

COMMON DENTAL DISEASES, PREVALENCE AND THEIR CAUSES AND DENTAL NEED FOR RURAL COMMUNITY OF PAKISTAN

Common Dental Diseases are: -

PERIODONTAL DISEASE

Periodontal disease is a commonest dental ailment inflicting the younger population in Pakistan and if uncontrolled, it involves the older people. Various research studies of W.H.O. and the study of the author show that most of the population from 12 to 17 years is suffering from different grade of periodontal disease. Hardly there is a person who is free from this ailment.

I. PREVALENCE OF THE DENTAL DISEASES

Day and Tandan (1940), Day and Shourie (1947) carried out studies at Lahore and found high incidence of periodontal disease among the younger age group. Similar studies of Metha et al (1953), (1955) carried out in India reveal the high incidence of this disease. Ramfjord (1961) investigated the rural and urban population of Bombay (India) and found 100% prevalence of the periodontal disease. Soofi (1962) studied school children at Quetta and found 85% of the population having periodontal disease. Likewise studies of the McCell (1953) who observed 90% of disease in U.S.A. Westin et al (1937) found 86.5% of gingivitis in Swedish school children. Saunders and Taylor (1930) noted 94% of gingivitis with Maori children in New Zealand. In the United Kingdom the incidence of the disease is likewise high, King (1940), (1945), Parfitt (1957), McHugh et al (1964), Sutcliffe (1968) and Sheiham (1960).

This has proved that the country is facing problem of periodontal diseases, especially in younger group which is evident from the epidemiological studies mentioned above. There is likelihood of increase of periodontal disease, if proper programme is not chalked out, to check the disease either by preventive methods or by curative means.

Periodontal disease involves the gingiva and other periodontal apparatus. The disease starts as an inflammation of the gingiva i.e. gingivitis, which leads to periodontal disease and that leads to early tooth loss, alongwith various ailments of general body and loss of taste of food.

Glickman (1967) explained that tooth loss due to periodontal disease become significant problem at the age of 35 years, but however, he mentioned that disease starts in early days; by 15 years of age, 4 out of 5 persons have gingivitis and 4 % periodontal disease is already present. In a population of 111 millions (in U.S.A.) at least 20 millions have lost all naural teeth and periodontal disease was present in 75% of the remainder. Glickman who is an authority on periodontal disease in the world, has mentioned that periodontal disease can be controlled by a local factor which are accessible, correctable and preventable. In most cases the gingivitis, the periodontal disease is preceded by inflammation, and he has mentioned that sole pathological process and local irritant combined with micro-organism are preferable cause for this disease.

The major causative factor for this disease is unhygienic condition in the oral cavity where bacterial plaque is formed Declan (1968) while finding culturable micro-organism he has taken a small plaque from periodontal pocket and found that : -

- a. Strept – Mitis 29.4 % of the total pocket flora
- b. Bacteriodes melanimogenicus 9.1% of the pocket floral
- c. Vibryo – fusiformus – spirochete and actinomyces

Were available. The secretions, out of this bacterial plaque, attacks the gingiva and the periodontal disease takes its start. The disease (gingivitis) takes its formation and if it is unchecked it goes deepend and after gingivitis, it involves the periodontal apparatus. Other studies also show that gingivitis is caused by local factor as compared to avitaminosis, blood dyscrasias or any other factors. The commonest sign and symptoms are redress of gingiva, bleeding from the gums, some times pain; in later stages pus oozes

out of the crevix of gums and teeth become shaky due to loss of alveolar bone, with the result: -

- a. Patient suffers from gums-ache
- b. Patient cannot eat food of his taste for fear of pain which leads to Law resistance of body.

Relation of Systemic, illness and chronic periodontal disease

The relation of systemic illness and chronic periodontal disease as focal of infection has long been demonstrated and referred to repeatedly in literature and numerous miscellaneous distrubances in the body have been considered due to presence of this disease. (Richards 1932) Roud et al (1936) Fish (1937), Winslow (1938), Murray (1941), Elliot (1939), Robinson (1950), Carrod et al (1960). If proper steps are not taken in planning Health Services for further checking of the dental ailment, the general health of the Pakistanis shall be affected as referred to above, the work of the various workers. Several authors have made relation between the bad gums and the general health (which should be discussed in separate article).

Prevention

- a. Cleanliness of the mouth after each meal is an important factor and use of tooth brush of the medium size is advised with any tooth paste. This shall:
-
 - (1) retard the onset of the gingivitis and shall reduce the incidence of the gingival disease.
 - (2) It shall improve the gingival health and produce stippling in the gingiva.
 - (3) It shall reduce the plaque and accumulate debris.
 - (4) It shall reduce the calculus formation.

