REVIEW ARTICLE

Oral Health in Children - Guidelines for Pediatricians

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Dental caries in the primary dentition can have significant damaging effects on a child's growth due to impairment of oral functions. Since the first encounter of a child to a medical environment is often through pediatricians and medical practitioners, it is important that they be aware of the prevention of oral disease that begins early in life. The aim of this article is to diminish the existing ambiguity among pediatricians and medical practitioners regarding oral disease and its prevention.

Key words: *Children, Counseling, Infant, Oral health*

Primary care physicians are in a unique position to ensure that parents and other caregivers receive information on the prevention of oral disease in infants and young children. By working together, pediatricians and dentists can reinforce each others' efforts to provide excellent preventive oral care.

Oral disease, especially dental caries, is complicated and multifactorial, and it often begins to develop during infancy. Caries is a biofilm (plaque) induced acid demineralization of enamel or dentin, mediated by saliva(1). The *Mutans streptococci* group of microorganisms has been implicated as the principal bacteria responsible for the initiation of dental caries in humans. It has been further shown that dental caries is an infectious, transmissible disease(2). Recent evidence suggests that Mutans group of bacteria may begin to colonize prior to tooth eruption(3,4). Ideally, steps to prevent caries begin prenatally and continue with the mother and child, beginning when the infant is approximately 6 months of age, with the eruption of the first tooth(5). A healthy mouth, with a full complement of teeth and a stable, aesthetic occlusion is a goal that pediatric dentists seek to achieve through various preventive and therapeutic measures.

PREVENTION OF DENTAL DISEASE

If appropriate measures are applied early enough, it may be possible to totally prevent dental caries. Preventive measures can be divided into various stages:

A. Stage 1 - Pregnancy

Infant oral health begins with prenatal oral health counseling for parents. The purpose of this is to generate awareness among parents about dental disease, its prevention and the means to provide a suitable environment for the child to develop.

Prenatal counseling

Evidence supports that both poor nutrition and low birth weight are risk factors for the development of early childhood caries (ECC). ECC is an early arising, potentially devastating and virulent form of dental caries. Not only does ECC affect teeth, but it can also leads to malnutrition and diminished quality of life due to resulting pain, infection and impairment of oral function.

Under- or malnourished infants and infants with low birth weight are at risk for enamel hypoplasia, an incomplete formation of enamel(6-8). Enamel

hypoplasia may cause an irregular enamel surface or discoloration, which can result in areas more prone to caries(6,9). Thus, expectant mothers should be advised to optimize nutrition during the third trimester and the infant's first year, when the enamel is undergoing maturation. Further, recent studies have reported an association between maternal periodontitis and preterm birth(10), between clinical periodontitis at delivery and preeclampsia(11), and between *Mutans streptococcus* levels in mothers and caries experience in their children(12).

Prospective parents need to know that prenatal assessment and education are essential to the oral health of their child. Prenatal assessment includes oral health status of the parent. The parent's risk of dental caries needs to be evaluated since uncontrolled caries means that the parent has a high level of Mutans streptococcus, which can be transferred to the infant later. If the parent is at risk, the dentist should provide preventive treatment and educate the parent on good plaque control, provide nutritional counseling, and discuss the transmissibility of Mutans streptococcus to the infant. Parents should be monitored on a regular basis to ensure effective oral hygiene and dietary habits have been established. Improvement of the mother's oral hygiene, diet and the use of mouth rinses can have a significant impact on the child's caries rate in the future.

Anticipatory guidance

Anticipatory guidance is the process of providing practical, developmentally appropriate information about children's health to prepare parents for the significant physical, emotional and psychological milestones(13). Anticipatory guidance involves three types of tasks: (1) gathering information, (2) establishing a therapeutic alliance, and (3) providing education and guidance. General anticipatory guidance for the mother includes the following (14-16):

(*a*) Education concerning development and prevention of dental disease and also demonstration of oral hygiene procedures.

(*b*) Counseling to instill preventive attitudes and motivation.

(*c*) Providing information to pregnant women about pregnancy gingivitis (inflammation of the gingiva caused by an exacerbated response to dental plaque, related to hormonal changes during pregnancy). With gingivitis, the gums become inflamed, swollen, sensitive and tend to bleed. Signs of gingivitis may become evident in the second trimester and peak during the ninth month of pregnancy(10).

(*d*) Visiting a dentist for an examination and restoration of all active decay as soon as feasible and to decrease chances of developing pregnancy gingivitis.

(*e*) Eating healthy foods such as fruits, vegetables, grain products (especially whole grain), and dairy products (milk, cheese) during meals and snacks. Limit eating between meals.

(*f*) Eating foods containing only sugar at mealtimes, and limiting the amount. Frequent consumption of foods high in sugar, such as toffees, cookies, cake, sweetened beverages (e.g fruit juice, soda), increases the risk for tooth decay. In addition, frequent consumption of foods that easily adhere to the tooth surface, such as dried fruit and candy, increase the risk for tooth decay.

