

Official Newsletter of Institute of Public Health, Lahore

# IPH NEWS

## Public Health

Excellence in Higher Public Health Education

July 2015

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IPH News is published monthly by Institute of Public Health Lahore for non profitable educational purposes. Editorial correspondence to IPH News should be addressed to the Editor in-Chief, IPH News, Institute of Public Health, 6 - Abdur Rehman Chughtai (Birdwood) Road, Lahore, Pakistan. Tel. #: 092-42-99200708-99200906. Fax #: 092-42-99200868. website: [www.iph.punjab.gov.pk](http://www.iph.punjab.gov.pk) Printed and Published by the Department of Publications of IPH, Lahore.





## Basics of Dental Caries

Dr. Saira Talib

### Introduction

Dental caries is an infectious, communicable disease resulting in destruction of tooth structure by acid forming bacteria found in dental plaque, in the presence of sugar.

People living in same geographical area but belonging to different races have differing caries incidence. Generally, Chinese, blacks and Indians have lesser caries incidence than the Caucasian whites. Dental caries is more prevalent in children up to 12 years. Incidence decreases somewhat in younger & middle age groups. Incidence increases again by the older age. Incidence of caries is significantly higher in females than males. This may be due to the fact that teeth in females erupt earlier compared to males.

There appears to be heredity involved. Children of parents with low caries experience also show lesser caries incidence and vice versa.

### Contributing Factors

#### Structure & Composition of Tooth

This determines initiation and rate of progression of caries. Surface enamel is more mineralized than subsurface enamel and is more resistant to caries. It also accumulates more fluoride, zinc & lead ions than subsurface enamel. Therefore in initial carious lesions, the subsurface enamel shows marked demineralization even though the outer enamel is relatively intact.

Deep, narrow occlusal fissures or buccal and lingual pits predispose to caries as they tend to trap food and bacteria. Also enamel is quite thin at the base of such deep pits and fissures. Certain surfaces of teeth are more prone to decay like e.g. in mandibular 1st molars the likelihood of caries in descending order is occlusal, buccal, mesial, lingual and distal. The most susceptible teeth are mandibular 1st molars followed by maxillary 1st mandibular and maxillary 2nd molars.

Mal-aligned, rotated or otherwise abnormally situated teeth can be difficult to cleanse and are likely to trap food debris and bacteria. This, in susceptible persons is sufficient to cause dental caries.

#### Saliva

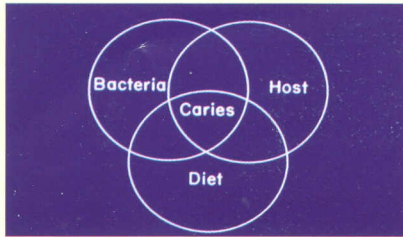
Many inorganic and organic components of saliva have been investigated for anti-cariogenic effects. However, results have been conflicting. In normal circumstances, saliva is supersaturated with calcium & phosphate ions with respect to enamel hydroxy apatite. This not only prevents enamel from dissolving but even tends to precipitate apatite in the surface enamel of carious lesions.

The "critical" pH at which the inorganic material of tooth begins to dissolve is about 5.5, since above this pH acid production during caries occurs at a localized site on tooth, which in initial stages at least, is covered by dental plaque. This plaque prevents a free exchange of ions.

Caries incidence is significantly higher in people with less or no saliva flow, as is seen in cases of salivary gland aplasia and xerostomia. Continuous flow of saliva is required for mechanical removal of bacteria and food debris from the tooth surfaces.

Sound scientific evidence is lacking to support the view that viscous saliva is associated with high caries incidence.

Saliva contains many antibacterial factors like lysozyme,



lactoferrin, IgA etc. However their efficacy has been doubtful as saliva always appears to contain bacteria capable of causing caries if carbohydrates are present.

#### Diet

The physical form of diet is a very important factor responsible for difference between caries incidence of primitive and modern man. Diet of primitive man contained plenty of roughage which mechanically cleaned the teeth.