- (5) It shall keep the patient away from visiting the dentist and last but the least it shall reduce the discomfort and improve the economy of the family, and
- (6) It shall keep the general health in proper condition.
- b. It is preferable that meals should be ended with fruit or piece of vegetable contrary to sweet dish. Regular visit to gum specialist after six months.

Treatment

Periodontal disease can be treated by advance method of science of periodontology and tooth loss can be prevented by personal care and by proper care of a dentist.

II. DENTAL CARIES

This is a second major dental disease. According to WHO (1962) dental caries is defined as localized post eruptive, biological process of external origin involving softening of the hard tooth tissue and proceeding to forming a cavity in a tooth. Whereas other people have defined it, dental caries is a disease of calcified tissues of the tooth caused by acids resulting by the action of micro-organism on carbo-hydrates; characterised by de-calcification of inorganic portion and accompanied by destruction of organic portion. Lesion is in outest portion of the teeth.

- a. **Forms of the Acids:**
Acids are derived from carbo-hydrates after they have been acted by the enzymes of microbial flora.
- b. **Micro-Organism:**
The common bacteria's, Lacto : Strepto: Diphth: Yeats, Staph, etc. These bacteria's are aggravated in a plaque which is formed by accumulation of the food debris and mucoid of the saliva and the carbo-hydrates in the diet.
- c. **De-calcification:**

De-calcification depends upon the degree of acid and the duration of contact with the teeth. Acid is potential to decalcify the teeth at 5.4 pH. Normally PH of mouth is 7.2 decalcification takes place after critical PH. 5.2.

d. **Substrate and Enzymal System:**

A suitable substrate enzymal system is essential for production of acids, mostly on monosaccharide and disaccharides. Since the commonest carbohydrates in the diet are starch and sucrose, with smaller amount of glucose and fructose. Thus quantitatively the important substrates which penetrate the plaque are sucrose and maltose. Disaccharide are splitted into monosaccharides before they are converted to the acids.

Sucrose	Invertase	Glucose	+ Fructose
Maltose	Maltase	Glucose	+ Glucose

Some times enzymes like invertase and maltase are available with any micro-organism. Thus plaque is confronted with the task of metabolizing mixture of sugar prominently glucose.

The glucose is broken down by some micro-organism in the presence of oxygen, glucose is metabolized to carbondioxide and w3ater, if the oxygen is removed, lactic and other acids may accumulate. Staphy-lococci and yeasts are responsible for breaking down the glucose to acid, just like in the muscle. The other organisms, like streptococci and lactobaccilli play an important role in the production of acid to disintegrate the surface of the tooth or forming a cavity. The bacterial plaque is major factor which influence the disintegration of the teeth.

Retention of the Acids:

The effect of caries process, on the tooth is by the circumstances in which the tooth retains environmental factors: -

a. **Dental Plaque**

An organic nitrogenous mass containing multitude of organism adhering to surface of the teeth.

b. **An anatomic Character:**

All teeth differ in their shape and form, some provide more chance for retention of acids in their fissures. Some time the position of the tooth is such that acids get more chance to disintegrate its outer surface for further destructing the organic material.

c. **Position or Arrangement of Teeth in Dental Arch:**

In certain cases the teeth are irregular and this mostly happens by wrong habits – hereditary and retaining of milk teeth in the mouth. When the teeth are irregular the acids get more chance for retention and the result is destruction of the teeth.

c. **Presence of Dental Appliances:**

Some time the dental appliances give a chance to acids for retention purpose. If they are ill-devised in wrong filling – dentures – arthodontic appliances – fixed crown and bridges, it also provide chance for retention of the acids and the caries could happen.

d. **Attitude of Individual Towards the Cleanliness:**

Each individual has got different attitude towards cleanliness of the oral cavity; some people are prompt and some do not clean their teeth with the result retention of the acids takes place and destruction of the teeth happens.

INHIBITORY FACTORS:

There are natural factors in mouth which contribute to dissipation of acid formation on the teeth e.g. an amount of saliva, composition i.e. organic or inorganic, PH, viscosity, antibacterial factors and buffering capacity. So all the factors correlates to caused dental decay i.e :-

Tooth:

Its :-

- a. Composition
- b. Morphology

- c. Position of the tooth

SALIVA AND DIET:

- a. Physical factor, quantity of diet etc.
- b. Local Factor: -
 - (1) Carbohydrate content
 - (2) Vitamin Content
 - (3) Fluorine intake and neglect of the individual help to cause the dental decay.

