic throbocytopenic purpura, etc. Although the need of fresh blood transfusion is necessity it should not be overlooked or underestimated but requires to be considered as complementary and double safety measure.

The holinium laser is being confidently used in exitional biopsy sample of good quality. At the time ND:YAG laser is considered to be safer and best specially of hemangiomas where no postoperative bleeding takes place on one hand and the biopsy specimen is perfect on the other.

Modalities of Laser Therapy

In the following situations the laser therapy in dentistary is the modality of choice:

1. Local bleeding episodes to be controlled in oropharyngeal region even in hemorrhagic disorders where blood loss and pain is minimum or absent. The cost factor is also coming within the range of affordability even for the patients of middle class.
2. Preprosthetic surgery: Used and these for removal of inflammatory papillary hyperphasia the lasers are used and these super alternatives to the conventional modalities. It negotiates curves and folds includes no bleeding, minimal pain and swelling where mostly CO_2 laser is used.
3. Malignant tumors exision.
4. Coagulation of the intraoral bleeding spots/areas.
5. Biopsies.
6. To treat aphthous ulcers.
7. Herpetic lesions.

ADVANTAGES OF LASER THERAPY

a. It provides dry operating field.
b. With excellent visibility.
c. The scarring is minimal.
d. Sutures are rarely needed.
e. They sterilize the field and thus limits the antibiotic use to minimum.

Optical drilling may not be replaced "by the conventional drill" unless there is heat releated strctures around damageable by laser therapy. The damage to the surrounding tissues could be reduced dramatically by new laser system. Today more than ten different laser types are used in dental practice as mentioned above. Their optical properties and tissue interaction, chemical, thermal and mechanical effects, wavelength in nm.

Pulsed/cw, power/energy as well as delivery systems and their limiting factors are within the purview of well established speciality teachers, and training educational programs well before they get global eligibility of usage in dental clinical practice.

The laser education and training programs to dentists and to the auxiliary staff are essential through regular diploma courses in order to keep up with advancement of scientific dental practice.

Laser Safety in Dental Practice

Regulations, safety standards and guidelines are already laid down and well established globally for dentists and auxiliary paramedical staff.

According to Dr NJ. BUT (PDRC) the post-laser healing is slightly slower because the laser seals the blood vessels also. Sealing of nerve endings makes the operation painless. Therefore its use in TMJ syndrome is considered safe and useful.

The years ahead promise to bring many new, exciting, opportunities and challenges to comply with the needs and demands. "The Patient Empowerment", new expectations of evidence based, safe, cost-beneficial care and preplanning of the treatment, are the shadows of public Expectations and we have to safeguard the ideal of "Saving and Preserving" rather than repeatedly restoring teeth indefinitely. However, the change has been and is always an inevitable everlasting phenomenon, a sign of progress in developmental process is positive and promising to the patients and the dentists.

Computers in Clinical Dental Practice 27

The computers are affecting our lives in one-way or other. We are outdated without the knowledge of computer. The list for using computer is almost endless. They enhance our *speed, accuracy, memory, diligency and reliability* to unimaginable extent. Thus they change the entire outlook of our working capacity and dimensions for overwhelming success much beyond our estimates and expectations.

Following avenues are relevant:

a. Keeping record of dental patients.
b. Presentations of charting system.
c. Video-imaging system using intraoral cameras.
d. Image editing in cosmetic dentistry.
e. Mandible movement analysis.
f. Radiographic imaging, CT-scan, films transfer.
g. CAD/CAM.
h. Correspondence

All these and more and more aspects will come in the preview of use of computer in dentistry and computer will be considered as an essential requirement for modern dental practice. The modern computer-science will promote the avenues of using the artificial intelligence techniques in order to solve the problems of decision making, in the field of diagnosis, treatment, and planning as well as prevention.

It is beyond doubt that the help of computer will be taken as a routine by incoming generations of dental practioners although at present they are severely hampered due to inadequate computer education/training and practice.

The advanced methods of informative and computer based interactive multimedia technology as well as computer interface techniques will be every day requirement for busy practitioners. In cosmetic dentistry the computer will show the pre and post-operative remarkable change in color, shape, form, and arrangement of teeth and help the patients to visualize the total effect in full facial appearance and close up and improvement of smile in already operated cases on computer tape and get rid of doubts and fears before giving consent for the operative procedure to be adopted by the dentist in his case. For instance he will be able to assess whether the teeth will look too long, too short, too wide or too narrow. This will result in to his positive outlook and full cooperation. The printouts of these esthetic transformations can be a good source of inspiration and motivation for other patients with similar problems.

More than any thing else the patiant in the process of diagnosis and plan of treatment at

the try-in stage establishes more trust and confidence in the clinician. The apprehensions of patients are certainly minimized by this process of imaging.

In a few cases the dimensions of plastic/orthognathic surgery may invade and give explanation to the patient and then with his consent the dentist has to take the decision.

It is always necessary to make the corrections after seeing both close-up and full-facial views. This is the most sophisticated way of selling the idea of treatment. It has become now an integral and important part of a patient's consultation process.

Clinicians should know "what can" and "what cannot" be reasonably accomplished. It is always best to show the patient a result that is slightly less esthetic than what the dentist feels can be obtained.

Bleaching, bonding, laminating or crowning can also be used to preview the results. A distinct advantage of imaging is that the proposed restoration can be altered as necessary before actually preparing the tooth.

The insurance acceptance: Imaging helps substantially in the insurance acceptance of the cost for proposed treatment where only radiographs are insufficient to convince the authorities.

The video cassetes tapped by TV camera: Intraoral and extraoral TV cameras for dental procedures are being used successfully, which has significantly improved the practice-outlook. These are purchased and shown to others. This is also considered as a reliable and acceptable legal evidence by the judiciary. Further progress of CAD/CAM. System in Japan and other countries assures us the advanced avenues of critical analysis of systems.

Scenario of work-stations: The diagnostic fast developing work-stations will definitely have an impact on the practitioner's performance subject to his mental acceptance, adptability, and readiness for computer education with interest.

It is well known that the dentists are abnormally slow to adopt new ideas and partly it may be justifiable to a certain extent that the workstations are revolutionary, costly and fast changing leading towards implantology. No one can ignore the momentum of changing times. But the future is very bright provided the outlook is positive and attitude is lively.

Finally we have to conclude that the dentist without computer maybe considered outdated, retrogressive, and mediocre in avoiding the computer technology a most useful modality, which is affordable and easily available.

The latest slogan “you are not fully literate untill you learn computer” is true and valid for all the doctors including the practising dentist.

Preventive Dentistry 28

The present strategy is to provide internal package of essential health care including dental care to the most vulnerable section of special risk group of the society. The mother and child is unit comprising 70 percent of the population facing the highest mortality rate and therefore, labeled as "High-risk" group of the society.

The prevention spectrum covers the wide scenario or aspects roughly listed below: Care for mother antenatal, natal and post- natal for reasonable periods.

PREVENTIVE PEDIATRICS: GENERAL AND DENTAL

Our area of discussion here limits only to preventive dentistry, and we consider mother as in-charge of child and also responsible for preventing dental problems in growing children and therefore, required to be well-informed, trained for successful implementation of preventive procedures regularly and also to supervise the routine as well as contact the family dentist when needed at the earliest to prevent the dental damage and rigidly following the dental appointments and supervise the installation of the treatment prescribed by the dentist.

The pediatric group includes normal children; physically handicapped, mentally-retarded and socially-maladjusted requiring separate programming in each category and also with care for the dental problems of aged and senior citizens.

Disasters and hazards require emergency management as discussed under the pediatric dental emergencies. At the same time, occupational health care also includes dental health care. Genetics and health is a new opening for genetic engineering and this unconquered area now seems to be within the range of positive possibility. Mental health including mental under development, mental morbidity covering individual and social aspects requires to be given adequate attention and importance during planning of community health program and health education as well as dental treatment.

The World Health Organizations

The World Health Organization (WHO) is at work through its agencies such as –

1. UNICEF (United Nations International Children's Emergency Fund).
2. UNDP (United National Development Program).
3. UNFPA (United Nations Fund for Population Activities).
4. FAO (Food and Agriculture Organization).
5. ILO (International Labour Organization).

6. USAID (United States Agency for International Development).
7. Colombo Plan.
8. CARE (Cooperative Assistance and Relief Emergency).
9. World Bank.
10. SIDA (Swedish International Development Agency).
11. DANIDA (Denmark National Development Agency).
12. Rockefeller Foundation.
13. Ford Foundation.
14. International Red Cross.
15. Indian Red Cross.
16. The Junior Red Cross for Village Uplift.

Definition of Health by WHO (1948)

"Health is a state of complete physical, mental and social wellbeing and not merely an absence of disease or infirmity."

New Philosophy Added:

1. Health is a fundamental human right.
2. Health includes the ability to lead a socially and economically productive life.
3. Health is intersect oral.
4. Health is an integral part of development.
5. Health guarantees the quality of life.
6. Health involves individual, state and global responsibility.
7. Health maintenance is a major social investment and proper percentage of total budget to the allotted for the same.
8. Health is a global aim.
9. Health also covers the added dimensions such as spiritual, emotional, vocational, political and industrial.

External and Internal Factors which Influence Health

1. Heredity.
2. Environment.
3. Lifestyle.
4. Socioeconomic local conditions.
5. Community traditions.
6. Unforeseen calamities such as earthquake, war, floods, etc.

EPIDEMIOLOGY

The branch of medical science which treats and deals with epidemics of infectious diseases in the population covering all its aspects and assesses the mortality, morbidity, disability and natality (Birth –rate) and its control.

Spectrum of Dental Diseases

1. Dental caries.
2. Periodontal diseases caused by micro-organism.
3. Acquired dental diseases such as tumors, cancers, etc.
4. Hereditary and congenital such as cleft palate and other syndromes.

Primary Preventive Dental Services

1. Community water fluoridation.
2. School water fluoridation.
3. Fluoride supplement program.
4. Fluoride mouth rinse program.
5. School sealant: mostly effective for preventing pits and fissures in caries.
6. Salt fluoridation.

Primary Preventive Services Provided by Dental Profession

1. Topical fluoride application.
2. Pit and Fissure sealants.
3. Diet counseling.
4. Plaque control and treatment of dental pathology.
5. Oral hygiene education, training and implementation.
6. Dental caries and activity tests and treatment.
7. Dental camps in rural villages, schools, factories etc. along with audiovisual programmers.

Topical fluoride application: Fluorides are applied locally to erupted tooth surfaces to prevent the

dental caries in the form of fluoride rinses, dentifrices, pastes, gels and solutions.

The solution of 2 percent sodium fluoride or 8 percent stannous fluoride solution are acidulated buffered solution of fluoride called APF containing 1.23 percent of fluoride ion.

The caries inhalation by these topical applications approximately 30 percent available forms.

1. Sodium Fluoride (NaF) It is available in either powder or liquid form. Dissolving 0.2 gm powder into 10 cc of distilled water forms 20 percent solution. It is also available commercially.

2. Stannous Fluoride (SNF2) It is available in powder form either in bulk containers or pre-weighed capsules. The recommended and approved concentration is 8 percent. It is obtained by dissolving 0.8 gm of powder into 10 cc of distilled water. This combination is not stable and therefore required to be prepared just before application.

3. Acidulated Phosphate Fluoride (APF) This preparation is available in the form of solution or gel. Both are stable forms and contain 1.23 percent fluoride. The gel preparations contain thickening/flavoring/coloring agents.

Another forms of APF gel are thixotropic gels. It actually behaves like solution. It is more easily forced into the inter dental spaces than the conventional gels if applied by pressure.

4. Application Frequency

i. Four applications provided at weekly intervals in the age group of 3, 7, 10 and 13 years selected due to teeth eruption pattern. This method is preferable.
ii. Another method of longer intervals, keeping 3 to 6 months' gap between the individual applications.
iii. For applications of stannous fluorides (AFP) it can be applied as a single application after 6 to 12 months' intervals.
iv. Regardless of the type of solutions or age, a patient of active caries should be given an initial series of topical fluoride applications within the period of 2 to 4 weeks followed by an application at the interval of 3, 6 and 12 months.

5. Fluoride Varnishes: It is convenient to use in young children. They remain in contact with teeth for longer periods as compared with other solutions and gels although the method of application is the same.

FL Varnishes are Duraphat and fluorparotuor.

Pits or fssures sealants: Sealant is a dental resin that firmly bounds the enamel surface and isolates the caries producing condition where fluorides fail.

Material used:

1. Bis–GMA that is a sealant of choice.

Flouride dietary supplements are also recommended in FL defferent defferent areas.

Diet counseling: Avoid sugar, sticky sweets such as chocolates, which are potentially carcinogenic and rinse the mouth well after each meal. Avoid snacks, ice-cream, tea, and coffee in between the meals as far as possible. Avoid carcinogenic stuff in meals and brush the teeth after each meal and also at bed times.

Plaque control: Removal of microbial plaques and prevention of its accumulation at the root of the teeth adjacent to gingival surfaces require to be removed by the dentist to control the dental hygiene and prevent the periodontal diseases.

Patient is to be trained and warned for continual maintenance of the dental hygiene regularly. The bacteria present in the dental plaques cause dental caries.

Plaque control program can be achieved by:-

1. Regular toothbrushing in the morning and at bed times at night.

2. Interdental cleaning by using interdental brush.
3. Oral irrigation rinsing and using antiseptic agents.
4. The toothbrushes are used in four basic motions, viz. horizontal, vertical sweeping, rotatory and vibratory.

Action of brush can exhibit play, skip, slap, bunching, pulsing and vibratory.

The powered toothbrushes are generally electrically operated on chargeable batteries. The head of the electric brush is smaller and changeable. They are most useful for physically handicapped, mentally retarded and old aged persons and children when parents have to brush the teeth. For those patients who have got paralysis or who are poorly motivated rather psychiatric patients.

Dentifrice

They are tooth powders, toothpastes, liquids and gels. They are useful in removing extrinsic stains and infection.

Intradental Cleaning Aids

The usual toothbrushes do not completely remove the intradental plaques and, therefore, the following methods are adopted:

1. Use linear intradental brush.
2. Dental floss.
3. Use of dental floss holder.
4. Use of interdental lip tip stimulator.
5. Use of interdental wedge stimulator.
5. Use of tooth picks and tooth pick holders.
6. Use of swab tips.
7. Use of tongue cleaners.

Oral hygene, education, training and implementation

1. *Oral Irrigation Devices:* These devices work by directing high-pressure stem of water through a nozzle to the teeth surface. A pump or other device generates the pressure. This pressure cleans the non-adherent bacteria and debris of the food particles more effectively than toothbrush. It cleans the inaccessible regions of intradental areas and periodental pockets.

2. *Chemical Inhibitors of Plaque:* Two agents are important and are in use.

i. Chlorhexidine mouthwash.
ii. Essential oil or phenol mouthwash.

Some other agents have been found in the markets. They are stannous fluorides, acetyl pyridine chloride, sanguinarine iodine, benzydamine.

3. Disclosing agents:

A. Type-I Solutions
B. Type-II Wafers

These stain the bacterial deposit blue or pink and prove to be an excellent oral hygiene aids. Thus, their presence is disclosed by other removal exercises by your treating dentist.