Also, the coarse nature of the diet induced early attrition of occlusal and proximal surfaces leading to reduction in food entrapment. Diet of modern man in contrast is soft and lacks in roughage. As a result, food sticks tenaciously to teeth and is not cleansed mechanically.

Carbohydrate content of diet is accepted all over as one of the most important factors in caries process. It is observed that different ethnic populations have differing caries incidences – which could be due to difference in diet, especially carbohydrate content.

Diet of caries free ethnic races contains low amounts of carbohydrates, while diet of caries prone contains more carbohydrates due to intake of processed food. There are exceptions – certain populations in India have high carbohydrate content yet are relatively caries free.

Of all vitamins, only Vit D and Vit K appear to have some role in the caries process. Vit D may have an indirect effect on caries process. Its deficiency can cause enamel hypoplasia which can make the tooth more susceptible to caries. Vit K has enzyme inhibiting action in carbohydrate degradation cycle. It can be utilized as an anticariogenic agent.

Available evidence indicates that there is no relation between dietary calcium and phosphorus and dental caries. While topical and water fluoridation has been known to be effective in caries control, dietary fluorine may have no role as it is unavailable metabolically.

#### Systemic Factors

Racial tendency for high or low caries may be explained by heredity. However, local factors like change in dietary habits can change this tendency. Caries tendency may be inherited through tooth form & structure.

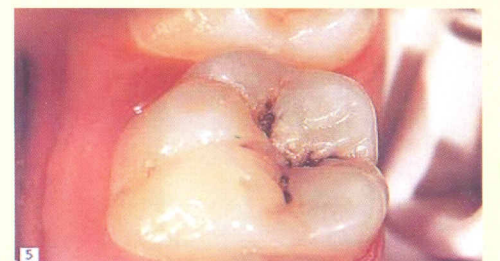
During pregnancy & lactation, women tend to neglect their oral health owing to all attention being diverted to the care of the newborn.

### Classification of Caries

#### Pit & Fissure Caries

This develops on occlusal surface of molars and premolars, buccal and lingual surfaces of molars & on lingual surface of maxillary incisors.

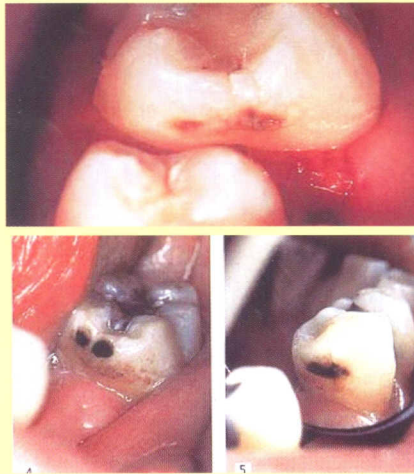
Deep pits and fissures are naturally more prone to caries due to their poor self cleansing properties & tendency to entrap food debris & bacteria.





## Smooth Surface Caries

This develops on proximal surfaces of all teeth or on gingival 1/3rd of buccal and lingual surfaces. Here, the caries is preceded by formation of dental plaque; presence of plaque ensures retention of carbohydrates and bacteria on tooth surfaces, leading to subsequent acid production and demineralization of enamel. Smooth surface caries usually begins just below the contact point and appears in initial stages as a faint white opacity of enamel without loss of continuity of enamel surface.



## Cervical Caries

Cervical caries occurs on buccal, lingual or labial surfaces. This lesion is a crescent shaped cavity beginning in its initial stages as a chalky white lesion. It almost always occurs as an open cavity unlike the smooth surface or pit and fissure caries. Caries occurs on all the teeth as it is directly related to lack of oral hygiene. There is no excuse for it to occur on anybody's teeth since it can always be prevented by maintaining good oral hygiene.