However, systemic condition do not very much effect the dental decay. It has been observed that diabetes, endocrine glands production, infectious disease and constitution and hereditary factor are not directly connected with the causation of the dental decay. However, they do influence otherwise.

Theory of the Caries:

- a. Acidic
- b. Proteolysis
- c. Chelation

Acidic Theory:

This is the oldest theory of dental caries which is still very much positive. According to this theory the cariogenic diet, provides adequate substrate for enzymic degradation.

Oral Microorganism:

In dental plaque microorganism convert the substrate into acids in such quantity and concentration to demineralise the enamel surface of the tooth.

Susceptibility of the Tooth Surface:

Stephan (1944), made observation which is positively convincing for rapid formation of the acids by the dental plaque. He found, there was a drop of pH in the dental plaque at 4.5 within 5 minutes after ingestion of glucose solution. The

pH returns to neutrality after 30 minutes. The production of acids contribute to carried process.

Proteolysis Concept:

Some workers suggested that the dental caries start with destruction of the enamel organic matrix and its process disintegrate the enamel like bricks wall collapse after removal of mortar. Frishic & Nuckolls (1947) believed that initial change was the proteolysis of the surface membrane and interprismatic protein of the enamel. Gollieb (1947) suggested that enamel lamellae were the site of caries initiation. However, hypothesis of caries of this nature is failed to demonstrate this process practically.

Chelation Theory:

The proponder of this theory pleads that initial demineralization of the enamel surface does not happen due to production of the acids by the substrate, acted upon micro-organism but doe to chelation process. Schaiz and Martin (1962) who are originator of this theory but could prove it otherwise. They could prove it theoretically and this concept failed to convince other workers.

Prevention of Dental Caries:

- a. By Patient
- b. By Dentist
- c. By the State; and
- d. By Social Organizations

a. **By Patient**

The patient can prevent the occurrence of dental decay and other ailments by self care, following the proper methods of tooth brush i.e. :-

- (1) before going to bed and after breakfast
- (2) he avoids sticky food before retirement; and
- (3) visits his Dentist by every 6 months for regular check up.

Patient's care and aptitude helps a lot in preventive programme:

Muller (1956) states that German dislike the idea of teeth extraction. Similarly in Switzerland parents are much more concerned with the childreenteeth and school dental service. There are special health education programmes. In Holand the people are also keen to prevent the loss of teeth due to dental decay. Newzealand's people are regular at use of tooth brush and preventive measures individually and collectively.

b. **By Dentist:**

A dentist can prevent the occurrence of dental decay by: -

- (1) the process of filling the cavity after application of his knowledge and skill by the use of instruments;
- (2) when a patient regularly visits him he just inform the patient about the pit or spot to be filled in time;
- (3) persuade his patient to be more careful and cooperative in preventing the dental disease as a part of dental health education.
- (4) The dentist should get out of his clinic and motivate the public or school children by demonstrating the means of prevention, causes of the dental decay and inform the patient about the coming pain or extraction in case the treatment is not carried out.

c. **By the State:**

The State and local authorities can pay an important role in preventing the disease by an introduction of dental public health measures in the country, school dental service in the educational institutions and regular check up as a part of medical fitness.

The State should encourage the public means of communications i.e. T.V., Radio and News Papers for preventive work. Most of the country of the old, even Iran has got the preventive organization in the country for preventive work. State can control the disease by proper water analysis and in case the Flouride salt is lacking in drinking water i.e. less than one part in one million parts of water the fluoridation is introduced.

d. **Private Agencies:**

In case the Government's resources are limited for introducing dental public health, Private Agencies like Red Cross, Material and Child Welfare Association, Family Planning, Pakistan Medical Association, Pakistan Public Health Association, APWA Organization can help in controlling and prevention of the dental decay by at least health education programme and setting of dental clinic at their own Organization.

Dental Aid for Rural Community of Pakistan:

The majority of population of Pakistan comes from rural areas and so far, no attention is being paid for dental care of this population either in any rural clinic or planning health centre or any employee dispensary by the previous Government, with the result that: -

- a. there is complete absence of dental public health aid in the rural areas;
- b. rural population is entirely ignorant about the dental health and its utility and importance; and
- c. lack of guidance, remains an immediate feature to the rural population.

The dental clinics have been designed by the Government mostly in District headquarter's hospitals. The population of all districts of Pakistan is so high that single dental surgeon cannot look after the public health, the health education or care of the school's children or any step for the rural community except he is busy in extraction of the teeth at district headquarters' hospital.

