Diet and Plaque Control

Over the years the most common method used to prevent caries was by dietary control. Dental health education aimed at changing personal behavior was used to convince people to restrict their consumption of sugar.

Cariogenic food:

Foods that have the capacity to lower pH of plaque are acidogenic. Acidogenesis is a necessary condition for the development of caries. However this depends on a number of factors specific to the individual who eats acidogenic food namely:

- Predominant bacterial flora
- Flow rate and buffering capacity of saliva
- Fluoride availability
- Individual immune factors and,
- The quality and frequency of food eaten.

Sugars and starch have been proven to be cariogenic i.e. have the ability to foster caries in human under conditions conducive to caries formation.

SUGARS:

Sucrose is the lay term sugar, it is disaccharide most commonly used by humans. Sucrose and other sugars are added to processed foods.

High fructose corn syrup have now been introduced to the market and used instead of Sucrose by manufacturers because it is cheaper.

Cariogenecity of different Sugar:

Overall Sucrose is much more cariogenic than other sugars. However, little is gained in terms of caries reduction by substituting fructose or dextrose for Sucrose in food processing. This has only caused sharp reduction in a proximal and smooth-surface caries in America relative to the overall caries decline. This is because the production of extra cellular polysaccharide depends on Sucrose and that smooth surface caries can only develop with plaque that adheres by mean of extra cellular polysaccharides.

Also, there is no difference in cariogenicity between refined sugars and brown sugar.

Non cariogenic Sugar substitutes:

Non-caloric sugar substitutes are a big business. However, it is time consuming and expensive. Saccharine and aspartame have been available for some time. In dentistry the rational is that streptococcus mutans emerge in plaque flora when sugar substrate is plentiful but it can be suppressed when the diet is low in sugars.

Most commonly used sugar alcohol has been Sorbitol. It is sweetening agent in several "Sugarless" chewing gums and over the counter medicine.

Sorbitol's advantage over sugars in term of Cariogenicity is that in small amounts it does not lower the pH of plaque to the point where enamel demineralization occurs. It is low cariogenic rather non-cariogenic. In large quantities it may be cariogenic.

Xylitol is a prominent sugar alcohol. It is caloric but non-cariogenic. In the city of Turku Finland an experiment was done known as Turku Sugar Studies.

In this study the first group of volunteers had all their diet Sucrose substituted by Xylitol specially made by manufacturers. The second group consumed fructose sweetened food.

The third test group consumed sucrose containing diet. Over two years of the study there were practically no new carious lesions in the xylitol group, while there were seven in the Sucrose diet group and four in the fructose ones, lesions in the adult test subjects whose average age was 27.5 years were almost all of the "white spot" variety on smooth surface. The quantity of plaque formed in the xylitol group was also, significantly lower. More subsequent filed trials with xylitol-sweetened gum gave impressive results.

Cariogenic microorganisms can not metabolize Xylitol and this does not reduce the pH of plaque. The counts of s. mutans in saliva drops as a consequence of continuous use of xylitol as it starves the cariogenic microorganisms. Other studies also suggests that xylitol promote re-mineralization. It was found that partial substitution of xylitol for Sucrose as in confectionery is an effective means of caries prevention. Xylitol is not found much as it is thought to be carcinogenic. It is also much more expensive than Sucrose.

Cleansing and Protective Foods

Fresh fruits and vegetables have nutritional merits, and should be encouraged, however they have little or no effect on cleaning plaque from teeth surface and this prevent caries.

Cheese eating after meals has been shown to reduce the acidity of plaque, therefore its cariogenicity.

Control of Caries by Dietary Restriction:

In the pre-fluoride year's people were advised to strict intake of carbohydrates for caries control.

Now in the U.S., dietary guidelines urge the consumption of unrefined carbohydrates (e.g. fruits, potatoes, and whole grain).

In normal living populations there is no epidemiological evidence that consumption of sticky foods is more strongly associated with caries experience than are sugar drinks.

Health educators are advised to concentrate on reducing total sugar intake for caries susceptible people rather than fuss with sticky foods or details of snacking frequency.

On a community basis, dietary advice in dental health education should be linked with education on wise food choice for healthy living. Dietary guidelines now emphasize on refined carbohydrates from a variety of foods, moderate amounts of protein, and low fat. High-sugar foods are often high-fat foods as well, therefore dental advice is in harmony with broad advice to enhance public health.

Plaque Control:

In a series of reports in 1970 concluded that caries incidence in children could be virtually eliminated by meticulous plaque removal carried out by trained dental hygienist at frequent intervals. These reports are known as "Karlstadt Studies" after Swedish town in which they were conducted. In young children it was eight weeks after an initial two years, at two weeks intervals. Benefits from this protocol.

a) Plaque removal.
b) Intensive use of topical fluoride paste.
c) Dental health education and oral hygiene.
d) Caries reduction of 98% were reported over two years.

This is an expensive approach and unrealistic for public services. Caries prevention is for better focused with appropriate use of fluoride, this is easily done by regular tooth brushing by fluoride toothpaste. Plaque removal effect is secondary in caries prevention though it can have primary benefits in controlling gingivitis. This tooth brushing with fluoride toothpaste should be encouraged as a daily routine for all people.