Dental caries activity tests: It denotes high-risk group identify them and provide data about the status of microorganisms in oral cavity and preventive methods that can be meaningfully used and a vigilant watch kept on the progress.

The test include:

a. Lactobacilli colony count.
b. Calorimetric Snyder's test.
c. Alper's test.
d. Methyl red test.
e. Salivary reductase test.
f. Enamel solubility test.
g. The swab test.
h. Enamel susceptibility test.

Self-applied topical fluoride products

1. Fluoride gels.
2. Fluoride mouth rinser.

Dental camps: About 80 percent of population in India lives in villages. No community project is complete unless the villagers are attended by the professionals in a most acceptable and popular way. My own experience, is to have a audiovisual round with most entertaining popular pictures which are usually well attended and inbetween the picture, the education cassettes to be shown. It may

be announced during and after the picture show that the mobile well-equipped a dental van will attend the dental patients next morning. This dental van has got dental chair and all other required instruments to give real help to the dental patients. Same type of camps are also taken in Ashram schools, in tribal zone and the response is quite encouraging. Many commercial companies have come forward to give toothpaste and toothbrushes as free sample, which adds glamour to the function. This has to be done as part of free medicosocial services with planned well-prepared and with adequate support from primary Health Centers, Gram Panchayats, Zilla Parishads, Public Health Dept. and Tribal Welfare Dept. because all these contribute to the economic and moral assistance as well as full co-operation required and local guidance for the success of the event. Similar camps are necessary in municipal schools, factories, orphanges, hut-ment areas, jails, etc. and it is seen everywhere the services are respected, honored and welcomed. There is an actual need for effective dental health education and service Programs. Audiovisual methods are effective for dental health education, which are required to be accomplished in a planned manner. If possible, the prior survey of the area and contents with all concerned is to be done by a team of experts of voluntary charitable organization, so that it will give an idea to supply adequately the required material for the activity. The dental problems are broadly divided into two categories - (A) Treatable and curable. (B) Incurable such as cancer, fractures and dislocations that may require advance surgery in the hospital and subsequent treatment and follow-up. The incurable problems met during dental health camps include cancer, tumors, cysts, etc. There should be an arrangement to shift the patients with attendant to the institution and bring them back to their home after the treatment. The daily wage population cannot afford this venture and therefore, there should be provision to support them economically. Most of the illiterate village population cannot read the literature and to them the audiovisual dental health education is the only alternative.

All the records of the patient treated will provide the data for research. The school dental health education is the most important because it provides the most vulnerable section of the community. It is worthwhile to inspect the clinics and provide them with dental preventive materials adequately and train them how to use it. Inspect their activity with intervals and replace the materials required. Under that category, the following programs should be arranged in the schools.

a. Toothbrushing Program.
b. Fluoride Mouth Rinse Program.
c. Fluoride Tablet Program.
d. School Water Fluoridation Program
e. Dietary counseling
f. Selection of students requiring dental treatment to be referred to the appointed dentist.

The supervision of implementations of these programs is left to the dentist attached to the school. The school report sent to the parents must contain the report about the dental conditions and also required care and advice which parents are supposed to undertake.

The school curriculum should contain a chapter on dental care and questions on it in the exam should be compulsory.

The Dentist Act of India

The Dentist Act 1948 passed in the Indian Parliament.

The Indian Dental Association (IDA) was formed in 1949, which was registered in Delhi in 1967 with registration No. S/265.

The Dental Council of India (DCI) on 12th April 1949 as per the Dentist Act of 1948.

Glimpses of Tropical Diseases 29

ETIOLOGICAL AGENTS

The countries that fall in the tropical zone, i.e, 23 degree to 27 degree north and south of the equator, have got materially different problems from those encountered elsewhere. *They are grouped according to etiological agents in the following order with shortest essential information.*

1. Protozoa, e.g. malaria amebiasis, visceral leishmaniasis (kala azar), African trypanosomiasis (sleeping sickness)
2. Bacteria, e.g. leprosy, cholera, anthrax, plague.
3. Spirochaetes, e.g. yaws, relapsing fever, and spirillum, i.e. rat-bite fever.
4. Viruses, e.g. yellow fever, dengue, rabies.
5. *Chlamydia*, e.g. lymphogranuloma inguinale, trachoma.
6. Rickettsiae, e.g. typhus fevers, Q fever.
7. Helminthes.
   a. Flukes, e.g. schistosomiasis.
   b. Tapeworms, e.g. hydatid disease, roundworms, e.g. threadworms, ascariasis, hookworms, filariae,
8. Fungi, e.g. histoplasmosis.
9. Arthropods, e.g. scabies.
10. Snakes and marine animals, e.g. adders, jelly fish.
11. Vegetable toxins, e.g. argemone poisoning.
12. Exposure to strong sunlight causes heat exhaustion, and heat strokes, sun strokes.

1. Protozoa

Malaria

Malaria is due to infection by *plasmodium falciparum*, *P. vivax*, *P. ovale* and *P. malariae*. Infection is acquired through female anophelise mosquitoes if it is infected by sucking the blood of other patients. The cycle of parasite in man as well as mosquitoes is well known. The clinical syndrome is fever with chill (rigors). In case of *falciparum* the fever is high and more or less continuous while in *vivax* it comes in alternate days and in *ovale* and malerial every four days. The cycle in human beings takes place in red blood corpuscles. The malarial parasites persist in the liver and may later cause relapses. The *falciparum* malaria is dangerous therefore called malignant because it can cause celebral malaria, black water fever due to severe hemolysis. There is severe anemia, weakness, headache, vomiting, bodyache, and in case of cerebral malaria, drowsiness and even unconsciousness. There is splenomegaly and hepatomegaly.

Diagnosis

The malarial parasites can be seen in the blood pictures and diagnosis is confirmed.

Treatment

Malaria is a treatable disease and the drug of choice is chloroquine. 600 mg to start with and followed with 300 mg 6 hourly. There after when the disease is controlled 150 mg twice a day for 3 to 7 days. In case of malignant malaria the patients vomits, and if unconscious the injection therapy has to be given. Either quinine dihydrochloride 650 mg inj IV. In black water fever there is sever anemia the blood transfusion maybe necessary while corticosteroids are of value in preventing further hemolysis. Good general treatment, careful nursing, foods by mouth or by inj and IV infusions are necessary. There are always dangers, which are required to be prevented.

Prevention is undertaken by mosquito control spraying the house with DDT and also prevention of the accumulated water around mosquitoes do not breed in seawater.

Amebiasis

It is due to infection of *Entamoeba histolytica*. It is propagated by patients excreting cysts in the stools and contaminating food or water which is subsequently used by others. After infections the IP is 2 weeks and the cysts become trophozoites the vegetative forms in the collen and start diarrhea mucus in blood stools with spasmodic pains called griping or tenesmus. Cysts are passed in the stools when the disease is inactive. This syndrome called amebic dysentery. One of the complications is hepatic amebiasis, when the patient gets sweating, enlarge and tender liver and pain in the right shoulder which is quite characteristic.

The response to emetine injections and metronidazole and chloroquine is rapid and helpful. The large liver abscess requires to be aspirated. Treatment is symptomatic and early use of specific drugs mentioned above can control the disease.

Giardiasis

The infection is worldwide but more common in tropics. There is a recurrent attack of diarrhea abdominal pain, discomfort, lethargy, flatulence, abdominal distention, nausea and vomiting. It can be successfully treated by metronidazole 2 gm as a single dose daily after breakfast for 3 days and the course maybe repeated after weeks.

Leishmaniasis (Kala azar)

It is conveyed to man by female Sandi flies. The Leishman-Donovan bodies are found in the reticuloendothelial cells in oval forms. The leishmaniasis affects liver, spleen and there is a great increase in gamma globulin. Clinically the IP period is 1 to 2 months. The onset is insidious with a low fever sweating. The fever shows double rise of temp in 48 hours. There is an enlargement of spleen and liver. The skin shows nodular eruption specially on the face and therefore it is called kala azar.

Diagnosis is confirmed by examination of smears from bone marrow, lymph nodes, spleen or liver. The treatment is injections of tavalent antimony compound solutions 100 mg per ml given IV or IM a suitable course of treatment is required. The total dose is 12 to 18 gm. The results are encouraging and the disease can be controlled and almost cured.

Trypanosomiasis (Sleeping Sickness)

These diseases are common in Africa. It produces fever, enlargement of glands, confusion, change of behavior, and sleeping rhythm. The patient sleeps at daytime and suffers from insomnia at night. The symptoms look like viruses encephalitis. The trypanosoma are detected in blood film.

Treatment

Suramin is given IV 200 mg to 1 gm on test dose then dissolved 10 cc of water and repeated at the interval of 3 to 5 days to total dose of 5 to 10 gm. Other drugs are also available such as pentamidine, berenin, metarsoprol and nitrofurazone but they are in less use due to side effects.

2. Bacteria

Leprosy

Leprosy is caused by *Mycobacterium leprae*. It is one of the most seriously disabling disease and it is estimated that there are about 20 million people suffering from leprosy in the world. Following clinical forms are seen in practice.

1. Neural leprosy.
2. Lepromatous leprosy.
3. Tuberculoid leprosy.

In neural leprosy there is depigmented patch on the skin with loss of sensation.

In lepromatous leprosy there are nodules on face, hands and on the feets.

The tuberculoid leprosy has got few solitary lesions in the skin and peripheral nerves. The lesions are hypopigmented in dark skins, often scaly. Because of loss of sensation there is trauma due to friction, pressure and gradual loss of the fingers and toes and the patient becomes disabled. It may even affect the eyes and cause blindness.

Diagnosis is confirmed by skin biopsy.

Treatment

Dapsone is given by mouth, Other drugs are thiambutosine and rifampicin.The results are quite encouraging if administered in the early stage of disease. The deformities are corrected by surgery.

Cholera

Cholera is an acute disease due to *Vibrio cholerae* spread by contamination of water. Three serotypes are famous inaba, ogawa, hykojima. Certain areas in Kolkata near Hooghly river are endemic. Cholera is present all round the year. The bacteria disappear from the stools of the patient within a week.

Clinical Features

An incubation period of few hours to five days. The patient suffers from severe diarrhea and vomiting which starts suddenly. There is no nausea and the vomit is copious. Diarrhea is similar to "rice water" stools. In severe cases, almost fluid and electrolytes loss is accompanied which soon leads to intense dehydration and agonizing muscular cramps. The skin becomes cold, clammy and wrinkled and the eyes get shrunken. Blood pressure falls. the pulse becomes imperceptible and urine is scanty. Unless the fluid is replaced, the patient dies within few hours. If fluids and electrolytes are replaced the improvement is rapid. There could be mild cases with mild symptoms. Mortality is very high in children. They may show convulsions, tetany and symptoms of hypoglycemia**.** *The complications of pulmonary edema due to quick fluid replacement should not be overlooked*.

Diagnosis

Vibrio cholerae are identified on film of stools under microscope and also by culture.

Treatment

Because of severe vomiting nothing is possibly tolerated by mouth and therefore, intravenous drip of glucose saline is life saving. Vitamins are to be added. When vomit stops patient should be advised to drink glucose saline water about 500 cc per hour. The treatment is tetracycline 250 mg by mouth six hourly or by injection. Sulpha preparations furazolidine has got a curative role. General treatment is very important. *The clothes of the patients should be dipped in the antiseptics before washing so that the disease does not spread*.

Anthrax

This is called wool Sorter's disease. Because the spores of Bacillus anthracis are present in the wool and are inhaled by the wool sorters and causes the pulmonary infection. It is an occupational disease of farmers, butchers, dealers in hides, animal hair and wool handlers. Primary legions in man can be seen in the skin, pharynx, larynx, lungs and intestinal tracts going through the lymphatics and causing bacterima and affects spleen, lungs, meninges and brain.

Clinical Features

IP is 1 to 3 days. On the skin it maybe a papule. It is a painless lesion. Causes enlargement of the lymph gland and thereafter, spread of the disease. By inhalation, the antharax developes a virulent hemorrhagic bronchopneumonia. It may also be present as meningitis.

Diagnosis

A stain smear of sputum shows the bacteria and the diagnosis is confirmed.

Treatment

These bacteria are suceptable to penicillin, teramycine, streptomycin and should be given urgently. If necessary IV.

Prevention

The dead cattle should be buried deeply so that the wolf does not dig and eat and spread the spores in the grass. *Anthrax vaccine can protect the laboratory workers and also people dealing with wool and hides*.

Plague

Plague is a serious disease caused by *Bacillus pestis* that has got three clinical varieties.

1. Bubonic plague.
2. Septicemic plague.
3. Pneumonic plague.

The bubonic plague is due to bites of the infected fleas from infected rodents, rats and in case of bubonic the nearest lymph gland is swollen and there is high fever, severe toxemia and death.

In case of septicemic plague, the bubo may not be present and the infected material through the bite of flea goes into blood circulation directly and causes high fever, severe septicemia, toxemia, hemorrhages and death. Even meningial hemorrhages are seen. The incubation period is 3 to 7 days but few hours in case of pneumonic plague.

The pneumonic plague is most dangerous as the infection is through inhalation and within an hour there are pneumonic changes, high fever, toxemia, dyspnea and death. The patient can infect the others through the droplet infection via respiratory channel.

Diagnosis

The bacteria are present in the circulating blood and can be seen under microscope. They are also present in the smear taken from the lymph gland or sputum in case of pneumonic plague.

Treatment

The drug of choice is streptomycin, inj the first dose should be 1 gm intramuscularly, followed by inj 500 mg every six hourly for 24 hours till the temperature is normal. Thereafter, one gm inj should be given daily for about a week. Results are excellent and the disease is curable.

Tetracyclin has proved to be almost as effective as streptomycin. The initial dose should be given intravenously. The adult oral dose of 1 gm six hourly for 48 hours, or longer if needed. After the improvement, the dose maybe reduced to 2 gm daily for about two weeks.

Combination is also used with great advantage and worthwhile to be tried.

Prevention

Anti-rat measures are necessary. Specially in the winter season. The first sign is of rat fall and should be seriously taken.

Plague vaccine is available for mass vaccination which should be immediately given specially in the schools and in the localities where the rats are prevalent.

3. Spirochaeta

Yaws

Yaws is caused by *Treponema pertenue*. It involves skin and bones infection which is transmitted by bodily contact from a patient with infectious yaws through minor abrasions of the skin of the other person. Children are most likely to get infected as

they are often sitting on the laps of their mothers and the lesion is on the skin of the mother. Or when they sleep together closely. It is supposed to be a disease of backward and indigenous people. At the site of infection a proliferative granuloma developes containing numerous treponemata. The primary lesion is followed by eruption on the skin as multiple papillomatous lesions. There is hypertrophic periosteal lesions on many bones. All these lesions of early yaws heal without appreciable scarring or deformity unless there is secondary infection. After variable interval let yaws may develops characterized by destructive lesions like gummata of tertiary syphilis which heals with much scarring and deformity.

