



EARLY CHILDHOOD CARIES: FEATURES, ETIOLOGY AND MANAGEMENT

Dental Science

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ABSTRACT

ECC is the most common chronic disease among young children and affects children less than 71 months of age, and they currently represent a public health problem in various countries worldwide. There are a multitude of risk factors associated with ECC. Feeding habits and a variety of biological, environmental, and socioeconomic factors are involved in the development of ECC. It can affect a child's well-being, learning ability, and quality of life. It is important to understand the natural history of ECC in order to implement effective preventive strategies.

KEYWORDS

Early Childhood Caries (ECC), Bottle Feeding, Fluoride, Food Habits, Restoration

INTRODUCTION

According to the definition of the World Health Organization (WHO), dental caries is a local pathological process of the extra somatic background, leading to enamel decalcification, decomposition of dental hard tissue, and in consequence to formation of a dental cavity.

Today world over tooth decay or dental caries is rapidly becoming the most common chronic childhood disease. According to the American Academy of Pediatric Dentistry; it is an international public hazard in both developing and developed nations. It can begin as early as the teeth erupt, usually around 6 months, and can progress fast causing pain and discomfort to the child. It also affects the esthetics, speech and growth of the jaw in the child (Baby bottle syndrome). It is a preventable disease if proper measures are taken on time and its prevention begins at the pediatrician's as they are the first point of contact for any child related disease parents go to. Although pediatricians are the ones in charge of promoting children's complete health, therefore this topic is of importance to medical practitioners as well.¹

According to the currently accepted concept caries is truly a multifactorial disease. Interaction between three primary factors namely host tissue-the tooth, microflora with cariogenic potential and suitable local substrate i.e. diet; is essential for initiation of caries disease process. However, Newbrun (1982) added a fourth factor "time" to the three above factors and the concept came to be known as "caries tetralogy". Saliva is also considered an important factor as teeth are in continuous contact with saliva. (Figure 1)

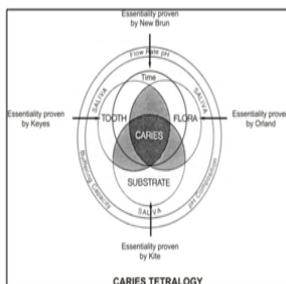


Figure 1: Caries Tetralogy

The American Academy of Pediatric Dentistry (AAPD) defines early childhood caries as the presence of one or more decayed (non-cavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child 71 months of age or younger. However, any sign of smooth surface caries, with or without cavity, in children younger than 3 years old, is considered severe early childhood caries (S-ECC). This disease has rampant, acute and progressive

characteristics. A child is also considered to have S-ECC if, from 3 to 5 years old, he/she has more than four, five and six dental surfaces affected in primary anterior teeth at 3, 4 and 5 years old, respectively. S-ECC replaces the previous term known as "nursing bottle caries."²

Classification of ECC

ECC can be classified as the following stages:

Stages of ECC

I. Mild to Moderate

White spot lesions can be seen on the incisors and molars

II. Moderate to Severe

One can find carious lesion on the labio- lingual aspect of the maxillary incisors with or without molar caries but mandibular incisors remain unaffected

III. Severe

In this stage we can see carious lesions involve almost all the teeth, including mandibular incisors.

SEQUENCE

There is a particular sequence that is followed:

Maxillary central incisors → Maxillary lateral incisors → Maxillary 1st molars → Maxillary canines and second molars → Mandibular molars → Mandibular canines and incisors

This particular pattern is usually seen as young children are bottle fed or breast fed. The feeding pattern affects the upper teeth first while lower incisors show signs of decay in the last as they are protected by the tongue.

CAUSATIVE FACTORS OF EARLY CHILDHOOD CARIES

The causative factors of ECC can be summarized as follows.^{3,4}

- I. Food habits:** play an important role in caries causing process. Consumption of high sugary foods and drinks are risk indicators for carious process. Also, there is lack of awareness about rinsing of mouth after every meal.
- II. Bottle feeding:** Breast feeding on demand, rather than ad lib, nocturnal feeding, bottle feeding with high sugar infant formula are some common causes of initiating early childhood caries.
- III. Socio economic status:** poor economic circumstances lead to lack of education and ignorance amongst parents. It has been generally seen children from lower belong to less educated communities, have increased prevalence to ECC.
- IV. Mutans Streptococci (MS):** MS maybe transmitted vertically from mother to child through salivary contact (through kissing, use of same utensils etc.). Children whose mothers have poor oral hygiene have a higher chance of maternal transmission of Mutans Streptococci (MS) and childhood dental caries.
- V. Plaque:** Visible plaque is strongly associated with high caries incidence. Early childhood caries was found most amongst children who did not brush their teeth.

