المحاضره الاولى

المرحله الرابعه

Fluoride

It is a very important element in the prevention of dental caries , is a trace element (found in a very low concentration )which is about 1ppm (this is equal to 1 mg/liter) . In nature the conc. Of fluoride may reach level up to 10.000 ppm , it is found in sea water , river , rocks , ground, soil , vegetables.

Types of fluorides

Fluoride has 2 types of effects systemic and topical depending on the delivery method used ,

* Systemic fluorides provides a low concentration of fluoride to the teeth over a long period of time.
* It circulates through the blood stream and is incorporated into developing teeth.
* After teeth erupt, fluoride contacts teeth directly through salivary secretions.

Most systemic fluorides have a topical effect but their primary effect is systemic.

topical fluorides are placed directly on the teeth , some preparations provide a high conc. Of fluoride over a short time , topical fluoride allows interaction of fluoride with minerals in the teeth.

HOW DO SYSTEMIC FLUORIDES WORK

* Systemic fluorides are those that are ingested into the body and become incorporated into forming tooth structures.
* Systemic fluorides when ingested during tooth development are deposited to some extent throughout the tooth surface.
* However, the actual mechanism of action of systemic fluorides is from the topical protection as the fluoride present in saliva, which continually bathes the teeth, provides a constant source that is also incorporated into plaque and facilitates remineralisation.

TYPES OF SYSTEMIC FLUORIDES

1. water fluoridation
2. community water fluoridation
3. school water fluoridation
4. salt fluoridation
5. milk fluoridation
6. fluorides tablet ,dropes.

Community water fluoridation

* Water fluoridation is defined as “ controlled adjustment of the concentration of fluoride in a communal water supply so as to achieve maximum caries reduction and clinically insignificant level of fluorosis”.
* It can also be defined as “the upward adjustment of the concentration of fluoride in public water supply in such a way that the concentration of fluoride ion in the water may be consistently maintained at 1 parts per million(ppm) by weight to prevent dental caries with minimal possibility of causing dental fluorosis .”
* The water fluoridation is one of the most common delivery methods of fluoride.
* It presents a lower cost and long range.
* However for water fluoridation to be effective it has to be a continuous process and the concentration of fluoride has to be well controlled.
* The recommended concentration varies between 0.7 and 1.2 ppm, depending on the average regional temperature. a
* The lower levels of fluoride are recommended for warmer regions. In these locations the intake of water tends to be higher. The optimal level of fluoride in water for protection against dental caries is approximately 1 part per million. (ppm)
* Fluoridation is the adjustment of water supply to a fluoride content such that reductions of 50 to 70 % in dental caries would occur without damage to teeth or other structures.

ADVANTAGES OF WATER FLUORIDATION;

1. large number of people are benefited.

2 . Consumption is regular.

3. Fluoridated drinking water not only acts systemically

During tooth formation to make dental enamel more resistant to dental decay, but also has topical effect through the release in saliva after ingestion.

5. Fluoridation of community water is the least expensive way to provide fluoride to a large group of people.

6. It is safe.

SCHOOL WATER FLUORIDATION;

* School water fluoridation is one of the possible areas to be explored. This programme helps in limiting caries in school children who are the prime concern.
* It has been tested in area without community water fluoridation The amount of fluoride added In school drinking water should be greater than normal must be between (2.2-5 ppm) because children have to stay in the school for a short period of time and to compensate for holidays and vacations.
* ADVANTAGES

1. There has been around 35 to 40 % decrease in dental caries with this program

2. good results in reducing caries.

3. Minimal equipment .

4.Not expensive/person/year $ 1.5

5. Safe

6. Accepted by child

7. Technically feasible

8. No effort required by children

* DISADVANTAGES
  + Children do not receive the benefit until they go to school. i.e, 6 years of age
  + Not all children go to the school in poor countries and towns and villages.
  + Amount of water drunk can’t be regulated.