The incubation period is 3 to 4 weeks. The primary lesion is usually on the buttocks or legs. The secondary eruption follows after few weeks when the primary lesion is healed. It is usually papillomata found around the mouth. These lesions are highly contagious. (Wet crab yaws) the bones of all the fingers distal to the carpus except terminal phalanges which get rarified. And also the nasal bone gets affected called "goundou." The distorted tibia is called "Sabre tibia."

All the lesions heal very rapidly after administration of penicillin. A clinical condition called latent yaws the symptoms of which may appear after 5 to 10 years and maybe called tertiary yaws. Another clinical variety is late yaws. When there is solitary ulcerative lesion may penetrate deeply in the underlying tissues and may cause gross disfigurement. It resembles the gummatous ulceration of tertiary syphilis.

Late lesions may cause "dry crab yaws" on the palms and soles and subcutaneous nodules may appear around the joints. Yaws does not affect the internal viscera such as cardiovascular or nervous system.

Treatment

The specific treatment is penicillin which is highly effective and very goods results follow the intramuscularly administration of 750 mg of procaine penicillin once a week. Maybe carried out few weeks till there is complete recovery.

Tetracycline 1 to 2 gm daily for five days is as successful as penicillin.

Improved personal hygiene, standard of cleanliness and chemotherapy to the affected patients can help the prevention of this disease**.** The mass campaigns by the WHO in 1950 to 1960 treated over 60 million people and eradicated yaws from many countries.

Relapsing Fever

It is caused by spirochaetes of genus Borrelia, transmitted by lice or soft ticks. This appears in epidemics, particularly in wars, famine when refugees are crowded together and conditions are unfavorable. It can also be accompanied by louse-borne typhus. This is a disease of cold climate. The louse infects only man but is not transmitted from louse to its progeny.

The ticks once infected remain infected throughout life and convey the infection to their offspring. Thus the tick worm relapsing fever is an endemic disease. In the louse borne relapsing fever, the spirochaetes multiply in the blood and cause hepatitis, jaundice, hemorrhages, petechial hemorrhages in the skin, mucous membrane and internal organs. There is fever also. Thrombocytopenia is marked and the liver function is impaired. Urine frequently contains protein and there is sometimes frank hemeturia. Incubation period is 2 to 3 days and onset is always sudden with fever, rapid pulse, headache, body ache, red conjunctivae. There maybe epistaxis and herpes labialis. Often there is an enlargement of spleen and liver. There are non febrile periods in between and therefore, it is called relapsing fever. The spirochaetes are present in the peripheral blood and can be seen under microscope.

Treatment

Procaine penicillin 200 mg IM inj followed by next day 0.5 gm. Tetracycline is the most effective

combination. Tetracycline alone can be continued about ½ gm daily till the disease is cured. Doxycycline 200 mg once by mouth can start the control of the disease. Initially, there is fever with chill and brisk rise of temperature. Sometimes, there is a cough, confusion, distress, delirium and convulsions followed by coma. Cardiac failure may take place. Patient should be strictly on the bed. Careful nursing and management is most necessary. *The patient's clothing should be kept in the antiseptic before washing*.

Rat Bite Fever

It is called Spirillum minus and *Streptobacillus moniliformis* transmitted by rat bite and can also occur in epidemic due to infected milk. Wound usually heals but suddenly may get inflamed, indurated, purplishes and painful after 5 to 21 days. It may ulcerate. The lymphadenopathy leukocytosis, splenomegaly and fever which remains for 2 to 4 days and then becomes normal. Again bouts may continue to recur for weeks and weeks in untreated cases. There is muscular pain, rash over the trunk and extremities. Usually *Streptobacillus* is accompanied. The *sp. minus* can be demonstrated in the exudate from the inflamed bite or lymph node aspirations.

VDRL is false-positive and should not be relied upon for diagnosis.

Treatment

Both infections are readily treatable and cured by penicillin, streptomycin or tetracycline.

4. Viruses

Yellow fever

Yellow fever is a viral disease, viral fever is transmitted to manby the bite of an infected Aedes mosquitoes. Mosquitoes becomes infective after injesting the blood containing virus from forest animals and monkeys and remains infective for its life which maybe as long as 7 months.

Yellow fever is common in Africa and is also found in South America. Monkeys are carriers of the virus. In the endemic area people get subclinical infections and with this acquire immunity and the attack maybe mild.

The main lesion is found in the liver and kidneys where hemorrhage takes places in many organs. Then a severe jaundice appears and therefore it is called yellow fever. The incubation period is of 3 to 6 days. The attack maybe mild, moderate or very severe. The disease starts with highest fever and then there is a frontal headache, backache and pain in the bones. Face is flushed and conjunctive injucted, tongue is coated and edges are red. The patients becomes prostrated, vomits which contain an altered blood. There is epigastric pain, mentally irritability and photophobia, the pulse is very quick, temperature is high and there is a persistent leukopenia. The urine contains proteins, bile salts and bile pigments. The serious patients are very toxic and fatal due to hepatic and renal failure. There are petechiae, hemorrhage in the skin. Patients dies in a few days in serious attacks. If patients survive they develop life long immunity.

Diagnosis

It is done clinically in the endemic area.

Treatment

No specific treatment available. Symptomatic and palliative treatment is to be continued in the hospital.

Prevention

A single dose of 17 D vaccine is adequate to give immunity for about 10 years.

Dengue fever

This dengue arbo virus is transmitted to man by mosquito *Aedes aegypti*. A mosquito gets infected by biting a patients. It is usually found common in the summer season. The incubation period is of 5 to 6 days. The disease varies considerably in clinical

severity. There are marked constitutional symptoms such as severe backache, headache, movements are painful there is photophobia, redness of eyes, lacrimation, nausea and vomiting, anorexia, insomnia and depression. There is a small interval after 24 to 48 hours and again recurrence. Therefore temperature is called "saddleback fever." The pulse rate is slow and the temperature comes down after 7 or 8 days and patients improves. There maybe rashes on the skin. After the temperature is normal, depression and weakness persists for long times. Diagnosis is usually easy by clinical symptoms during epidemics.

Treatment

There is no specific treatment. General and palliative treatment to be carried.

Rabies

Rabies is a very serious viral disease caused by bite of a mad dog or some times even by mad cats. The incubation period depends upon the site of bite and the distance to brain but is usually for 9 days. If the dog bites on the upper arm, face head, the incubation period is minimum. *Once the symptoms appear it is almost invariably fatal. So the treatment has to be given immediately to prevent the appearance of the disease. That is during incubation period only.*

Signs and symptoms

The patients fears water called hydrophobia although he is thirsty he cannot drink water. As soon as he sees the water there are violent contractions of diaphragm and respiratory muscles and thereafter site of even sound of water may precipitate the spasm and attacks. Delusions and hallucinations may develop. Sedatives modify the attack. The signs of encephalitis maybe evident and hyperpyrexia develops and a patient dies within weeks.

Diagnosis

Isolation of virus is possible from the smears or skins, if the immunofluorescent techniques are available. Initially the bite wound should immediately clean with ammonium detergent. Rabies can be prevented if the patient is treated early during the incubation period.

The vaccine use in practice is as follows.

1. Rabipur (Aventis).

One ml liter injects IM 0,3,7,14,30 and 90. This is after the exposure to the infections.

Prophylaxis (3 Dosages)

1 ml liter on each days 0,28,56. Reinforcing vaccination after 1 year between 2 and 5 years.

5. Chlamydia

Lymphogranuloma inguinale (Venereum)

This is a venereal disease. Comes during sexual contacts after an incubation period of 1 to 4 weeks. In the beginning there is primary herpetiform lesions on the genitals which passes to the regional lymph nodes and there it proliferates and multiple small abscesses are formed. Usually in the groin and occasionally in pelvic lymph nodes. The gland is tender and adherent to the underlying tissues. Ultimately the gland bursts and thick fluid gets discharged and there are numerous small sinuses. Healing is very slow associated with marks and scarring. A small disability results. Fistulae are formed between rectum, vagina and urethra. There can be ulcerative proctitis and stricture in the rectum. There maybe fever severe weakness and loss of weight.

Diagnosis

It is done by "Frei" test. The organism can be cultured.

Treatment

1. It may respond well to sulphadimidine about 4 g per day in divided doses for 14 days.
2. Tetracycline 2 g daily for 14 days.

The inguinal nodes require aspiration if necessary never incise. Surgery maybe helpful for treating the complications and fistulae.

Trachoma

Trachoma is called by an agent *Chlamydia* group and it is a communicable disease keratoconjunctivitis, follicles, papillary hyperplasia, pannus and in the later stage cicatrization. Young children are particularly affected. Transmission is usually by contact, fomites or unhygienic surroundings. Vast number of people suffer from trachoma in dry dusty areas of sub-tropics and tropics but it is also present in European countries and Great Britain.

Clinical Features

Onset is usually slow and infection may not be apparent to the patient. Conjunctival irritation, smarting and watering stickiness and blepharospasm maybe noticed. The follicles are seen on the upper tarsal conjunctiva. Soft folicals are present with papillary hyperplasia. Pannus formation starts. In later stages, there is scarring. Trachoma may also cause acute opthalmia neonatorum and secondary bacterial infection may follow.

Treatment

Tetracycline eyedrops or eye ointment are useful. To be used for about six months. Oral sulphonamide in proper doses for three weeks is useful for additional treatment. Deformity and scarring of corneal opacities, ulceration requires surgical treatment by an ophthalmic surgeon after control of the infection.

6. Rickettsiae

Typhus Fever

Rickettsiae are intermediate between virus and bacteria. They maybe natural inhabitants of the cells of the intestinal canal. These are the parasites of vascular endothelium specially of capillaries and small vessels, producing lesions in the skin, central nervous system, heart, lungs, kidneys and may cause thromboses and small hemorrhages.

There are louse-born typhus and flea-borne typhus. The incumbation period is about a week to fortnight. The disease manifests itself by enlargement of the lymph nodes, rashes on the skin like measles. The rash appears in the wrist, forearm, ankles and spreads on the back limbs and chest and lastly on the abdomen. Palms soles and face are also affected. Petechial hemorrhages on the skin of various sizes are seen. Involvement of cardiovascular system and central nervous system in the advanced cases end into fatal result.

Diagnosis

It is mostly clinical Rickettsia can be isolated from the blood. The weil-felix reaction does not help. But the complement fixation test if positive is diagnostic.

Treatment

Antibiotics, tetracyclin in doses of 250 mg four times a day control the disease immediately. In severe cases, dosage maybe doubled. Fever usually settles within 2 to 3 days. The drug treatment should be continued at least for a week. Similarly doxycycline 100 mg dose is quite useful to start with. But to continue the same daily dose for about a week. General treatment and symptomatic treatment is most necessary to control the complications. Lumber puncture maybe needed to relieve the intracranial pressure. *For prevention vaccine is available which is to be given 1 ml subcutaneously with weekly interval. Total three injections*.

Q-Fever

This disease occurs throughout the world. And the causative organism is *Coxiella, Bruneti*. This disease is present in wild animals and also in domestic animals. And can be disseminated by air. Man becomes infected by inhaling or injusting infected dust or food and rarely by bite of tick. The milk or urine of the infected animals can cause infection and the people handling the animals or agriculture workers are prone to get this disease.

Clinical Features

The incubation period is of 1 to 2 weeks. The onset is sudden with fever, sweating, maliac, retro orbital pain and anorexia. The temperature rises up to

103°F-104°F with daily remissions and becomes normal after a week or two. The sputum occasionally is blood stained. There is pain in the chest. Spleen is sometimes palpable. Occasionally there can be a rash. The disease usually resolves in about 10 days and temperature become normal and the recovery is rapid and complete. The complications are hepatitis, encephalitis, myocarditis and persistant endocarditis. But, all these complications are very rare, because response to the treatment is very favorable.

Treatment

Tetracycline 250 mg qds, to be continued for 5 to 7 days in a single dose of doxycycline 100 mg does control the disease in endemic areas.

Prevention

Personal hygiene, rat and flee control, cleaning the under garments of the patients properly. The insect repellent (DMP) dimethylphthalate is useful. Clothing of the patient is to be immersed in disinfectants before sterilization use of socks and shoes before walking over grass lands.

Vaccines are available 1 ml inj sc 6th monthly in endemic areas.

7. Helminthes

Diseases due to Trematodes (Flukes)

a. Schistosomiasis (Bilharziasis).
b. Schistosoma haematobium.
c. Schistosoma mansoni.
d. Schistosoma japanicum.

All these diseases are common in Egypt and more or less endemic. They affect the intestine urinary bladder, lungs, uterus and cause granulomatous swelling and symptoms according to the site including hematuria, hydronephrosis, renal damage, uremia and death.

They yield very well to the nitridazole, stibocaptate, sodium antimonyl tartrate and results are good. Surgery maybe needed for the excision of granulomatous and correction of strictures. If the patient is coming from that part of the world, and having the symptoms one must keep in the back of mind these syndromes. Otherwise it is not found in India.

Paragonimiasis (Lung Fluke)

It is common in Japan, China, where crabs are consumed. It is characterized by pulmonary cysts and also granuloma. The sputum contains the ova which helps for diagnosis. The symptoms are similar to that of tuberculosis of the lung, fever, loss of weight, loss of appetite and expectoration of sputum. The treatment is very effective with antibiotics to counteract the secondary infection and specific drug of bithional given in doses of 50 mg per kg of body weight daily or alternate day. The results are encouraging. Lesions localized may require surgical treatment.

Disease due to Cestodes (Tapeworm)

These are ribbon shaped worm, which exists, in the lumen of human intestine. They go on elongating progressively by adding the segments.
There is a big tapeworm called as *Taenia saginata* and pork tapeworm called *T solium*. The worm maybe several meters long. It has got a head called "Scolax" which is about the size of a pinhead.

Clinical Features

It causes discomfort in the abdomen and thepatient notices segment passed in the stools. In case of *Taenia solium* which liberates larvae from the eggs which penetrate into the intestine mucosa and carry to the many parts of the body and develops cysticerci most commonly located in the skin, subcutaneous tissue and form the cysts and can develop in the brain and cause obscure neurological disorder, personality change and occasionally, internal hydrocephalous and fits.

Treatment

1. Filixmas emulsion is given at 6.00 am on an empty stomach followed by a purg.

2. Mebex 100 mg tablets (Cipla) 200 mg twice daily for three days.
3. Nemozole 400 mg tablets (IPCA) once daily for three days.
4. Niclosan 500 mg tablets (GSK) 2 tablets to be chewed with water followed by brisk purgative after two hours.
5. Zentel 400 mg tab (GSK) or suspension 400 mg. As a single dose followed by brisk purgative after two hours.

Echinococcus Granulosus (Hydatid Disease)

This is the smallest tapeworm of medical importance. The larvae of hydatid cysts usually occur in the sheep and cattle. The dogs eats the cyst and pass the ova in the excreta and contaminates the man which gets access to the bloodstream and develops frequently in the liver but sometimes in the lungs and elsewhere resulting into cysts that goes up in the liver slowly and after some years causes pressure symptom in different organs. It is usually in the right lobe of the liver containing a single cyst. The intradermal Casoni's test support the diagnosis.

Treatment

Surgical removal of the cyst. Cyst in the long bone requires amputation.

