

CONSIDERATIONS REGARDING EARLY CHILDHOOD CARIES

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Early childhood caries (ECC) is a recent term that describes rampant dental caries in infants.

Terms describing this affliction have evolved during the last 20 years, and include names like nursing caries, nursing bottle caries and baby bottle caries (1).

Redefined as ECC, this affliction involves the presence of one or more decayed tooth surfaces (cavitory or non-cavitory lesions) and, or missing teeth due to caries or restorations of any deciduous teeth in children between 3-4 years of age or before 72 months.

The presence of any sign of cavity in children younger than 3 years old indicates severe ECC, S-ECC is also defined as "atypical", "progressive" acute rampant. In children between 3 and 5 years old the presence of one or more cavities, missing teeth due to cavities, the presence of fillings in the maxillary anterior teeth $> 1=4$ (for 3 years old), $>1=5$ (for 4 years old), $>1=6$ (for 5 years old) are signs of S-ECC (2).

This new term, ECC, reflects the multitude of factors involved in the etiology of ECC. Thus, efficient preventive strategies must focus on all risk factors that are involved.

The age of inception, the expansion tendencies, the immediate complications, the difficulty of the treatment, require the knowledge of the etiology of this disease to establish efficient preventive programmes.

In the appearance of baby bottle caries major carious causing factors are involved, but of major importance is when these factors interact each other.

Intrinsic factors

- a) Mineralisation defect of the enamel matrix.
- b) The alteration of saliva factors and biochemical composition of saliva.

Extrinsic factors

- a) Bovine milk can cause caries: either the sugar or the lactose can be involved
- b) The nature and frequency of liquid or solid foods rich in carbohydrates.
- c) The lack of salivary flow and viscosity of saliva.
- d) The lack attention on the part of parents with regards their children's hygiene.

The major cause of caries in early childhood is artificial bottle feeding. The bottle content is either sweet milk or another drink with sugar or honey (tea, syrup, juice). This practice is often associated with the absence of dental hygiene and many of these children don't benefit by fluoridation (3).

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An accepted fact today is that the group of cavity producing micro-organisms streptococcus mutans type is associated with ECC. The children with ECC have high oral levels of streptococcus mutans, often taken from the mother.

Streptococci mutans are taken between 19 and 39 months. There are also surveys that have determined the existence of streptococci mutans in the oral cavities at ages younger than 11 months or 12-16 months

There are also children that present carious lesions until the age of 11 months.

The lack of oral hygiene and improper feeding habits are associated with the development of caries in the childhood.

Because children are not capable of controlling these factors, their oral health is influenced by the level of education of their parents' habits.

Prolonged bottle and night feeding in infants provides the source of carbohydrates which permit high acid production of streptococci mutans.

A high risk of caries is presented in children on feeding bottle for more than 1 year (4).

A controversial problem area is regarding the potential carious risk or cariogenicity of breast feeding.

It is often said that breast feeding during night can be the cause of dental caries; having the same effect as allowing the child to fall asleep with the feeding bottle in his mouth. The breast milk "stay" because the baby has to be active and suckle feed. The sucking process also includes the swallowing process. The child need to

swallow everything before getting to the next step. It is important to mention that there still remains what is in the bottle in the oral cavity in children that use the bottle for drinking human or artificial milk, even though the activity of sucking has finished. If the child does't swallow the liquid can remain around the teeth (5).

Accordingly the article to published in "Journal of Pediatric Dentistry" in 1999, the human milk is not cariogenic. Finnish's studies show that there is no correlation between caries and breast feeding, in treatment of the caries for more than 34 months.

The prolonged breast feeding or bottle feeding can offer a favorable medium to bacteria growth and the formation of acid plaque. This plaque determines the reduction of oral pH and induces the demineralisation of enamel and may lead to cavity formation. Stagnation of milk at the level of anterior teeth and lactose dizaharide fermentation lead to caries formation.

Researches came to the conclusion that human milk doesn't decrease pH significantly in the oral cavity but almost all the artificial substitutes do.

The severity of this disease and the social costs are enormous. Caries prevalence at the age of 3-5 has been reported to be about 90%. There is obvious evidence that children with ECC present a high risk of new developing lesions both in their temporary and their permanent dentition, as they grow up. The high level of the risk of infection with cariogen microorganisms or the existence of deficient feeding habits

can be decisive in caries progression (6).

The clinical signs of early caries are:

- lower incisors relatively respected and upper incisors constantly involved;
- early inception;
- rapid progress of lesions on dental surfaces;
- dentinal cavities can appear brown, even blackish, unaesthetic, and can result in residual crown abutments;
- following hygienic and nutritional changes, lesions can be stabilized.