(*g*) Brushing teeth thoroughly twice a day (after breakfast and before bed) with a fluoridated toothpaste and flossing daily.

(*h*) Rinsing every night with an alcohol-free, over-the-counter fluoridated mouth rinse.

(*i*) Not smoking cigarettes or chewing tobacco.

Dental treatment of women during pregnancy

Often, pediatricians are asked for advice regarding dental problems. Relevant information regarding the type of dental treatment that can be undertaken may be summarized as follows(14,17):

First trimester: It is the most crucial period for growth of fetus. *Only* emergency dental treatment should be undertaken in consultation with the patient's physician.

Second and third trimester: Emergency as well as elective dental treatment can be provided.

Radiographs essential for diagnosis can be obtained with adequate protection (e.g. lead shields).

Throughout pregnancy: Plaque diet control programs are initiated for mother. Local anesthetics are to be preferred for dental procedures.

B. Stage 2 - Infancy (0-1year)

Children experiencing dental caries as infants or toddlers have a much greater probability of subsequent caries in primary or permanent dentition(18,19). The major reservoir from which infants acquire Mutans streptococcus is their mothers (vertical transmission). Mothers with dense salivary reservoirs of Mutans streptococcus are at high risk for infecting their infants early in life. Horizontal transmission (between members of a family or group) can also occur(12). Eliminating saliva sharing activities can thus reduce the development of caries in infants. Moreover, high-risk dietary practices are developed early, probably by 12 months of age and are maintained throughout childhood(20,21). Frequent bottle-feeding at night, breast feeding on demand and extended use of a no-spill training cup are associated with development of early childhood caries (ECC) (22). Oral hygiene maintenance in this phase includes(23):

1. Reducing the mother's and sibling(s) levels of Mutans Streptococcus (ideally during the prenatal period) to decrease transmission of cariogenic bacteria. This can be accomplished through regular toothbrushing, use of fluoridated mouthrinses and treatment of all decayed teeth.
2. Minimizing saliva-sharing activities between an infant or toddler and his/her family. Avoiding testing of the temperature of the bottle with the mouth and sharing utensils (e.g., spoons). This practice helps to prevent transmission of bacteria that cause tooth decay.
3. Prior to eruption of teeth, wrap a moistened gauze square or washcloth around the index finger of the hand and gently massage the teeth and gingival tissues. Do not use a dentifrice (toothpaste) containing fluoride, because fluoride ingestion is possible.
4. Prolonged bottle or breast feeding provides an environment that enhances the development of early tooth decay. Infants should be weaned from the bottle at 12 to 14 months of age.

Dental home concept

The dental home concept(14,24) was developed analogous to the concept of 'medical home'. The dental home is inclusive of all aspects of oral health that result from the interaction of the patient, parents, nondental professionals, and dental professionals. The dental home concept fits well with the emphasis on comprehensive care that exists in pediatric dentistry programs. Establishing a dental home should be done within 6 months of eruption of the first tooth and no later than 12 months of age.

C. Stage 3 - First Dental Visit

The American Academy of Pediatric Dentistry recommends that the first oral examination should occur within 6 months of the eruption of the first primary tooth, and no later than age 12 months of age(24). Thereafter the child should be seen according to a schedule recommended by the dentist, based on the child's individual needs and susceptibility to disease.

D. Stage 4 – Care of the Deciduous Dentition

Oral hygiene measures must be implemented no later than the time of eruption of the first primary tooth. These measures include the following(23,25):

- If an infant falls asleep while feeding, the teeth should be cleaned before placing the child in bed.
- Toothbrushing of all dentate children should be performed twice daily with a fluoridated toothpaste and a soft, age-appropriate sized toothbrush.
- Parents should use a 'smear' of toothpaste to brush the teeth of a child less than 2 years of age and perform or assist with their child's toothbrushing.
- For the 2-5 years old child, parents should dispense a 'pea-size' amount of toothpaste and perform or assist with their child's toothbrushing. Children should be taught to never swallow the toothpaste.

- Dental flossing should be initiated when adjacent tooth surfaces cannot be cleansed by a toothbrush.
- Brushing should be supervised and assisted until age 8. A small, circular scrubbing motion is recommended for children.

Caries-promoting feeding behaviors that must be avoided are(1,23):

- Infants should not be put to sleep with a bottle containing fermentable carbohydrates.
- At-will breast-feeding should be avoided after the first primary tooth begins to erupt and other dietary carbohydrates are introduced.
- Parents should be encouraged to have infants drink from a cup as they approach their first birthday. Infants should be weaned from the bottle at 12 to 14 months of age.
- Repetitive consumption of any liquid containing fermentable carbohydrates from a bottle or training cup should be avoided.
- Between-meal snacks and prolonged exposures to foods and juice or other beverages containing fermentable carbohydrates should be avoided.

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