Threadworms

It is common throughout the world. It specially affects the children. After ova is swallowed development starts in the small intestine but the adult worm is found in the colon and gravis female lays eggs around the anal orifice and her movement in this region is responsible for intense itching specially at night. The ova is often carried to the mouth by the fingers of the child. So, autoreinfection takes place. Ova can be detected in the stools.

Treatment

Same as given for tapeworm.

Roundworms (Ascariasis)

This is a large pale yellow roundworm of about 20 to 35 cm. No segments. Sexes are separate and the ovum is easily recognized under microscope. Man is infected by injusting-contaminated food containing ova. The larvae escape from the ova in the duodenum and find their way to the lungs where they develop further. After invading the alveoli, they then ascend the bronchi and then are swallowed and thus enter the small intestine where they reach maturity. There maybe urticaria and eosinophillia called "Loffler's syndrome." Patient may get nausea, vomiting and colicky abdominal pain and irregular motions. Sometimes the worm is vomited or they may enter into the paranasal sinuses and cause sinusitis. Other complications such as intestinal obstructions are also seen.

Treatment

Same as given for tapeworm.

Hookworm (Ankylostomiasis)

Caused by a small intestinal worm *Ankylostoma duodenal* or *Nectar americanus*. It's a grayish white nematode about one cm length. The ova are passed in feces. The larvae usually enters through the unbroken wet skin and therefore, the farm workers are easily affected. The clinical features are well marked. Every worm puts his hooks in the intestine and sucks the blood, causing anemia depending upon the worm load. There is a severe iron deficiency anemia and hypoproteinemia may develop. The patient may have puffy face. Edema on the extremities and distended abdomen and sometimes with ascites. Tachycardia and breathlessness and signs of cardiac failure are present. In children, mental and physical development maybe retarded. Untreated cases maybe fatal.

Diagnosis

By examination of the stools, the ova of the hookworm are seen.

Treatment

Same as described in the tapeworm.

Filariasis

Filariasesis is caused by larvae or microfilaria, which are visible under microscope. The mature female is viviparous. *Microfilaria bankrofti* is conveyed to the man by the bite of an infected mosquito. The adult worm is 4 to 10 cm. Lives long in the lymphatic of man. The female produces microfilaria which at night circulate in the peripheral blood due to blocking of lymphatics, the clinical picture of elephantiasis of lower limb, genitalia, scrotum, etc. and also lymphangitis leads to temporary lymphatic obstruction followed by thickening fibrosis. Even the upper limb can be affected. The leg resembles that of an elephant and therefore, it is called elephantiasis. It can affect the vulva or breast also. The blockage of abdominal lymphatic cause chiluria. The duration for development of this stage may take 5 to 10 years.

Diagnosis

Examination of the blood smear at midnight.

Treatment

Diethyl carbamazine rapidly kills the microfilaria and improves the symptoms. 50-100 mg tab 2/3 times are given and continued for about a month. Anti-allergic and other symptomatic treatment does give relief to the patient. The adults worm are killed by injection of suramin usually given intravenously. The initial dose 200 mg given to test the sensitivity. This followed by next day one gm. Dissolving 10 ml of distilled water and injected IV and to be repeated after 3 to 5 days. The total dose is 5 to 10 gm.

8. Diseases due to Fungi

Histoplasmosis (Histoplasma capsulatum)

This parasite goes through a yeast phase, multiplies in the reticuloendothelial cells and produces necrosis in which the parasite maybe found in enormous numbers. From this foci it goes in the blood and cause metastatic lesions in the liver, spleen and the lymph nodes. Pulmonary histoplasmosis simulates pulmonary TB. The infection is due to inhalation of the dust containing spores. The lymph nodes are enlarged areas of calcification which are seen after the cure of the lesions, the skin and mucosa maybe affected occasionally. Liver and spleen may enlarge. Irregular fever, anemia and leucopenia is present. If adrenal is aftected the symptoms of Addison's disease appear. When mucosa of mouth and gastrointestrinal tract becomes infected there is vomiting and diarrohea.There maybe fever of short duration like enfluenza or it maybe a severe and prolonged fever which ultimately proves to be fatal.

Diagnosis

Material from lymph nodes biopsy reveals the fungi. It can also be cultured or by animal inaculation.

Treatment

1. Amphotericin B is indicated 0.5 mg per kg body weight in 500 ml of 5 percent glucose given intravenasly over a period of 6 hours daily till the symptoms are improved and then thrice a week.

9. Arthropods

Scabies

Scabies is due to mite *Acarus scabei*. It is common in the tropics. It causes itching in between the fingers and on buttocks or penis where the mite burrows, later on all over the body.

Scabies is treated by a single application of gamma benzene hexachloride 1 percent on the whole body below the neck and by daily applications for 2 to 3 days.

10. Snakes and Marine Animals

About more than 70 percent snakes are non poisonous and their biting is not fatal what is required

is to reassure the patients and treat symptomatically.

The poisonous snakes are as given below.

1. Cobra, craits and mambas.
2. Sea-snakes.
3. Vipers including Russell viper and Pit viper

The cobras are powerful neurotoxic and also cytolytic. The sea snakes contains myotoxin which causes necrosis of muscle and vipers are cytotoxic and hemolytic causes intravascular hemolysis.

Symptoms depends upon the type of snake bitten. If hemolytic there are multiple of hemorrhages and blood loss and symptom of shock. If neurotoxic is paralysis there is drooping of eyelids, slurring of speech, ophthalmoplegia, extensive paresis leading to respiratory failure, renal failure and death.

Treatment

Apply tornique above the bite. Clean the wound with water and antiseptic and encourage the bleeding. Give antivenom after testing sensitivity. Treat the shock with IV fluid and if respiratory symptoms are there give oxygen. If hemorrhages are severe give blood transfusion and antibiotic for secondary infections and tetanus antitoxin and antigas-gangrene serum maybe advisable.

11. Disorders due to Climate

Heat Exhaustion

Heat exhaustion is caused by physical exertion in the bright sun without not taking enough fluid and salt to balance the loss of sweating. The accompanied symptoms of vomiting and diarrhea may enhance the seriousness.

There is headache, muscular cramps specially in legs and feets, and irritability and lack of attention. Patient is distressed and anxious with pale sweating skin, rapid pulse, low blood pressure and often complaints of cramps. There is dehydration but there is no thirst and consequently considerable degree of water depletion exists.

Treatment

Remove patient to the cool place and replace the fluid and salts by IV drip. The results are excellent if treated early.

Heat Stroke (Heat Hyperpyrexia)

It occurs in those exposed for a considerable period to the unusual high atmospheric temperatures common in unacclimatized people. Patient are more liable to suffer, The disorder is particular as there is no sweating and body temperature may increase up to 42° to 43°C or even higher, unsuitable clothing and poor working conditions predispose the heat hyperpyrexia.

Treatment

The aim of the treatment is to reduce the temperature as quickly as possible and this is done by wrapping the patient in a cool wet sheet or bathing the patient with ice water as the temperature falls, start the glucose saline IV. If patient is unconscious do lumber puncture. Intravenous hydrocortisone maybe life saving. The potassium deficiency should be corrected. And if required blood transfusion maybe given. With proper treatment patient becomes normal.

Prevention

Avoid severe physical exertion in very hot atmosphere.

Adequate fluid such as fruit juices with salts should be taken frequently in hot atmospheres.

Dressing should be suitable to the climate. Do not use warm clothes, and necktie etc.

Keep cross ventilation open and fans on. If there is an arrangement for A/C start it.

Environmental Pollution 30

INTRODUCTION

What is environment?

Environment is restricted to a thin layer, existing for a few kilometers above and below the surface of the planet called "BIOSPHERE." Within this place a series of cycles take place, which are affected by solar energy. These cycles are self-perpetuated and add maintenance to health in suitable conditions to sustain life from time immemorial.

All factors of environmental health are linked together which include flora and fauna to form the biotic environment. Naturally, damage to any one factor affects the other.

Pollution is the change or an addition in the environment, which makes it less favorable or even harmful to any living being. Any substance causing pollution is called "Pollutant." Factors affecting the environmental changes are as follows.

Population explosion

According to 14th census declared on March 2001 Indian population is 1,02,70,15,247, which is tripled since partition of India within half century. Every sixth person in world is Indian. There has been addition since the date 181 million persons. The density per sq. km. 324 and sex ratio 933 female 1,000 men, India ranks second in world population is worth noting.

Industrialization

There is a tremendous industrial growth since freedom as in the list mentioned as below:

Towns and Industries

Town	*State*	*Industries*
Agra	Uttar Pradesh	Stoneware, marble, leather, carpets
Ahmedabad	Gujarat	Cotton Textiles
Aliabet	Gujrat	Oil Well
Alwaye	Kerala	Alluminium, Monazita, Rare Earths Factory
Aligarh	U.P.	Locks
Ambala	Haryana	Scientific Goods
Ambernath	Maharashtra	Machine Tool, Prototype Factory
Amritsar	Punjab	Shawls, acid, carpet, woolen goods, cloth printing, baby food
Ankleshwar	Gujrat	Oil
Avadi	Tamil Nadu	Heavy Vehicles Factory "Vijayanta Tank"
Bangalore	Karnataka	Hindustan Aeronautics Ltd.Indian

Contd...

Contd...

Town	*State*	*Industries*
		Telephone Industries Ltd and Hindustan Machine Tools
Barauni	Bihar	Oil Refinery
Bareily	U.P.	Resin, industries, woodwork
Bhadravati	Karnataka	Alloy Steel
Bhatinda	Punjab	Thermal Plant
Bhilai	Chattisgarh	Steel Plant
Bhopal	Madhya Pradesh	Heavy Electricals
Bailadila	Madhya Pradesh	Iron ore, Mechanised mine
Bokaro	Jharkhand	Steel Plant
Cambay	Gujarat	Petroleum
Chindwara	Madhya Pradesh	Limestone, Coal
Chittaranjan	West Bengal	Locomotives
Dalmia Nagar	Bihar	Cement
Dhariwal	Punjab	Woolen Goods
Digboi	Assam	Petroleum
Dum Dum	West Bengal	Aerodrome
Durgapur	West Bengal	Steel Plant, Dry Ice
Kunore	Tamil Nadu	Thermal Power
Ernakulum	Kerala	Cables
Nagpur	Maharashtra	Cotton Mills, Oranges
Nepanagar	M.P.	Newsprint
Neyveli	Tamil Nadu	Lignite
Ogalewadi	Maharashtra	Hurricane Laterns, stoves
Otacamund	Tamil Nadu	Photo Films
Pilani	Rajasthan	Thermal Power
Pattabhiram	Tamil Nadu	Micro Tools
Perambur	Tamil Nadu	Integral Coach Factory
Pimpri	U.P.	Power Generation
Pinijore	Haryana	Machine Tools
Rana Pratap Sagar	Rajasthan	Atomic Power Plant
Ranchi	Jharkhand	Heavy Machine-buildings, Foundry Forge
Ranigunj	Bihar	Coal Mining
Ranipur	Uttaranchal	Heavy Electricals
Renukoot	U.P.	Aluminium
Rourkela	Orissa	Steel Plant
Rupanagar	West Bengal	Telephone Cables
	Bihar	Fertilizer
Shriharikota	Andhra Pradesh	Coal
Singhbhum	Jharkhand	Copper
Surat	Gujrat	Textiles
Tarapur	Maharashtra	Nuclear power
Tiruverumbur	Tamil Nadu	Pressure Boiler
Trombay	Maharashtra	Atomic Reactors, Plutonium, Fertilizer, Thorium Plant
Thiruvanan-thapuram	Kerala	Wood Carving, coir mating
Tuticorin	Tamil Nadu	Fertilizer, Thermal Power, Copper smelter plant
Uadipur	Rajasthan	Zinc Projects
Varanasi	Uttar Pradesh	Silk and brocade, brassware, lac bangles, diesel locomotives
Visakha-patnam	Andhra Pradesh	Ship Building
Zaina Kot	Jammu and Kashmir	HMT Watch Factory
	Bihar	Uranium Ore Mill
	Maharashtra	Hydro-electric
	M.P.	Vehicles
	Rajasthan	Embroidery
	Karnataka	Machine Tool Factory and Electronics
	Jharkhand	Iron and Steel Goods
	Bihar	Coal
	Rajasthan	Mechanised Farm (India's Second)
	H.P.	Petroleum
	Gujarat	Atomic Power Plant
	Gujarat	Fertiliser
	Tamil Nadu	Atomic Power Plant
	U.P.	Leather Shoes
	Rajasthan	Copper
	Maharashtra	Agricultural Implements
	Kerala	Ship building
	Karnataka	Gold Mine
	West Bengal	Jute manufacture, Electric bulb and lamps
	M.P.	Coal mine, Aluminium
	Maharashtra	Power Generation
	Maharashtra	Aluminium
	Kerala	Calico, Rubber coir
	Karnataka	Cement Plant
	Punjab	Hosiery
	Uttar Pradesh	Gold, Silver, Lac and Embroidery work
	Tamil Nadu	Fertiliser/oil Refinery
	Tamil Nadu	Cotton and Silk Wearing
	Tamil Nadu	Aluminium
	U.P.	Mechanised Farming
	Punjab	Colour picture tube, LCVs, Tractors, Micro-chips
	U.P.	Utensils
	Maharashtra	Cotton Textile and other industries
	Karnataka	Silk
	Punjab	Fertilizer, Heavy Water Plant
	U.P.	Atomic Power Plant

The growth of industries has caused:

1. Chemical waste causing soil pollution.
2. Water waste causing water pollution of rivers and other water sources.
3. Smoke causing air pollution in furnaces, foundries.
4. Overcrowding of employees causing unhygienic hutment zones.
5. Increased transport exhaust smoke.
6. Invading the agricultural land and reducing food production.
7. Reducing the forest and affecting the natural balance.
8. Sound pollution due to loudspeakers, radio, T.V. Tape recorders, bands, horns, aircrafts, cars, buses, transports, sea wave dashing, slogans, music with loudspeaker, Mechanical repairs, bore wells road working for repairs causing loss of hearing, loss of peace, disturbances, loss of sleep, irritability.
9. Apart from these factors, the internal geological changes in the planet may appear as volcano, lava, earthquakes and seaquakes affect substantially the environmental damages.

And thus promote pollution substantially.

The result of pollution

1. Global warming if the preparation of carbon dioxide is greatly increased, the excessive CO_2 accumulates near the earth surface and traps inlarge amount of heat. Since, the heat cannot inscape, the temperature of the earth increases gradually, which also causes the melting of the ice at the north and south poles. This may increase the level of the seas' water all over the world and many coastal lands may get flooded and low land towns and cities may get drowned.
2. Effect of poisonous gases in the atmosphere can cause acid rain. Rainwater gets dissolved in oxides of sulphur and nitrogen and forms sulphuric acid and nitric acid. As it falls to the ground; it is called "Acid Rain" which falls on the soil and water. It damages plants, normal life, monuments and buildings.

   Effects of the cutting of trees and forests. It damages the oxygen and carbon dioxide balance. Water balance is also upset. The soil become infertile and reduces the production of the food grain, soil particles together get spoiled. It becomes infertile and rain-washes out nutrition. It makes the soil unfit for cultivation of crops.