Dentistry

Dentistry is an over-growing profession expanding in knowledge and technique as a branch of general medicine. There are special branches but early need is that of dental public health or public dentistry. If it is introduced this shall benefit: -

- a. to a dentist which shall encourage him for a postgraduate training in public health;
- b. it shall benefit the population of the country;
- c. it shall help the designers for its expansion;
- d. it shall provide the involved modes and methods of research; and

- e. it shall provide a chance to collect and determine;
 - (1) Prevalence
 - (2) Type
 - (3) Extent
 - (4) Severity of the diseases in the community
- f. it shall also help us in making service to collect and provide information on dental condition of the community; and
- g. last but the least it shall provide us the data for our study in comparison to the data of the other countries of the world.

Needs of the Community:

The major needs of the rural community are: -

- a. immediate availability of the dental aid;
- b. relief of dental paid; and
- c. proper guidance and assurance for dental problems

However, the community does not need luxurious, costly and modern equipments with modern uniform of the dentist or Assistant. The community does not need English speaking persons with rude behaviour, with un-sympathetic attitude with non-affectionate feelings. But community needs, sympathetic attitude, affectionate feelings and man of moto of service to the human community to render service in an ordinary manner, in a ordinary room with ordinary field dental chair and ordinary room with small amount of medicines.

Knowledge about the Population in Pakistan

According to census of 1961 of Pakistan 86.9 % of the population lives in villages, whereas 13.1% dwells in urban areas. There are 35,412 villages in West Pakistan. 74.3% of the population is dependent on agricultural or pasture land.

Literacy rate is 15.9% for the whole country, 23.4 % males and 7.6% females are literate. The majority of the literate people live in cities and majority of the rural population are illiterate. There are 9,123,004 children between the ages of 5 to 14 years.

There are four provinces in Pakistan, 51 districts, 193 tehsils, 37067 villages, 3302 union councils and 23 cantonment boards whereas the Province of Punjab has got 19 districts, 72 tehsils, 103 towns, 42 health centres and 9 cantonment boards.

How to Get?

- a. Our country is facing financial difficulties;
- b. This is a developing country
- c. There is a dearth of qualified and experienced dentists
- d. The State cannot spend much of the budget on the foreign modern equipment's which cost about 50,000 to 60,000/- rupees for a clinic and last but the least our country is not rich to afford for luxurious equipment's.

Solution:

- a. At present there are about 120 unemployed dentists and the dental clinics so far are only attached to the district headquarters' hospital of Pakistan except at a few Tehsil Headquarters' hospital.

Government may start dental clinics at existing 72 tehsils of Punjab immediately. This shall help: -

- (1) Tehsil population
- (2) Unemployed qualified dentists will be absorbed; and
- (3) It shall be a complete medical aid- and barrier of dentistry and medicine shall break.

- b. **Dental Public Health School:**

Dental Public Health School may be established first at Lahore, then at other places like Hyderabad, Peshawar and Quetta to produce Dental Health Visitors or Dental Hygienists or Male Dental Health Workers. The course of curriculum should be of two years at par with Lady Health Visitors course. The facilities and the curriculum of instructions of public health dentistry can be utilized in collaboration with the Institute of Preventive Medicine. The course will be conducted under Public Health Department of the Province. This shall produce para-dental staff which shall be spread over in rural centres, in sub centres and in the primary and middle schools. These persons shall educate the people, guide them properly and shall do the minor and immediate treatment under the

supervision of Tehsil Dental Officers which shall eradicate the dearth of Dental Manpower.

c. **Cheaper Dental Clinics**

A field dental chair with cheaper equipments costing about 2000 to 3000 rupees can be installed in rural centres for rural population to solve their immediate problems.

Epidemiological Studies:

When the programme will be introduced the epidemiological study of the rural population shall be must which shall guide us for future planning of the dental aid.

Dental Act:

Government of Pakistan should enforce an Act that art and science for practice of dentistry should be in hands of qualified personnel. No person should be allowed to use the word doctor unless he is a Graduate from any University of the country. Similarly, the Dental Hygienist should not allowed to use the word doctor. They shall only work under the direct supervision of Dental Officer. It is further suggested that the present un-qualified person should be registered separately as un-qualified Practitioner dentist after constituting a committee of the experts to judge their ability for registration in that register.

Summary:

- a. Rural population needs immediate dental relief centre.
- b. Cheaper dental clinics are the proper answer under the present financial position of the country.
- c. Para-Dental schools should be started to produce the dental man-power.
- d. Preventive dentistry is a final answer.