Diagnosis of early childhood caries is both by visual and clinical examination of children who are at risk.

The **prevention of S-ECC** requires a multi-factorial approach due to its various etiological factors as summarized below:

- A. Good dietary practice guidelines should be given to new mothers to prevent ECC.
- B. Healthcare workers must prescribe sugar-free liquid medicines whenever appropriate.
- C. Toothpastes with fluoride concentration of 1000 ppm and above are efficacious in preventing caries. Children under 3 years should use a smear of toothpaste whilst those aged 3-6 years should use a pea sized amount of toothpaste.
- D. For high risk young children, a small amount of resin-based fluoride varnish can be applied at Intervals of 3 months or 6 months.
- E. Reinforce oral hygiene measures to reduce plaque and transmission of cariogenic bacteria.
- F. Collaboration with parents and other healthcare providers to ensure all infants and toddlers have access to dental screenings, counseling, and preventive procedures. Lift the lip once a month to look for early signs of decay on the surfaces of upper front teeth. Dental examination should be carried out by visual inspection with the aid of plane mouth mirrors to identify caries
- G. Children with special healthcare needs should be referred to a dental practitioner upon diagnosis in order that early diagnosis and preventive measures may be instituted.

MANAGEMENT

The management of S-ECC is affected by the extent of the carious lesions and the compliance of the child and parent.^{5,6}

Control of the Carious Process

An individualized caries risk assessment is the first important step in the management of S-ECC. It aims to modify the risk factors as discussed in the previous section.

Parents should be asked to wean off the child from using a bottle while in bed. In case of considerable emotional dependence on the bottle, suggest the use of plain water. In addition, parents are instructed to brush child's teeth last thing at night with fluoride toothpaste. For children aged 3-6

Maintenance of good dietary practices, good oral hygiene control as well as the use of fluoridated toothpaste is recommended for prevention of ECC. Chair-side topical fluoride varnish (2.2% F) application to teeth should be carried out twice yearly.^{7,8}

Stabilization of carious lesions

The second stage of management would involve stabilization of lesions. If the carious lesion is arrested, it should be monitored to ascertain that it remains in non-progressive stage until exfoliation. For non-cavitated proximal enamel lesions, a resin infiltration system used in conjunction with fluoride can be used to control caries progression on deciduous molar teeth.

Teeth that require temporization are excavated with spoon excavators and glass ionomer cement is used to seal the teeth. Temporization by sealing of the carious cavity after caries removal reduces the load of bacterial colonization in tooth.

When undertaking temporization, evidence shows of that sealing of partially excavated dentine caries is capable of arresting lesion progression, suggesting that complete dentine caries removal is not essential to control caries progression

Restorative Treatment

Restorative treatment of ECC is based on removal of caries and the treatment approach taken should take into consideration the child's risk factors and age. In addition, the choice of restorative material used can be influenced by a) site and extent of decay b) child's ability to cooperate c) longevity of the restoration.⁹

CONCLUSION

ECC is the most common chronic disease among young children and affects children less than 71 months of age, and they currently represent a public health problem in various countries worldwide. There are a multitude of risk factors associated with ECC. Feeding

habits and a variety of biological, environmental, and socioeconomic factors are involved in the development of ECC. It can affect a child's well-being, learning ability, and quality of life. It is important to understand the natural history of ECC in order to implement effective preventive strategies. Evidence of effective ECC prevention suggests prenatal and immediate postnatal interventions. Health care professionals should carry out children's caries risk assessments in their first year as part of the children's overall health assessments and children should be reassessed periodically over time. Population-based early childhood health systems hold great potential to reduce the burden of ECC, improve health care efficiency and cost-effectiveness. Early non-operative interventions by the dental professionals, including plaque removal, application of topical fluoride, and usage of sealants, are accepted as important steps for preventing of ECC. Cavitated ECC should be treated restoratively, although there is insufficient evidence to make recommendations about which material and technique is the most appropriate. Restoring is essential for making a significant difference on psychological and social aspects of the child's life.^{10,11}

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