Nutritional Status

Normally healthy individual requires about 31 essential nutrients to maintain the normal physiological foundation. The growing global population has reached 4,000,000,000 by 1976 and has added all so far a threat to mankind. It may not only be due to increased fertility but is also due to remarkable reduction of death in recent years due to prevention of infectious decreases and due to treatment by geriatric care and improved gridiron net result is:

a. Shortage of food.
b. Increasing the cost of food and increasing unemployment.
c. Famines and hampered agricultural production and products dependent only on rains.
d. Natural calamities such as floods, earthquake, storm.
e. Wars and conflicts and lack of transport facilities.

   About 400 million people are undernourished in the world and many of them are pregnant mothers and children. *The details are not appropriate to a clinical primer of this book*. It is well discussed under the chapter of nutrition but there is obvious sub-nutrition, malnutrition and starvation causing the damaging to the health of the people increasing to the alarming situation.

Nutritions problem affecting the inhabitants of the planet

The Effect on Climate

Our relation in solar system principally dominates our climate with solar system centered around the sun. There are nine planets in the system they are:

1. Mercury
2. Venus
3. Earth
4. Mars
5. Jupiter
6. Saturn
7. Uranus
8. Neptune
9. Pluto

The sun, which is one of the stars, is composed mainly of hydrogen. It is 14 million km. long in diameter and 150 million km away from earth. Earth is the third nearest planet from the sun and revolves around the sun in 365 days. The earth revolves around itself from west to east once in 24 hours. The age of earth is 4.6 million years. The total area being 315,12,000 sq km, three fourth covered by water.

The climate is governed by our planetary position and proximity to sun a fact to be realized while considering the effect of climate on human life over the planet.

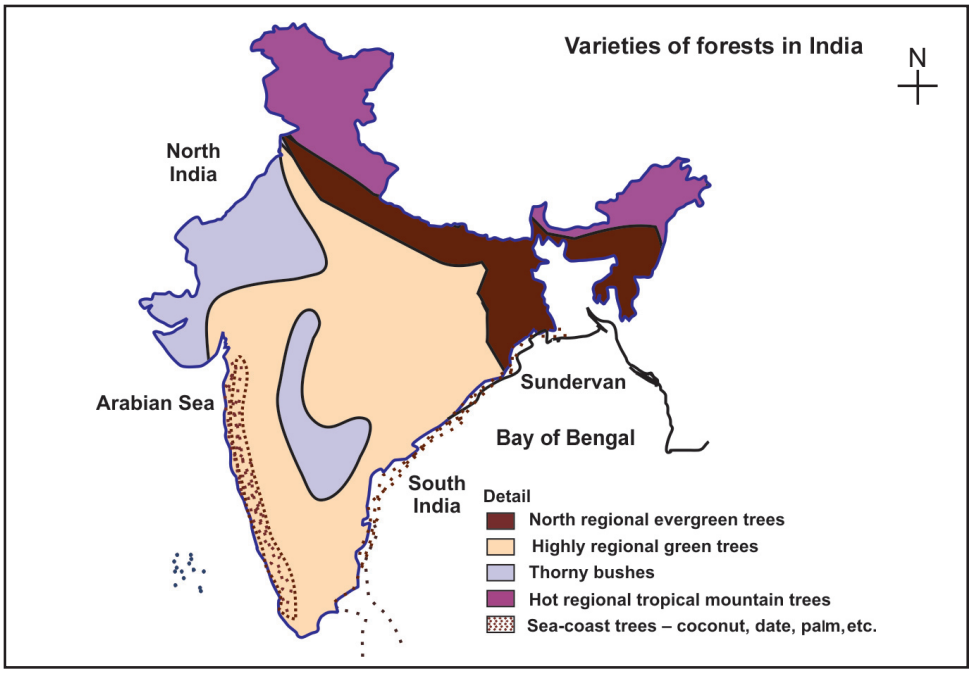
The following are the guidelines for the control of pollution.

1. *Air Pollution:*
   a. Grow more trees.
   b. Use smokeless fuel.
   c. Tall chimneys with filters for factories.

2. *Water Pollution:*
   a. Chemical waste should be prevented to pollute river, ponds and lakes.
   b. Sewage treatment should be scientifically done full advantage of manure and recycle to be taken by purifying water which may be reused for consumption.

3. *Soil Pollution:*
   Control the artificial fertilizers. Care should be takes in using chemicals and fertilizers in excess.
   Natural fertilizers should be preferred than the chemical fertilizers.

4. Avoid dumping of the plastic metallic dust in soil. Plastics and metallic things are not easily broken down by the soil bacteria thus texture of the soil gets spoiled and less productive.



DEVELOPMENT OF ENVIRONMENTAL MEDICINE

As a result of advancement of modern civilization, new but very important problems come up to be faced by the clinicians.

Caption of this book limits a detailed approach but a glimpse will keep the reader informed about the problems and they are as under.

The world has become smaller due to a rapid growth of communication facilities, air, road, sea and freely exporting the diseases to non-endemic area where the population is non-immune and vice versa.

The tourism commerce and educational travel is going on with non-stop speed, which is encouraged by all countries internationally.

The international preventive measures are almost inadequate to stop the exo-dust of viral infections such as HIV and others and completely ineffective towards the environmental hazards of heat, humidity, radiation and pollution including noise pollution and altered food availability in different regions of the world.

Acclimatization is a little lengthy process and is hindered by rapid change of locations by the tourists.

Problems of high attitudes cannot be underestimated incases of hikes and mountaineers developing mountain sickness requiring prompt lifesaving treatment.

Aerospace medicine requires to treat hypoxia, decompression sickness, barotraumas and also the problems of reentry in landing all of which require scientific care by the experts.

Radiation in the environment due to nuclear test has become hazardous and disturbs the normal health of the population.

Under water problems in submarines increases the barometric pressure causing serious consequences and if not promptly treated can be a fatal too. This is not only limited to the navy but also to all those who undertake underwater adventures and jobs like the search of mineral and oil exploration and capture of sea wealth.

Heat exhaustion, heatstroke and sunstroke are already discussed in the early chapter of this book but hypothermia and frostbite do required mention and warning not to underestimate the serious consequences if not prevented and treated effectively in early stages.

Thus the scope of environmental medicine is expanding day-by-day and assuming specialties, training, teaching and being expert in specialized services.

Sandy region with dry hot climate occupies about 20 percent of land in various countries.

Rainfall is negligible, uncertain, unreliable and occasionally even without rainfall.

At midday sun's heat is very high and occasionally unbearable, while at night the climate is very cool.

These regions are always full of life and trees. (Flora and Fauna) which are suitable to these conditions. Trees such as cactus, coconut, dets, etc. are found. And life accustomed to sand live in deep holes and can hibernate off-season and come in life when rainfalls.

The ponds and small lakes are surrounded by greenery and reptiles survive and flourish during the rains when the picture becomes lively.

Conclusion

It is needless to say that we are surviving because of environmental health and the subject must be made compulsory in education, publicity and regulations so that voluntary public cooperation comes forward enthusiastically and the goal of health for all can be achieved. An ideal of zero population rate which mean the number of births to be less than number of deaths is a worthwhile globally accestable policy; in which resources are more than its utilizers.

Future of Dentistry 31

As mentioned in the foreword, the dimensions of dentistry are rapidly increasing and expanding globally. The exchange of knowledge from Research Institutions, Specialized hospitals and intercommunicated investigation facilities, developments have given a new outlook to the future of dentistry.

As clairvoyant one can see the future practicing dentist well equipped with all necessary equipments at his clinic and also specialized advanced investigation facilities with Institutional communications well prepared for emergency with educationally well trained staff and best assistance from the Dental Lab will be more organized with the help of computer for record keeping and will learn out of his own experience as well as from Dental magazines, books, lectures, conferences, etc.

Surgery will be revolutionized soon and instead of a knife use of laser beam in dentistry will be more common than today, causing painless operations, with quick results and no complications of bleeding and hemorrhages. It is needless to say that dental specialists at present maybe one, but it maybe sub-divided into Dental physician and Dental surgeon, separately. But this possibility may not come in reality at all.

The dental education is expanding day-by-day and dental colleges in India are about 100. And everywhere, dental colleges are coming up like mushrooms, increasing the number of dental students and there will be increased number of dental Practioners. So that they can cover the whole population satisfactorily.

As seen in practice, a person has to be the dental patient from infancy to the death anytime and therefore, the need of dental assistance from tooth extraction, cavity, root canal, crowns, bridges and dentures as well as tooth implantation. The work of every type is increasing as well as advancing. Dental material is day-by-day improving in quality, cost and durability, which are good signs altogether.

The public at large is becoming more and more dental conscious. Specially the cosmetic dentistry as well as prone to the dental implantation as a permanent resort instead of replacement of the teeth that increases the avenue and quality of practice.

Now, the public has become more orientated with the sub-specialties and are voluntarily approaching the sub-specialties directly. Their expectations have also increased at one hand with quick 100 percent satisfactory results at an affordable cost on the other hand

which may or may not be possible, the standard of living is going up and the cost of living has also gone up simultaneously rapidly with advanced dental instruments etc. becoming very costly as a consequence affecting affordability adversely.

The communication system is so much improved that everybody has got mobile phone in their pockets and the contacts have become very easy, direct and useful. The drawbacks of the past are being washed out because of gronting quick communication facilities.

On the whole, the outlook is optimistic and dentistry is going to expand and become more equipped than before and will continue with the same because of contributing experiences among themselves through the various magazines, articles, books and conferences.

Dental students require being more alert, more knowledgeable and ambitious to meet the need of the day. Ignorance cannot be an argument and references required to be made with the other specialties. Reference books must be at hand for reference in order to give the best services to the patient in general, which is the need of the day.

All dental practitioners should attand the periodic refreshing and recession classes in India or also in other advanced countries to keep them self up date.

Every dental practitioner should actively take part in the preventive dentistry programs in schools, colleges, factories and also become expect in floride implementation techniques which will help the nation and also make them popular in the incomming population to keep up the practice.

Pediatric Procedures 32

MILESTONES

Newborns travel from birth to adolescence the following milestones are accepted for convenience.

1. Newborn.
2. Early infancy — birth to 6 months
3. Late infancy — 6 months to 18 months
4. Early childhood — 18 months to 5 years.
5. Late childhood — 5 years to 12 years
6. Adolescence — 12 years to 18 years.

HOW PEDIATRIC PROCEDURES DIFFERS FROM OTHERS

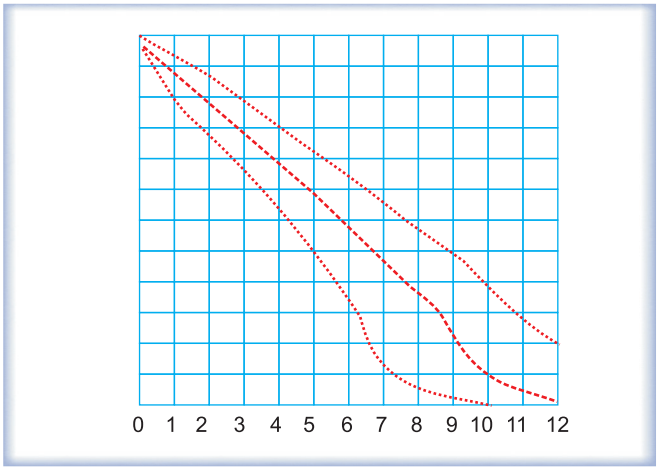
1. Congenital anomalies are detected.
2. Very rapid speed of growth,
3. Anatomical and physiological immaturity.
4. Highest risk of mortality/morbidity/and infections.
5. Immunity problems/artificial immunization.
6. Marked difficulties in history taking/examination/investigations/and treatment.
7. Maximum emotional involvment of child of parents and relations.
8. Marked sensitivity for environmental variations.
9. Different criteria of assessment, doses, and methods of treatment/investigations.
10. Variations in the treatment of emergencies.
11. Difficulties of collection of speciman for investigations.

ESSENTIAL INFORMATION OF FACTS FROM BIRTH TO ADOLESCENCE

Examination of fetus after birth It is unusual for dentist to get a chance, if he gets an opportunity he should not hesitate and go ahead with asking the family-history of congenital anomalies and see face, neck clavicles, eyes, buckle cavity, throat and record your findings. If abnormal follow-up in future check for umbilical Hernio and imperforated anus and presence of Jaundice.

GROWTH

Highest in the first year. The birth weight doubles at 4-5th month and triples at the end of one year, there are six fontanels, the ant. one closes at 10 to 14 months and after 2 months the posterier. Graph 23.1: are self explanatory.



Graph 32.1: Growth chart

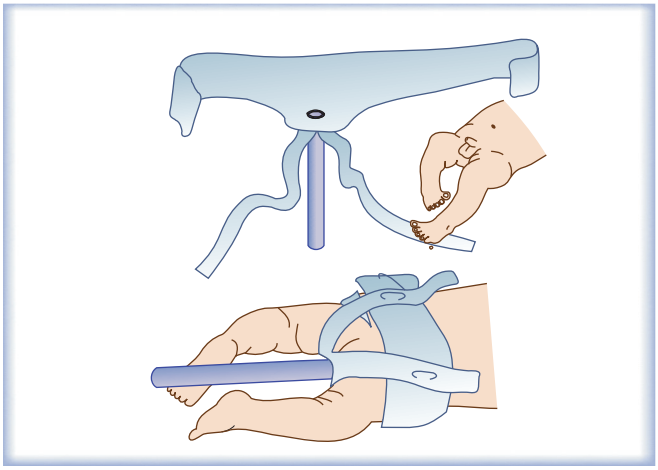


Fig. 32.1: Urine collection in male infant (Step I)

Smile: In response to an adult or to his voice ....
Vocalize: Utters sounds spontaneously or on stimulation.....
Head control: No head lag when pulled to sitting position from supine.....
Hand control: Grasps toes with one or both hands when tue is dangled in midline above his chest.....
Roll over: From back to abdomen.....
Sit alone: For several moments.....
Crawl: By rolling over and over, pushing along on stomach or back, or any other means.....
Prehension: Brings together thumb and forefinger to pick up small objects.....
Pull up: To standing position.....
Walk with support: By holding to p. laypen, furniture or stand alone without any support, for several moments.....
an adult.....
Walk alone: Several steps.....

