Early childhood caries - Preventive strategies

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Introduction
Early childhood caries (ECC) is a virulent form of dental caries that can destroy the primary dentition of toddlers and preschool children (Fig. 1).

ECC is a syndrome with both disease and behavioral components. The colloquial term for ECC is “Baby Bottle Tooth Decay” because it is common in young children; a baby bottle, filled with liquids containing sugar, is used as a pacifier in aiding sleep or quietness. Untreated caries may lead to early loss of the primary dentition and affect the growth and maturation of the secondary, adult dentition.

Etiology
Caries is a common, complex, and chronic disease resulting from an imbalance of multiple risk factors & protective factors overtime. Fundamentally, caries is biofilm (plaque)-induced acid, demineralization of enamel or dentin, mediated by saliva. Caries is regarded as an infectious, contagious, and multifactorial disease produced by three primary individual factors: cariogenic microorganisms, cariogenic substrate, and susceptible host (or tooth) (Fig. 2). These factors interact for a certain period of time, causing an imbalance in the demineralization and remineralization between tooth surface and the adjacent plaque (biofilm).

Prevention
Dental caries is still the most common infectious disease among children. It is a preventable disease and its prevention begins at the pediatrician’s clinic. The dentists encourage oral health care providers and caregivers to implement preventive practices that can decrease a child’s risks of developing this devastating disease. Understanding the acquisition of cariogenic microbes is necessary to improve prevention strategy.

Prevention of ECC is done at different levels, e.g. it can be done at community level which relies on educating mothers in the hope of influencing their dietary habits as well as those of their infants. One can also examine and provide preventive care to the children in private clinics.

It is assumed that an increase in the knowledge, of mothers and caregivers at the community level basis, will influence their self-care habits and dietary practices in turn, improve the dietary and oral hygiene habits of the infants leading to the prevention of the ECC. Many cross-sectional studies have been done to determine the efficacy of educating people at this level which concluded with a modest positive change achieved in the dietary and personal health behaviors of infants at risk of developing ECC.

All infants and toddlers, regardless of their risk status, could benefit from water fluoridation. Water fluoridation has been found to be highly effective (40-60%) in a cross-sectional study in preventing the dental caries in the primary dentition. Furthermore, it has been found to be more effective in preventing dental caries in children from low socio-economic groups which are at high-risk of developing ECC.

While the preventive strategies, at the professional and home level, are not well known by the parents and caregivers, all infants should receive an early dental examination at or before the age of 1 year as recommended by the American Academy of Pediatric Dentistry. Early screening could help in the early identification of incipient carious lesions on smooth tooth surfaces. Additionally, early dental visits provide an opportunity to review feeding and oral hygiene practices and to plan professional fluoride applications.

Study findings support the use of fluoride varnish to prevent ECC and reduce caries increment in very young children. Fluoride varnish efficacy, in this age group, provides the additional rationale for an early dental visit, especially for the high-caries-risk children, since the application of fluoride varnish at this first visit will help reduce future disease (Fig. 3). If applied twice a year, fluoride varnish can reduce decay in baby teeth by 55% & by 46% in the permanent teeth. It is usual to apply fluoride varnish to the teeth of children who already have decayed teeth or are considered to be at increased risk of developing tooth decay.

One approach is to prevent S. mutans from accumulating to pathologic levels through the topical application of antimicrobial agents. The high-risk groups could benefit from the application of chlorhexidine varnishes. A varnish, containing 1% chlorhexidine and thymol, was found to reduce dental caries in the fissures of permanent molars by 50%. Chlorhexidine varnishes may be useful in preventing the transmission of cariogenic bacteria from mothers to infants. A chlorhexidine varnish could be easily applied to infants and toddlers and does not require the same level of moisture control as sealants. Bimonthly topical application of a 10% providone-iodine solution, to the dentition of babies at high risk for ECC, increased disease-free survival.

Finally, for high-ECC-risk infants and toddlers, a special pacifier containing fluoride (0.25 mg), xylitol, and orbital could be efficacious in controlling dental caries. Xylitol-containing gum is effective in preventing dental caries in primary teeth, though it is impractical for use in infants and toddlers. For infants and toddlers, a pacifier, containing xylitol, is a novel idea that could be used as a temporary substitute for feeding at night or bed time or for a pacifier laced with sugar.

Another promising approach toward primary prevention of ECC is to develop strategies that target the infectious component of this disease, for example, by preventing or delaying primary acquisition of S. mutans at an early age through suppression of maternal reservoirs of the organism. There is evidence that cariogenic bacteria (mutant streptococcus mutan) are transmitted from mothers to infants. The goal of primary prevention is to decrease or postpone the transmission of mutant streptococcus mutan from mother to child. This goal can be achieved by cutting the main routes of transmission (e.g., pacifiers, spoons) and by suppressing the levels of mutant S. mutan in highly infected mothers.

Preventive programs target- ing mothers have been implemented during pregnancy or when the infants were 5 to 8 months of age, with evaluation on a long-term basis. The controlled studies have generally included dental treatment, oral health information, and counselling as well as topical treatments of the mothers with various antibacterial agents, such as chlorhexidine, fluoride for the bacterial suppression.

Conclusion
ECC is characterized by severe decay in the teeth of infants or young children. As we know, ECC is a multifactor disease like any other form of caries involving three primary factors. To prevent development of any carious lesions, the primary caretakers are advised to check their baby’s mouth regularly by lifting the lips and cheeks on both sides. Also, parents should be educated about the feeding habits and the precautions to be taken while feeding their baby.

Prevention of cariogenic feeding behaviours is one approach to prevent ECC. Always clean the baby’s teeth with warm-wet-cloth after feeding, and begin brushing teeth as soon as the first tooth erupts. And most importantly, if the mother or caretaker first notices any discoloration of teeth, they should immediately approach the dentist for timely intervention.†

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