Fluoridated Salt

Salt fluoridation is a controlled addition of fluoride ,usually sodium or potassium fluoride ,during the manufacture of salt for human consumption.

HISTORY

* First fluoridated salt was introduce in Switzerland since 1955.
* Experiments have been conducted with concentration of fluoride in salt ranging from 90 mg /kg to 200 -350 mg/kg .
* Initial clinical clinical trial of 90 mg/kg fluoride salt showed 20- 25 % of reduction of dental caries.

In 1967 Muhleman showed the safe dose of fluoridated salt, that 300 mg/kg yields 1.5 mg fluoride/5 gm of salt. Tooth from Hungary, after 8 years of salt fluoridates at the level of 250 mg fluoride /kg reported 35-58% of caries reduction.

ADVANTAGES

* Fluoridated salt is safe.
* Theoretically fluoridated salt prevents dental caries by both systemic as well topical action.
* It does not require community water supply as in case of water fluoridation.
* It permits individual to accept it or reject it.
* Low cost
* Fluoridated salt and iodized salt can be made available to the population.

DISADVANTAGES

1. No precise control over indicated consumption, since salt intake varies greatly among people
2. Infants do not start administration from birth.
3. Less sodium (Na) intake to help control hypertension.

Fluoridated milk and fruit juice

* The nutritional value of milk has been well documented .and because milk is recommended as a good food for infant and children ,it has been considered as a suitable

Way for supplying children with fluoride in area with out fluoride in water.

* Milk is often available to children through school and nutritional programs and the use of such distribution systems can provide a convenient and cost efficient vehicle.
* Virtually all forms of milk products are suitable for fluoridation and the process is relatively simple.
* Milk fluoridation can be targeted at those communities in greatest need. Research has been demonstrated the effectiveness of fluoridated milk in preventing dental disease .
* Fluoridated milk is given under supervision in the school in order to control the amount of milk given to the child .F in milk is 1-1.5 ppm
* Some researchers found contraversal results the protein and calcium in the milk will only retard or delay absorption of F.in Stomach or prevent the topical effect of F milk.
* Fluoridated juice may used as an alternative to F milk
* In a study reported a 35% reduction rate in DMFS in 6-9 year olds children when they consumed 1mg F in 100 ml of pure orange juice(10PPM) Used in each school day for 3 years.

1. FLUORIDE SUPPLEMENTS

Fluoride supplements are available in different forms such as fluoride tablets ,drops , lozenges.

Fluoride tablets, drops and lozenges are not available over the counter but prescribed by the dentist or paediatrician to individual patients or as a part of school or home based preventive dentistry program. Most commonly used is sodium fluoride .

Other compounds used are acidulated phosphate fluoride, potassium fluoride or calcium fluoride.

Supplements contain measured amount of fluorides, 0.25 mg , 0.5 mg, 1.0 mg.

They should be taken on daily basis according to the prescribed dosage schedule.

The council of dental theraprutics of american dental association recommends the dosage schedule for dietry fluoride supplements as shown in the table :

AGE Fluoride conc. Of drinking water (ppm) WHO 1994

<0.3 >0.3<0.6 >0.6

0-6 months non non non

6 mon- 3 yrs 0.25gm non non

3 to 6 yrs 0.5 gm o.25gm non

6 to 16 yrs 1 gm o.5 gm non

Correct dosage is based on the concentration of fluoride in drinking water, age and weight of the child and other available fluoride.

 Not more than 1 milligram of fluoride should be ingested each day from all available systemic sources. The use of dietary fluoride supplements from birth to age 13 or 16 years provides caries reduction from 16-65 .

PRECAUTIONS

1.Accidental ingestion of fluoride supplements can cause stomach upset.

2. No more than 120, 2.2 mg sodium fluoride tablet should be dispensed at one time.

3. There is no risk of dental fluorosis if the proper regime is followed.

4. However, fluoride supplements when ingested prior to tooth eruption are a risk factor for dental fluorosis.