DEVELOPMENT

Nutrition, breastfeeding, weaning, artificial feeding,and watching all round physical and mental development is outside the scope of this book. Pediatric procedures for investigations IV and lumber puncture technique and urine Collection, (special technique, see Figures 32.1 to 32.14)

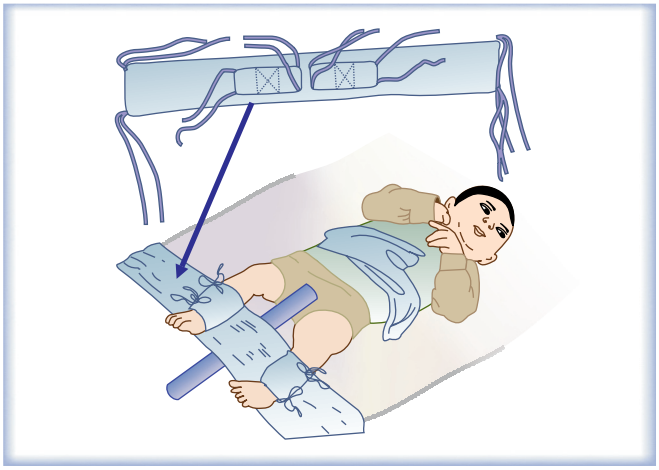


Fig. 32.2: Urine collection

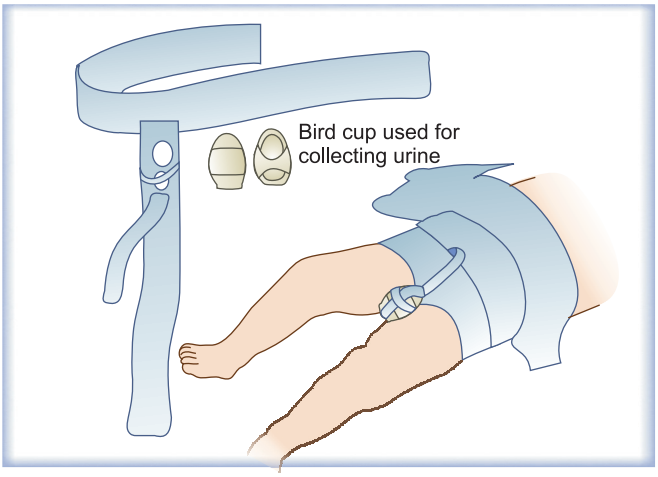


Fig. 32.3: Bird cup used for collection of urine

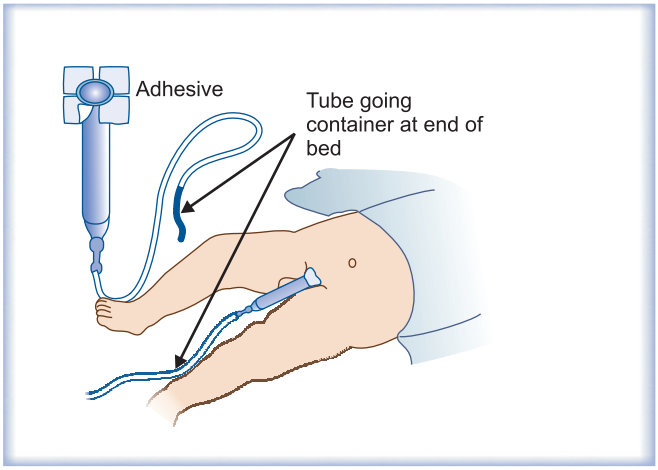


Fig. 32.4: Urine collection (24 hours) in male child using IV

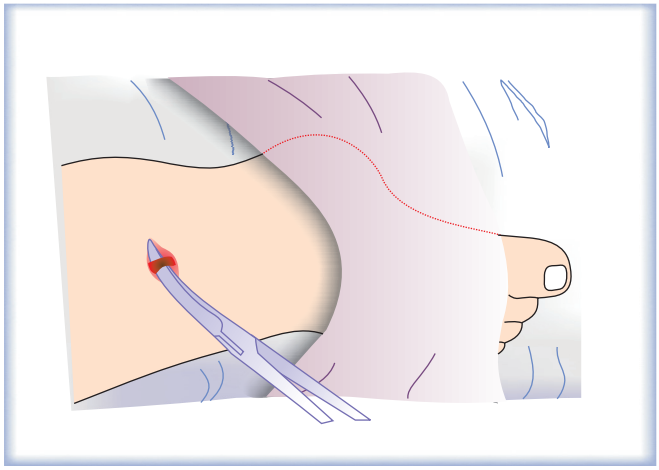


Fig. 32.7: Obtaining spinal fluid

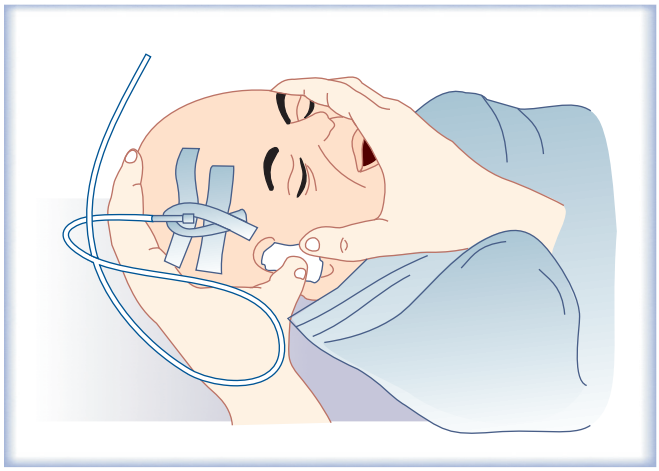


Fig. 32.5: IV Fluids drip into scalp vein

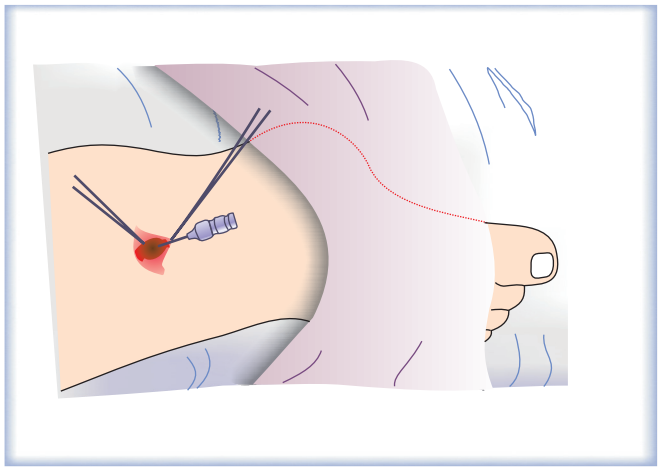


Fig. 32.8: Cut-down intravenous with ligatures tied hypodermoclysis

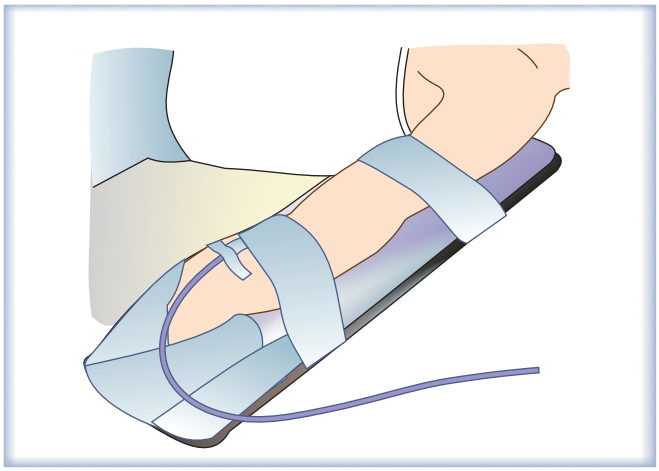


Fig. 32.6: Lumbar cisternal puncture

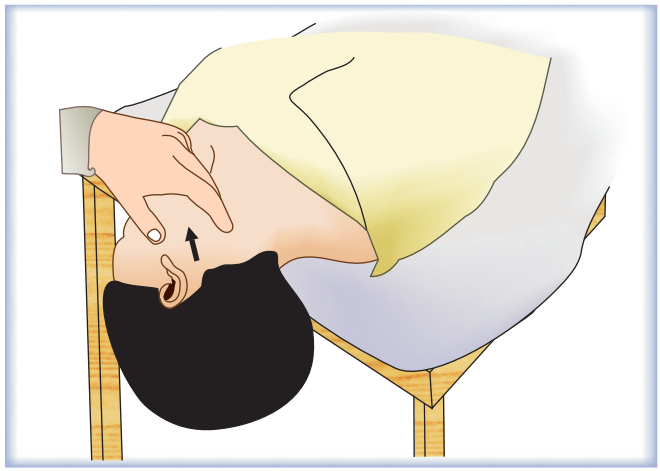


Fig. 32.9: Direction of needle for internal jugular puncture

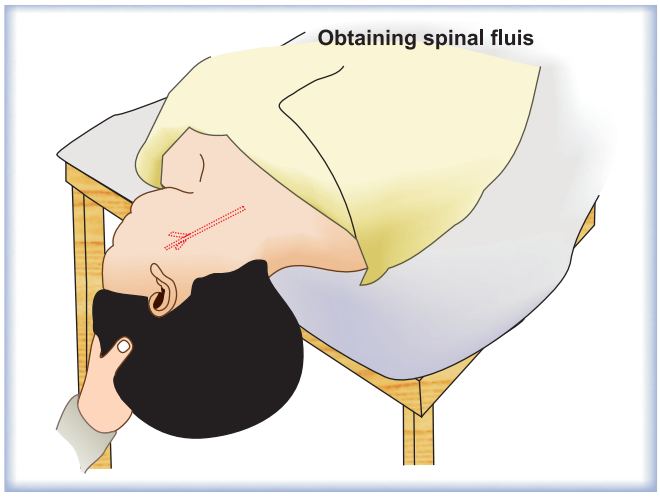


Fig. 32.10: External jugular puncture

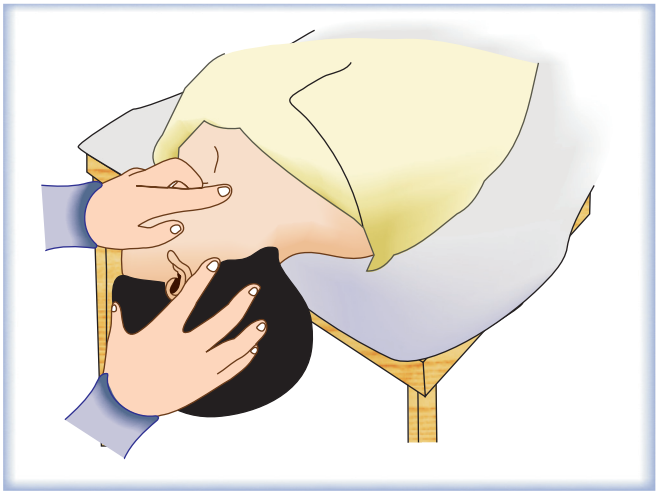


Fig. 32.11: Landmarks for internal jugular puncture

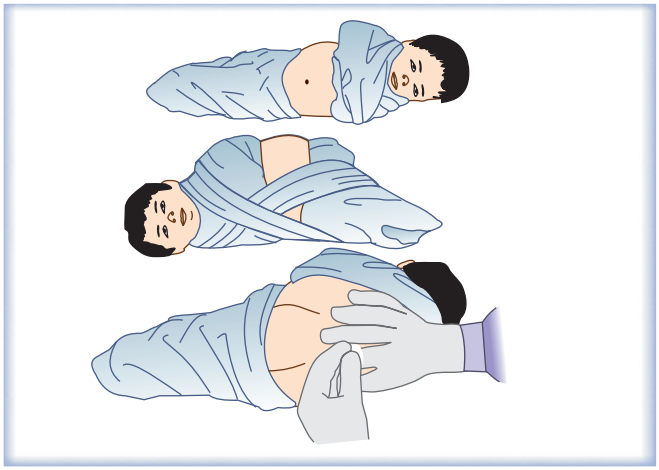


Fig. 32.12: Restraining infant for lumber puncture

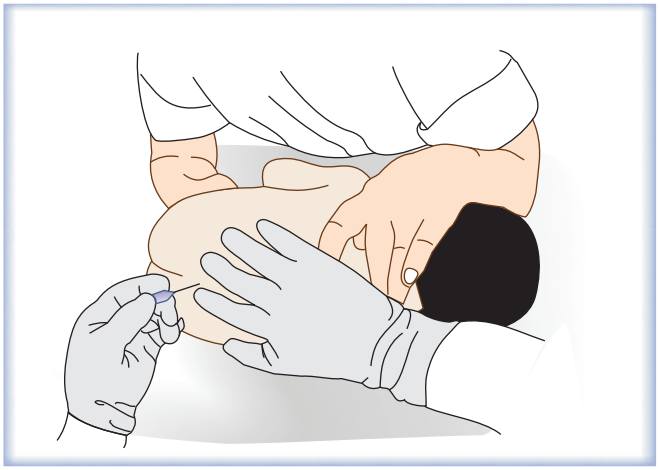


Fig. 32.13: Lumber puncture with assistance of nurse

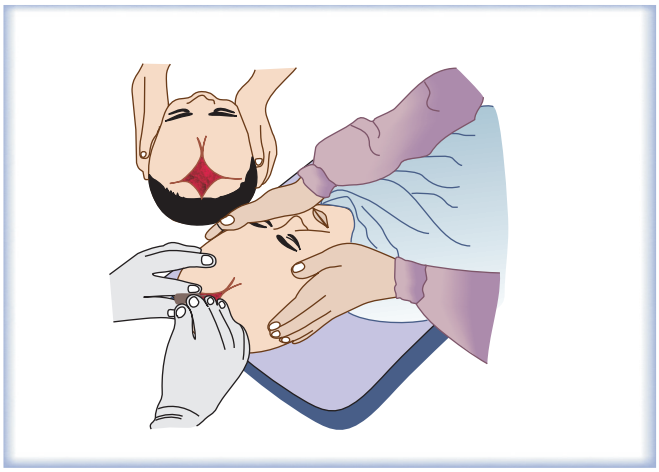


Fig. 32.14: Subdural puncture

SCENARIO OF PEDIATRIC DENTAL PROBLEMS

Dental Anomalies

a. Hypoplastic.
b. Hypomaturation.
c. Hypocalcified.
d. Tourodontism.
e. Fusion.
f. Germination.
g. Concrescence.
h. Dens invaginatus.
i. Dens evaginatus.

Infections: Caries, periodontal-sepsis, TB syphilis, HIV fungal, virus.

Restorative Dentistry: Complete range.

Dental Traumatology: Includes sports dentistry drowning, accidents, etc.

Injury due to chemicals as fluorosis, drugs as tetracycline, burns, etc.

Toxins, poisons, insect bite, scorpion bite, snake bite, spider bite, etc.

Preventive Dentistry: Fluoride therapy, dietary management, home care. Assessment of high and low risk children and plan preventive strategy.

Every section mentioned above is well taught in dental curriculum. Plenty of referral literature is available and this is outside the scope of this book. We therefore advise the readers to be physically prepared to locate the relevant identified information at hand when needed otherwise the delay may prove dangerous.

SYSTEMIC DISEASES AND ORAL MANIFESTATIONS

Cardiovascular system

The dentist may not be adequately trained for detailed CVS exam but good enough to comply with routine and therefore the following important hints.

Exam trolly: Weighing machine for infants is different and must be there tape for measuring the height, torch, tongue depressor, auroscope, nasal speculum, thermometer, special BP apparatus, glowes, mask.

Routine exam: Inspection, palpation, percussion and auscultation

In infants apex beat is in third or fourth left inter costal space just outside the nipple line (on right side in case of dextrocardia).

In early childhood (age 2 to 5) the apex beat is in left 4th fourth inter costalspace at nipple line. At the age of 5 years the apex beat is in left 5th intercostals space at or within nipple line.