## Rampant Dental Caries

It is characterized by sudden, rapid destruction of teeth affecting even relatively caries free surfaces like proximal and cervical surfaces of mandibular teeth. 10 or more carious lesions over a one year period is characteristic of rampant caries.



Dietary factors like high carbohydrate intake as well as physiological factors affecting saliva are major contributors to etiology of rampant caries.

## Acute Dental Caries

It is that form of caries that follows a rapid clinical course and results in early pulpal involvement by carious process. It predominantly affects children and young adults probably because their dentinal tubules are larger and show no sclerosis.

## Nursing Bottle Caries

This is also called baby bottle syndrome and bottle mouth syndrome. It is a type of rampant caries and occurs due to nursing bottle containing milk, milk formula or sweetened water, breast feeding without oral hygiene and sugar or honey sweetened pacifiers. Usually, the above aids are used at sleeping time after one year of age. Clinically, this is seen as widespread caries of the 4 maxillary incisors followed by 1st molars and then canines.



Absence of caries in mandibular teeth distinguishes it from ordinary rampant caries.

If milk or other carbohydrates are rapidly cleared from mouth, they aren't cariogenic, but if they pool in the mouth, then they can cause rampant caries. Mandibular teeth usually escape the process as the pooled milk or sweet products are washed away by saliva.

## Chronic Dental Caries

It is that type of caries which progresses slowly and involves the pulp much later than acute caries. It is commonly seen in adults.

## Recurrent Caries

It occurs around or beneath an existing restoration, usually due to inadequate extension of restoration resulting in food impaction.



## Arrested Caries

It is that caries which becomes static or stationary and does not progress any further. It can occur in both deciduous and permanent dentition. It occurs almost exclusively on occlusal surface caries.



## Radiation Caries

It is rampant caries occurring in patients receiving radiotherapy in head & neck region.

Xerostomia is a major complication of radiotherapy of head & neck region. This, coupled with increase in viscosity and low pH of saliva results in decreased anticariogenic actions of saliva.

## Dental Public Health Department, IPH Lahore

### An Introduction

*Dental Public Health Department* was established in 1974 by Prof. M. A. Soofi (also ex Dean of IPH Lahore). The main aim of establishing this department was to educate and create awareness among general public regarding the importance of oral hygiene.

Knowledge about dental and gum diseases and treatment along with prevention of the diseases through dietary recommendations and maintenance of oral health is desirable.

Every year three dentists join IPH for post graduate courses who are trained by the team available in the same department. Dental department also provides school health services by visiting different schools to create awareness amongst children regarding usage of healthy food.

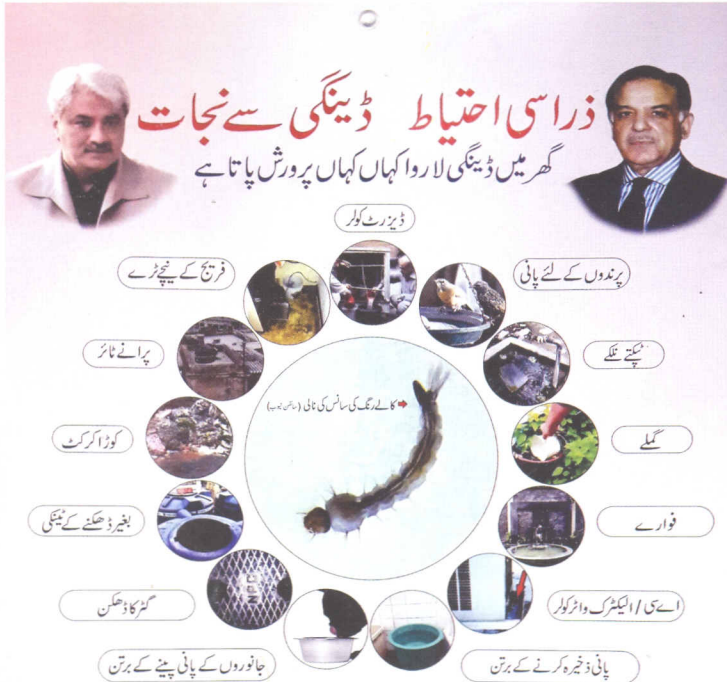
Dental outdoor department has an average of 30 to 40 patients per day.