First signs of disease appear around 20-22 months in upper incisors. Initially, only a change in color can be seen, enamel being opaque white or dark brown at the gingival zone or oral surfaces of the teeth in bottle-feeding and oral and buccal surfaces for breast-feeding children (2).

Lesions are present either on buccal or oral surfaces near to the gingival margin or lateral surfaces; incisal margin is not involved, at least at the beginning of the process.

Caries spread progressively toward lateral teeth as deep cavities on occlusal surfaces, medium cavities on the buccal surfaces and superficial cavities on the parietal surface of first molars, afterwards, buccal surfaces of canines and finally the lower first molars.

Caries follow the eruption order teeth, thus after upper incisors next teeth involved are first molars, then canines and finally second molars. Lower incisors remain unaffected due to the protection offered by soft tissue and the salivary submandible as well as sublingual glands from the

neighborhood. Healthy lower incisors are a factor for differential diagnosis with rampant caries, another form of early caries of temporary teeth.

Generally, lesions evolve rapidly in depth and latitudinally on the surfaces without symptoms, don't respond to usual therapy, often destroy time crown integrity and affect pulp in a short period of time and finally only the stumps remain root rests on the arches. These can lead to frequent periapical complications, fistulas, through which unresorbed apex can be seen if poor child care are habits in changed.

Usually, symptoms become severe when important complications are manifested. Sometimes, a big ostetic process can get through buccal bone panel and a part of root can be seen coming out from gum (7).

Unfortunately, most of parents become concerned and take children to dentist very late, when teeth are already root rests with gingival or periapical abscesses or fistulas. Even in this situation, their concern is orientated towards an eventual involvement of permanent teeth.

Regard to this aspect correlation needs to be made between the gravity of losing alveolar bone and the level of development of replacing permanent teeth, explaining the implications.

The first step in the dental prevention caries should be counseling parents and children in matters of diet and dental health (8).

ECC prevention focused on educational programs to alter the feeding practices in children and to reduce the level of *S. Mutans* infection. An intensive

CONSIDERATIONS REGARDING EARLY CHILDHOOD CARIES

education program using manuals, counseling brochures, posters and leaflets with messages about feeding bottle caries can modify feeding types in children.

Prenatal, pregnancy and postnatal preventive program support for parents conscious-raising the effects of nursing bottle with sweet liquids on children's teeth. The goal is not to exclude the sugar from the diet but to determine a manner for patients to eat sugar in "an intelligent way" and that means a reasonable quantity of sugar at meal times. Thus, a "sugar discipline" can be obtained.

Among the four methods of dental caries prevention, which are flouridation, plaque control or hygiene, diet and sealing, the most important remain flouridation and diet. Strategies to reduce transmitting cariogenic microorganisms to child have been studied as measures for ECC prevention (9).

Supplementary methods for the development of a preventive behaviour in studies regarding the parents with children with high risk to ECC are necessary. Psychological methods of approach as increasing auto-efficiency and performing techniques of reaction can increase the confidence parents in their ability to fulfill recommendations and undertake healthy dental preventive behavior measures for their children.

Along with behavior modification techniques for changing poor habits, some preventive interventions, such as professional brushing, professionally recommended antimicrobial agents or fluorides, must be considered.

In conclusion, a better knowledge of the causes of ECC and promotion of effective strategies for decreasing risks would produce significant reductions in both long-term treatment costs and in the pain and suffering of affected children.

REFERENCES

1. Brown and col., 1985, and Lunt & Law, 1974, quoted by Tinanoff and O'Sullivan, 1997.
2. *** Centers for Disease Control and Prevention (CDCP): Conference Atlanta, GA, September 1994.
3. Ripa LW: *Nurising review*. *Pediatr. Dent.* 1998, 10: 268-282.
4. Arkin EB: *The healthymathers, healthybabies coalition: four years of progress*. *Public Health Rep*, 1996, 101: 147-156.
5. Bowen WH, Pearson SK: *Effect of milk on cariogenesis*. *Caries Res.*, 1997, 27: 461-466.
6. Brown JP, Junner C, Liew V: *A study of Streptococcus mutans levels in both infants with bottle caries and their mothers*. *Aust Dent J*, 1985, 30: 96-98.
7. Carisson J, Grohnén H, Jonsson G: *Lactobacili and Streptococci in the mouth of children*. *Cories Res*, 1985, 9: 333-339.
8. Serwint JR, Mungo R, Negrete VF: *Child - rearing practices and nursing caries*. *Pediatrics*, 1998, 92: 233-37.
9. Litt M, Reisine S, Tinanoff N: *Multidimensional causal model of dental caries development in low-income preschool children*. *Public Health Raports*, 1997, 110: 607-17.
10. Robert J Schroth, Michael EK Moffart: *Determinants of Early Childhood Caries (ECC) in a Rural Manitoba Community: A pilot study*. *Pediatric Dentistry*, 2005, 27, 2.