Auscultation (heart sounds): During infancy the 1st and 2nd heart sounds are of equal intensity, 2nd HS is often is split and best heard at the base. Feel femoral pulse also.

Murmurs: Functional murmurs are heard those may persists for years in about 50 percent. They are variable on change of posture/and exertion.

GUIDELINES FOR DRUG THERAPY IN CHILDREN

While administering drugs to children, particularly neonates (first 30 days of life), special care is always needed because they differ from adults in their response to drugs. Doses should invariably be calculated on the basis of weight till 50 kg or puberty is reached. In the neonatal period, the risk of toxicity is higher due to inefficient renal clearance, relative deficiencies of various enzymes heightened sensitivity and inadequated tetoxifying mechanism.

If possible, painful intramuscular injections should be avoided. It is always a good practice to state the age of child patient while writing prescriptions. Even though liquid preparations are more easily accepted by children, may contain sucrose which can lead to dental decay.

Dosage

Children doses are stated in many monographs in MIMS. The following age ranges are mentioned: Neonate (first month), infant (up to 1 year), 1 to 5 years and 6 to 12 years. Where a single dose is given, it applies to the middle of the age range. Hence adjustment would be needed to be made for lower and upper limits of the stated range.

Dose Calculation

The dosage for children can be calculated from adult doses by using either age, or body-weight or body surface area or by a combination of these factors. Even though body-surface area provides the most reliable method of determining dosage, in practice it is exceedingly difficult.

Body-weight can be easily used to calculate doses and are generally expressed in mg/kg. Because of their higher metabolic rate, children generally require higher dose per kilogram than adults. This method can pose problems while calculating dose for obese children since they are liable to be given higher than required dose. Under such circumstances, it is better to calculate dose based on ideal body weight of the child in that particular age.

Body Surface Area (BSA)

It is technically a better and more accurate method since many physical phenomenan are more closely related to body surface area. The average body surface area of a 70 kg adult is about 1.7-1.8 square meter. Thus to calculate the dose for a child the following formula is used:

Approximate dose for child =

$$\frac{\text{Surface area of child } \ m^2}{1.8} \times \text{dose}$$

Range for Normal Blood Pressure at Different Ages

Age (years)	*Systolic (mm Hg)*		*Diastolic (mm Hg)*	
	Range	Average	Range	Average
4	08 to 92	80	40 to 68	55
5	68 to 101	89	42 to 74	59
6	41 to 108	90	42 to 98	69
7	80 to 108	93	42 to 74	69
8	90 to 110	89	42 to 74	58
9	90 to 114	61	30 to 72	59
10	72 to 120	94	48 to 72	59
11	04 to 110	96	44 to 74	60
12	84 to 120	100	48 to 82	61
13	82 to 118	100	52 to 78	62
14	86 to 174	100	40 to 80	63

Cardiac Rate and Pulse

The pulse rate during infancy vary from 70 to 150, over 150/min BP below from age: See Chart 4 to 14 years.

Availability of Dental Equipment 33

Dental equipments can be procured from the following lists of companies:

1. The Marketing Manager
   Novo Dental Products Pvt. Ltd.
   428, Laxmi Plaza,New SAB TV,
   off New Link Road, Andheri (W),
   MUMBAI- 400 053
   E-mail: info@novodental.co.in
   Tel. No.022 2630 5755 / 5692 6283/84
   Fax No.022 5697 6191
   E-mail: info@novodental.co.in

2. Mr. Vinod Bhaval (Proprietor)
   MEDENSCO
   Terminus View, 2nd Floor
   167,D.N. Road, Fort,
   MUMBAI - 400 001
   Tel.: 022 2262 5460/ 2267 0185
   Fax: 022 2569 0803
   E-mail: medensco@vsnl.com

3. Mr. S.N. More
   Everything Dental
   H-3/23, Jal Padma Co-Op. Hsg. Soc. Ltd.,
   Bangur Nagar, Goregaon (W),
   MUMBAI - 400 090
   Tel.: 02 3203 7749
   E-mail: amtcorp@sify.com

4. The Executive Officer
   Fourrts (India)Laboratories Pvt. Ltd.
   Plot No.1, Fourrts Avenue,
   Annai Indira Nagar,
   Okkiyam Thorapakkam,
   CHENNAI - 600 096
   E-mail: fourrts@vsnl.com
   Tel.: 044 2496 49 39 (10 lines)
   Fax: 91 - 44 2496 4799
   E-mail: fourrts@vsnl.com

5. The Marketing Executive
   M-Tech Innovations Ltd.
   Mahavir Chambers
   12, Premanad Society, Balaji Nagar,
   PUNE - 411 043
   Web: www.m.techindia.com
   Tel.: 020 2437 6223 / 2437 3323
   FAX: 020 2437 2849
   Web: www.m.techindia.com

6. The Executive Officer
   Adonis Medical Equipments Pvt. Ltd.
   51/4, Shiv Srushti
   Rangnekar Society
   Kurla (East) MUMBAI - 400 024
   Tel.: 022 2527 3048/ 3094 7945
   E-mail: info@adonismedical.com

7. Mr. Naishad Kotak
Kosuva Dental and Orthopaedic Manufacturers
36, Kotak Kunj
Bhavan's College Lane, Chowpatty
MUMBAI - 400 007
Tel.: 022 2369 2483/ 2361 9004
E-mail: kosuva@bom3vsnl.net.in

8. Mr. Anand L. Bedre
Gayathri Technologies
8, Bimla Bhavan
New Nagardas Cross Road
Andheri (E), MUMBAI - 400 069
Telefax: 022 832 5692
E-mail: gayatech@vsnl.com

9. The Sales Executive
Telepost India Pvt. Ltd.
Block # 5A, 1st Floor
Prabhadevi Indl. Estate,
408, V. Savarkar Marg
MUMBAI - 400 025
Tel.: 022 422 1834
Telefax: 022 422 2014

10. Mr. R.S. Krishnan (CEO and Director)
Bennet Drugs and Pharmaceuticals Pvt. Ltd.
114, Shrikant Chember
V.N. Purav Marg Chembur
MUMBAI - 400 071
Tel.: 022 557 9574
Telefax: 022 557 5485

11. Amit Manjrekar (Hospital Executive)
Elan Pharma (India) Pvt. Ltd.
501, Raikar Chambers
Govandi, Deonar
MUMBAI - 400 088
Tel.: 022 557 9494
Fax: 022 551 6775
E-mail: elanind@bom7.vsnl.net.in

12. Mr. Dyanesh Tandel (Technical Officer)
RP Photographics,
111, Balaji Arcade
SV Road, Kalbadevi (West),
MUMBAI - 400 067
Tel.: 022 806 3503,
Fax: 022 863 8979
E-mail: rpphoto@bom5.vsnl.net.in

13. Mr. Dilip Shah (Chief Executive)
D. Shah and Co.
24-Sardar Griha,
198, L.T. Marg
MUMBAI - 400 002
Tel.: 022 208 1054/ 237 9297
Fax: 022 206 6464

14. Mr. M. Bhaskaran (Sales Representative)
Confident Dental Equipments Ltd.
No.1, Yamuna Bhavan
Ahimsa Marg (14th "A" Road), Khar West,
MUMBAI - 400 052
Tel: 022 649 8929/ 605 6073
Fax: 022 604 9214
E-mail: confident@bom3.vsnl.net.in

15. Mr. B.A. Shetty/Kailesh
Maya Brothers
B-3/401, Sector 9
Shanti Nagar, Mira Road (East)
MUMBAI - 401 107
Tel.: 022 811 1605
Fax: 022 810 79 03

16. Mr. Vinayak M. Badgujar (Sr. Sales Executive)
Span Diagnostics Ltd.
173-B-New Industrial Estate
Udhna- 394 210 (Surat)
Tel.: 0261 867 7143/867 7211/867 9583
Fax: 0261 366 5757/867 9319
E-Mail: spand@bom3.vsnl.net.in

APPENDICES

Appendix 1: BDS Examination Papers and Sample Syllabus

III BDS EXAMINATION, OCTOBER 2003
GENERAL MEDICINE

Total Duration: Section A + B + C = 3 Hours
Section B and C Marks: 40

Section – B and Section – C

Instructions: 1. *All questions are compulsory.*
2. *The number to the right indicate full marks.*
3. *Draw diagrams wherever necessary.*
4. *Answer each Section in respective answer sheet only.*
5. *Answers written in the inappropriate sectional answer books will not be assessed in any case.*

Section – B

2. Write short answers of the following. *Each* question carries *two* marks. 20

a. Importance of X-ray chest in cardiac diseases.
b. Treatment of anaphylactic shock
c. Ciprofloxacin.
d. Jone's criteria.
e. Complications of typhoid fever.
f. Treatment of status epilepticus.
g. Investigations for iron deficiency anemia.
h. Adverse effect of long-term steroid therapy.
i. Prophylaxis for infective endocarditis.
j. Investigation of bleeding disorders.

Section – C

3. Write *long* answers to *each* of the following: 20
   a. Describe clinical features, investigations and treatment of pneumococcal pneumonia.
   b. Describe clinical features, investigations and treatment of pyogenic meningitis.

III BDS EXAMINATION, MAY 2003
GENERAL MEDICINE

Duration: 3 Hours
Total Marks: 60

Section – B and Section – C

Instructions: 1. *All questions are compulsory.*
2. *The number to the right indicate full marks.*
3. *Draw diagrams wherever necessary.*
4. *Answer each section in the respective answer sheet only.*
5. *Answers written in the inappropriate sectional answer books will not be assessed in any case.*

Section – B

2. Write short answers of the following. *Each* question carries *two* marks. 20

a. Clinical features of tetanus.
b. Drug treatment of falciparum malaria.
c. Treatment of gastric ulcer.
d. Four differential clinical features of bronchial and cardiac asthama.
e. Treatment of thyrotoxicosis.
f. Clinical importance of urine examination.
g. Scurvy.
h. Treatment of neurosyphilis.
i. Eosinophilia.
j. Nifedipine.

Section – C

3. Write *long* answers to *each* of the following:
   a. Give six common causes of Ascites. Enumerate clinical signs of portal hypertension. Describe treatment of hepatic coma.
   b. Enumerate causes of epilepsy. Describe clinical features, important investigations and treatment of grand mal epilepsy.

III BDS EXAMINATION, OCTOBER 2002
GENERAL MEDICINE

Date: 16-10-2002 Total Marks: 60
Time: 2.30 pm to 5.30 pm

Section – B

II. Write short answers of the following. *Each* questions carries *two* marks.
   a. Investigations in a case of chronic diarrhea.
   b. Peripheral smear.
   c. Amoebic liver abscess.
   d. Chancroid.
   e. Treatment of hematemesis.
   f. Causes of patch on the palate.
   g. Investigations in a case of koilonychia.
   h. Causes of Haemoptysis at the age of 60 year.
   i. Diagnostic importance of ECG.
   j. Differentiating points between exudate and trasudate.

Section – C

I. Write *long* answers to *each* of the following:
   a. Enumerate hazards of smoking and suggest preventive measures.
   b. Enumerate causes, classification and management of ischaemic cardiomyopathy.

THIRD BDS EXAMINATION, 2001
GENERAL MEDICINE
FACULTY OF DENTISTRY

Date: 6-6-2001 Marks: 40
Time: 2 Hours 40 Minutes

Instructions: 1. *All questions are compulsory.*
2. *Answers to the Sections B and C should be written in separate answer books.*
3. *Draw neat and labelled diagrams wherever necessary.*
4. *Figures to the right indicate full marks.*

Section B

II. Write short answers to the following questions: 20
(Each question carries 2 marks)
   a. Prophylaxis against infective endocarditis.
   b. Causes of secondary hypertension.
   c. Clinical features of thyrotoxicosis (hyperthyroidism).
   d. Bell's palsy.
   e. Clinical features of organophosphorus poisoning.
   f. Complications of acute viral hepatitis.
   g. What are the clinical features of a case of severe anaemia.
   h. Causes of Jaundice.
   i. Oral ulcers.
   j. Polio vaccine.

Section C

III. Write *long* answers to *each* of the following: 20
   a. Describe the pathogenesis, clinical features, complications of pulmonary tuberculosis. Write briefly about the short course treatment of pulmonary tuberculosis.
   b. What are the causes of ascites?
   Describe the clinical features, investigations and management of a case of cirrhosis of the liver.

Total No. of Questions: 6

2120 - 1
Third BDS
General Medicine

Time: 3 Hours] [Max. Marks: 60
NB:
1. *Answers to the two sections should be written in separate answer books.*
2. *Figures to the right indicate full marks.*
3. *All questions are compulsory.*

Section - I

1. Discuss clinical features and management of rheumatic fever. [10]
2. Discuss clinical features and management of malarial fever. [10]
3. Write short notes on any *two* of the following: [10]
   a. Mumps.
   b. Complications of diabetes mellitus.
   c. Aspirin.

Section - II

4. Discuss clinical features and management of protein calorie malnutrition. [10]
5. Discuss clinical features and management of essential hypertension. [10]
6. Write short notes on any *two* of the following: [10]
   a. Infective endocarditis.
   b. Beriberi.
   c. Nephrotic syndrome.

III BDS EXAMINATION, MAY 2002
GENERAL MEDICINE

Date: 21-5-2002 Total Marks: 60
Time: 2.30 pm to 5.30 pm

Section – B

II. Write short answers of the following: (Each question carries *two* marks).
   a. Clinical features of infective endocarditis.
   b. Causes of generalised lymphadenopathy.
   c. Definition and common causes of nephrotic syndrome.
   d. Management of upper GI Bleed.
   e. Enumerate preventive measures for adult HIV

transmission
f. Drug Therapy in status asthmaticus.
g. Enumerate non local causes of gingival hyperplasia.
h. Management of a case of acute myocardial infarction.
i. Treatment of uncomplicated malarial fever.
j. Drug therapy in primary syphilis.

Section – C **20**

III. Write *long* answers to the following questions (*10 marks each*)
a. What are the causes of iron deficiency? What are diagnostic tests? How will you treat a case of bleeding peptic ulcer?
b. Describe etiopathogenesis, risk-factors, clinical features and complications of pneumonia.

III BDS EXAMINATION, MAY 2003

GENERAL MEDICINE

Duration: 3 Hours Total Marks: 60

Section – B and Section – C

Instructions:
1. *All questions are compulsory.*
2. *The number to the right indicate full marks.*
3. *Draw diagrams wherever necessary.*
4. *Answer each Section in the respective answer sheet only.*
5. *Answers written in the inappropriate sectional answer books will not be assessed in any case.*

Section – B

2. Write short answers of the following. Each question carries two marks. 20
a. Clinical features of tetanus.
b. Drug treatment of falciparum malaria.
c. Treatment of gastric ulcer.
d. Four differential clinical features of Bronchial and cardiac asthama.
e. Treatment of thyrotoxicosis.
f. Clinical importance of urine examination.
g. Scurvy.
h. Treatment of neurosyphilis.
i. Eosinophilia.
j. Nifedipine.

Section – C

3. Write *long* answers to *each* of the following: 20
a. Give six common causes of ascites. Enumerate clinical signs of portal hypertension. Describe treatment of hepatic coma.
b. Enumerate causes of epilepsy. Describe clinical features, important investigations and treatment of grand mal epilepsy.