## IPH Develops Calendar As Part of Dengue Awareness Activity

Dengue has made a stunning entry on the stage of public health in Punjab and is engaging a significant part of health budget each year. The government has been enthusiastic in



### Calendar 2015 / 2016

July   2015							August   2015							January   2016							February   2016						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4	30	31				1	31					1	2								
5	6	7	8	9	10	11	2	3	4	5	6	7	8	3	4	5	6	7	8	9	7	8	9	10	11	12	13
12	13	14	15	16	17	18	9	10	11	12	13	14	15	10	11	12	13	14	15	16	14	15	16	17	18	19	20
19	20	21	22	23	24	25	16	17	18	19	20	21	22	17	18	19	20	21	22	23	21	22	23	24	25	26	27
26	27	28	29	30	31	23	24	25	26	27	28	29	24	25	26	27	28	29	30	28	29						

each year. The health of the victims is at stake and Govt. of the Punjab has taken special initiatives to address this issue. In continuation of the same policy, the Secretary Health Punjab directed DGHS Punjab and Dean IPH Lahore to monitor health situation in the flood affected areas of Punjab and intervene timely to prevent epidemics. Health department established medical camps for the affected people which forwarded the data of all patients to the DGHS office within 24 hours through their respective EDO(H)s. The data was then forwarded to Disease Surveillance Team in which 3 IPH faculty members were included. A DSS report was generated on daily basis and epidemiological alerts were issued as needed. **Reported by Anjum Razzaq**

## IPH Conducts Anti Dengue Walk

As a part of routine anti dengue activities, IPH holds walks and seminars on the issue for awareness amongst its faculty and general public. This walk took place on 30th of July 2015 which was led by Dean IPH. **Reported by Zubair Latif**



## Routine IPH Activities During July 2015

Activities	No.
Vector surveillance of parks with ovitraps in Lahore	192
Vector surveillance of houses with ovitraps in Lahore & other Districts in Punjab	943
Dengue virus tests performed (IgM, IgG, NS1)	05
Persons receiving health education on dengue	1588
Clients receiving family planning services	37
Expectant mothers receiving antenatal care	73
Mothers receiving post natal care	09
Patients utilising public dental health services	122
International polio vaccination	58
Children receiving vaccination of :	
BCG	13
Pneumococcal	47
Pentavalent	47
Tetanus Toxoid	38
Oral Polio	60
Measles	19
Anti-Rabies vaccination given to dog bite victims	1255
Patients having sputum tested for AFB	576
Patients having sputum cultured for AFB	576
HIV Eliza	00
HIV Rapid	00
CBC tests performed	05
Infants & children receiving health care	184
Adults receiving health care	313
Water samples tested for faecal contamination	222
Daily report on dengue disease & surveillance	31

suppressing the advent of this disease with questionable success. One of the missing links in this tiring effort is the lack of community involvement. The masses are yet not convinced that preventing this disease is their problem and that the government is there to support them and not vice versa. Health education material distributed to the general public hardly finds its way into the homes and the life of such material may not be more than a few hours if not minutes. After much brainstorming on the issue, the IPH team decided to try printing calendars instead of pamphlets to motivate people to keep them in their houses for longer duration. The first one of this series is a calendar showing places where aedes larvae could be found in a household. The initial response to this health awareness tool was very impressive as people demanded for it and multiple reprints had to be ordered over a short span of time. IPH is planning to print multiple calendars on different awareness themes in near future. **Reported by M. Azeem Malik**

**IPH Conducts Disease Surveillance Analysis for Flood Struck Districts of Punjab**  
Natural disasters affect lives of millions of people in Pakistan