THIRD BDS EXAMINATION, JUNE/JULY 2004

GENERAL MEDICINE

Total Duration: Section A + B + C = 3 Hours
Section B and C Marks: 40

Instructions:
1. *All questions are compulsory.*
2. *The number to the right indicates full marks.*
3. *Draw diagrams wherever necessary.*
4. *Answers each Section in the respective answer sheet only.*
5. *Answers written in the inappropriate sectional answer book will not be assessed in any case.*

Section – B

2. Answer the following: (10×2=20)
a. Dysphagia.
b. Laboratory diagnosis of HIV infection.
c. Scurvy (clinical features and management).
d. Anaphylactic shock (Clinical features and treatment).
e. Bronchiectasis (Clinical features and investigations).
f. Clinical features and investigations of angina pectoris.
g. Clinical features and treatment of tetany.
h. Clinical features and treatment of an attack of convulsions.
i. Clinical features and investigation in Nephrotic Syndrome.
j. Clinical features and complications of thrombocytopenia.

Section – C

3. Write *long* answer: (2 × 10 = 20)
a. Describe the clinical features, diagnosis and management of acute left ventricular failure. Enumerate the causes of acute left ventricular failure.
b. Describe the etiology, clinical feature investigations and treatment of peptic ulcer.

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

SYLLABUS: THIRD BDS

Candidate will be examined in the following subjects:
1. General medicine.
2. General surgery.
3. Oral Pathology and microbiology.
4. Preventive and community dentistry.

Subject: **General Medicine**
Lectures - 40 Hours.
Clinicals - 90 Hours.
Total Duration 130 Hours

Lectures:

1. Aims of medicine.
2. Definition of diagnosis, prognosis and treatment.
3. History taking and physical examination of a medical case.
4. Medical emergencies in dental practice, Anaphylactic shock, hemophillia, syncope, cardiac anet, etc.
5. GI Disorders:
   Stomatitis, glossitis, gastritis, diarrhoea, amoebiasis, ascites, malabsorption syndrome, peptic ulcer.
6. Liver—Jaundice, viral hepatitis, cirrhosis of liver.
   Tender hepatomegaly.
7. Cardiovascular System:
   Congenital heart diseases, classification, rheumatic heart diseases, subacute bacterial endocarditis, congestive heart failures, left ventricular failure. Hypertension. Coronary artery disease.
8. Respiratory system:
   Pneumonia, bronchitis, emphysema, lung abscess. Eosinophilia, pulmonary embolism, pulmonary tuberculosis, respiratory failure, chronic obstructive pulmonary diseases.
9. Renal diseases:
   Nephritis, nephrotic syndrome.
10. Hematology:
    Anaemia, Coagulation defects, Bleeding disorders. Agranulocytosis, Leukaemia Oral manifestations of Hematological disorders, Lymphadenopathy and splenomegaly.
11. Central nervous system:
    Meningitis, facial palsy, facial pain, epilepsy, headache, vertigo, nervousness, anxieties and depression.
12. Nutritional and metabolic disorders:
    Balanced diet, normal daily requirements.
    Protein calorie malnutrition.
    Avitaminosis, diabetes mellitus.
    Calcium homeostasis, flouride and phosphorous metabolism.
13. Endocrine disorder:
    Thyroid-hypo and hyper, Pituitary-hypo and hyper, Parathyroid-hypo and hyper, adrenal-hypo and hyper.
14. Infection:
    Enteric fever, mumps, leprosy, diphtheria, syphilis, gonorrhoea, herpes, AIDS., hepatitis, Maleria fever.
15. Miscellaneous: Allergy, anaphylaxis, drug reactions, drug interactions, poisoning.
    Evaluation of a case for general anaesthesia. Case history and examination of patient. Diagnosis, prognosis and treatment planning.
16. Recent advances in general medicine.

I. Theory *60 Marks*

Theory (written) paper shall be of three hours duration.
Theory paper shall have three parts A,B and C

Section A: MCQ-Total 20 Marks.

20 multiple choice questions carrying one mark each
20 marks.

Section B : SAQ - Total 20 marks.
Ten short questions carrying two marks each
20 marks.

Section C : LAQ - Total 20 Marks.
Two long answer question carrying ten marks each
20 marks.
60 Marks.

II. Clinicals

A. Practical

Maximum		80 Marks
i. Long Case		35 Marks.
ii. Short Case		20 Marks.
iii. X-Rays and Drugs		20 Marks.
iv. Journal		05 Marks.
Total 80 Marks		

B. i. Oral (Viva voce) 20 Marks.
A+B = 100 Marks.

III. Internal Assessment (Theory 20+Practical 20) *40 marks*

Subject 2: General Surgery

Lectures	40 Hours
Clinicals	90 Hours

Appendix 2: Probable Theory Exam Questions for MBBS, BDS, MDS and MD

GENETIC FACTORS IN DENTAL DISEASES

1. Define genes, chromosomes and autosomes and describe any two syndromes causing dental abnormalities.
2. Discuss the importance of prevention of genetic disorders in dentistry.
3. Enumerate the congenital anomalies in oral cavity.
4. Discuss the oral congenital anomalies associated with mental retardation.
5. Write short notes on:
    1. Harelip and cleft palate.
    2. Tongue-tie.
    3. Hutchinson's teeth.
    4. Macroglossia.
    5. Bleeding gums.
    6. Trigeminal neuralgia.
    7. Hairy tongue.
    8. Angular stomatitis.
    9. Herpes labialis.
    10. Root canal.

IMMUNOLOGY

1. Discuss immunity, allergy and anaphylaxis stressing their importance in clinical practice.
2. What is accepted immunization schedule followed in practice.
3. Write short note on:
    a. Urticaria.
    b. Antigen and antibodies.
    c. Susceptibility.
    d. Passive immunization.
    e. Role of antibiotics in long-term prophylaxis.
    f. Spectrum of antibacterials used in clinical practice.

NUTRITION

1. Discuss the nutritional disorders in clinical practice.
2. Discuss fluoride metabolism and its use in preventive dentistry.
3. Write short note on:
    a. Vit. D resistant rickets.
    b. Renal rickets.
    c. Infantile scurvy.
    d. Wet beriberi.
4. Discuss the oral conditions caused due to avitaminosis.
5. Discuss the daily normal requirements of nutritional factors including the vitamins and minerals.

CVS

1. Discuss the cardinal presenting symptoms of heart diseases.
2. Discuss the value of examination of pulse and BP in case of cardiovascular diseases.
3. How the modern investigations help to reach the diagnosis in cases of heart disorders?
4. How will you react to the emergency of cardiac arrest in a patient at your clinic?
5. Discuss broadly the back ground of acute and chronic congestive heart failure and your policy and practice of therapeutic management.
6. What is rheumatic fever, its involving the heart and prospectus of prevention?
7. How the knowledge of coronary heart disease is useful in the clinical practice?
8. Classify hypertension and discuss the preventive aspect of complications arising out of them.
9. Discuss the common congenital heart diseases come across in clinical practice and how far relief can be given to those patient.
10. Write short note on:
    a. Endarteritis obliterance.
    b. Takayasu's syndrome.
    c. Raynaud's disease.
    d. Thrombophlebitis.
    e. Value of fundoscopy in diagnosis of cardio- vascular disorders.

DISEASES OF RESPIRATORY SYSTEM

1. Discuss the important signs and symptoms of respiratory diseases and their clinical value.
2. Write short note on:
    a. Clubbing.
    b. Pulmonary function tests.
    c. Oxygen therapy.
    d. Miliary tuberculosis.
    e. BCG.
    f. Pulmonary eosinophils.
    g. Cor pulmonale.
    h. Occupational lung diseases and how to prevent them.
3. What is spontaneous pneumothorax their varieties and management?
4. How will you differentiate pulmonary asthma from cardiac asthma and give their therapeutic aspects?
5. Discuss classification of pneumonias and your plan of treating their complications.

DIGESTIVE SYSTEM

1. How the disorders of teeth affect the health of systemic medical condition?
2. Write short note on:
   a. Dysphagia.
   b. Hiatus hernia.
   c. Achalasia cardia.
   d. Plummer-Vinson's syndrome.
   e. Ascites.
   f. Malabsorption.
   g. Piles.
   h. Hirschsprung's disease.
   i. Globules hystericus.
3. Discuss the geneses of peptic ulcer its possible complications and their management and prevention of recurrence.
4. How will you differentiate into various kinds of dysenteries, ulcerative, colitis and diverticulitis and discuss their management.
5. What are the diseases diagnosed or suspected by the examination of tongue.

HEPATOBILIARY

1. Discuss the problems of Jaundice and their management and prevention.
2. Write short note on:
   a. Biliary cirrhosis.
   b. Willson's disease (Hepatolenticular degeneration).
   c. Portal hypertension.
   d. Gallstones.
   e. Hepatic cirrhosis.
   f. Liver function tests and their clinical evaluation.
3. Discuss the syndrome of hepatic failure and its management and prognosis.

RENAL SYSTEM

1. What are the disease diagnosed/suspected by routine urine examination.
2. Discuss the complications of acute glomerulonephritis and its management.
3. Discuss the problem of renal failure and the modern approach to meet the challenge.
4. Write short notes on:
   a. Polycystic kidney.
   b. Wilms' tumor.
   c. Renal stones.
   d. Hematuria.
   e. Renal transplant.
   f. Modern investigative methods used to reach accurate diagnosis of renal disorders.

ENDOCRINE DISEASES

1. Write a short notes on:
   a. Acromegaly.
   b. Cushing's disease.
   c. Achondroplasia.
   d. Thyrotoxic crises.
   e. Exophthalmos.
   f. Goiter.
   g. Tetany.
   h. Addisonian crisis.
   i. Cryptorchidism.
2. Discuss the problem of diabetes mellitus, its complications and management.
3. Differentiate between diabetic coma and hypoglycemic coma and their management.
4. Discuss the etiology of diabetes mellitus, their early diagnosis and prevention.

HEMATOLOGY

1. Discuss the classification of anemias and outline their management.
2. Write short note on:
   a. Pregnancy anemia.
   b. Polycythemia vera.
   c. Agranulocytosis.
   d. Hypersplenism.
   e. Purpura.
   f. Blood transfusion and its hazards.
   g. Hodgkin's disease.
3. Discuss the spectrum of hemorrhagic disorders and their management in clinical practices.
4. Classify leukemias and how their management is useful and necessary in clinical practice.
5. Value of usual hematological investigations done for ascertaining the blood disorders and their merits of reliability.

DISEASES OF CONNECTIVE TISSUES, BONES AND JOINTS

1. Discuss the problems of rheumatoid arthritis and its management and how it differs from osteoarthritis?
2. Write short notes on:
   a. Still's disease.
   b. Sjögren's syndrome.
   c. Ankylosing spondylitis.
   d. SLE (Systemic lupus erythrometosis).
   e. Scleroderma.
   f. Gout.
   g. Paget's disease.

CNS

1. Enumerate cranial nerves and their various lesions and manifestation cum management and discuss their value in clinical practice.
2. Write short notes on:
   a. Vertigo.
   b. Epilepsy.
   c. Narcolepsy.

d. Migraines.
e. Subarachnoid hemorrhage.
f. Subdural hematoma.
g. Poliomyelitis.
h. Herpes zoster.
i. Sydenham's chorea.
j. Athetosis.
k. Ataxia.
l. Wernieke's encephalopathy.
m. Cervical spondylosis.
n. Kernicterus.

3. Enumerate various types of meningitis, their cardinal signs, symptoms and management.
4. Discuss myasthenia gravis with its therapeutic aspect.

PSYCHIATRY

1. What is psychometric medicine and how it is useful in clinical practice?
2. Psychiatry has become popular in educational, industrial and social fields of developed countries discuss why?
3. Discuss the legal aspect of mental disorders.
4. What are the minor psychiatric disorder including mental retardation come across in clinical practice and give short review of their management.
5. Discuss the systemic disorders causing dementia and discuss the prognosis thereafter.
6. Write short notes on:
   a. Hysteria.
   b. Amnesia.
   c. Delirium.
   d. Confusion.
   e. Insomnia.
   f. Sexual deviation.
   g. Addictions.
   h. Alcoholism.

TROPICAL DISEASES

1. Write short notes on:
   a. Sickle cell anemia.
   b. Heat stroke.
   c. Giardiasis.
   d. Rat bite fever.
   e. Dengue fever.
   f. Trachoma.
   g. Cysticercosis.
   h. Hyaloid disease.
   i. Elephantiasis.
2. Discuss the problem of malaria, its complications and management and prevention.
3. Discuss amebic dysentery, its complication, management as well as how do you differentiate from bacillary dysentery?
4. Discuss leprosy, its clinical manifestations, management and prevention.
5. How will you handle the epidemic of cholera?
6. How will you handle the epidemic of plague?
7. Discuss rabies its clinical features, diagnosis, and prevention.
8. Describe the complications of typhoid fever, their management and prevention.

LONG CASES

Valvular heart diseases

1. Mitral stenosis without or with regurgitation.
2. Aortic stenosis without or with regurgitation.
3. Hypertensions ……cardiac asthma.

CNS

1. Hemiplegia with or without speech disturbances.
2. Paraplegia.
4. Facial palsy.
5. Parkinsonism.

ENDOCRINE DISORDERS

1. Exophthalmoses thyrotoxicosis.
2. Addison's diseases.
3. Goiter.
4. Acromegaly.

DIGESTIVE DISORDERS

1. Hepatomegaly.
2. Splenomegaly, Portal hypertension.
3. Ascites.
4. Anasarca.

BLOOD DISORDERS

1. Anemia.
2. Purpura.
3. Vericose veins and thrombophlebitis.

RHEUMATOLOGY

1. Rheumatoid arthritis.

SHORT CASES

1. Squint.
2. Nystagus.
3. Mongolism.
4. Chorea.
5. Kyphosis, scoliosis.
6. Spondylitis.
7. Goiter.
8. Funnel chest.
9. Barrel chest.
10. Poliomyelitis.
11. Tremors.
12. Charcot's joints.
13. Clubbing.
14. Cyanosis.
15. Tumors.
16. Cleft palate.

17. Hare lip.
18. Bifid uvula.
19. Tongue tie.
20. Ptosis.

ORALS

To start discussion the following articles and specimens from pathology department on kept on the table.

1. Instruments (Surgical).
2. Catheters, Ryles tube.
3. BP apparatus.
4. Thermometer.
5. Temperature charts.
6. Ear washing metal syringe.
7. Trays.
8. Hemocytometer.
9. Slides under microscope—Malarial parasites, sickle cell anemia, leukemia.
10. Mounted pathology specimen
    a. Pulmonary TB.
    b. Gastric ulcer
    c. Ovarian tumors.
    d. Renal stones or stone in urinary bladder.
    e. Gallstones.
11. Typical X-rays
    Miliary TB, TB cavity.
    Lung cancer, gastric ulcer.
    Diverticulitis.
    Paget's diseases.
    Acromegaly.
    Deformed joints in rheumatoid arthritis.
    Tophi in gout.

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