Policy on Early Childhood Caries (ECC): Unique Challenges and Treatment Options

Originating Council
Council on Clinical Affairs

Review Council
Council on Clinical Affairs

Adopted
2000

Revised
2003

Purpose

The American Academy of Pediatric Dentistry (AAPD), to promote appropriate, quality oral health care for infants and children with early childhood caries (ECC), must educate the health community and society about the unique challenges and treatment options of this disease. This policy will not attempt to duplicate information found in the AAPD's Clinical Guideline on Infant Oral Health Care.[1]

Methods

The proceedings of the Conference on Early Childhood Caries held in Bethesda, Md in October, 1997 were reviewed. A MEDLINE search was conducted using the terms "early childhood caries", "nursing caries", and "bottle caries".

Background

ECC is defined as "the presence of 1 or more decayed (noncavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces" in any primary tooth in a child 71 months of age or younger.[2] In children younger than 3 years of age, any sign of smooth-surface caries is indicative of severe early childhood caries (S-ECC). From ages 3 through 5, 1 or more cavitated, missing (due to caries), or filled smooth surfaces in primary maxillary anterior teeth, or a decayed, missing, or filled score of $\geq$4 (age 3), $\geq$5 (age 4), or $\geq$6 (age 5) surfaces constitutes S-ECC.[2]

ECC, a serious public health problem, is prevalent in low socioeconomic groups but also is found in the general population. It can be a particularly virulent form of caries, beginning soon after dental eruption, developing on smooth surfaces, progressing rapidly, and having a lasting detrimental impact on the dentition. Children experiencing caries as infants or toddlers have a much greater probability of subsequent caries in both the primary and permanent dentitions.[3,4] Not only does ECC affect teeth, but consequences of this disease may lead to more widespread health issues.[5] Infants with ECC grow at a slower pace than caries-free infants. Some young children with ECC may be severely underweight because of associated pain and the disinclination to eat.

Prevention of ECC begins with intervention in the prenatal and perinatal periods.[6] Women should be advised to optimize nutrition during the third trimester and the infant's first year, when enamel is undergoing maturation. Enamel hypoplasia is common in children with low birthweight or systemic illness in the neonatal period.[7,8] There is considerable presumptive evidence that malnutrition/undernutrition during the perinatal period causes hypoplasia.[9] A consistent association exists between clinical hypoplasia and ECC.[7,10] Cariogenic bacteria (specifically mutans streptococci) may be transmitted to the child; decreasing the mother's/primary caregiver's mutans streptococci levels may decrease the child's risk of developing ECC.[5,11-13]

Frequent bottle feeding at night, breast-feeding upon demand, and extended and repetitive use of a no-spill training cup are associated with, but not consistently implicated in, ECC.[14] Because poor feeding practices alone will not cause caries, previously used terms such as "baby bottle tooth decay", "bottle mouth", and "nursing decay" are misleading. ECC is a term that better reflects the multifactorial etiologic process.

When very young children have not been the beneficiaries of adequate preventive care and, subsequently, develop ECC, therapeutic intervention should be provided by a practitioner with the training, experience, and expertise to manage both the child and the disease process. Because of the aggressive nature of ECC, treatment should be definitive yet specific for each individual patient. Conventional restorative approaches may not arrest the disease.[15] Areas of decalcification and hypoplasia can rapidly develop cavitation. The use of anticariogenic agents may reduce the risk of development and progression of caries. Alternative restorative treatment (ART) techniques, using materials such as glass ionomers that release fluoride, hold promise as both preventive and therapeutic approaches.[15] Aggressive therapy, including the placement of stainless steel crowns, may be necessary to arrest the carious process. Stainless steel crowns decrease the number of tooth surfaces at risk for new or secondary caries and are less likely than other restorations to require retreatment.[16,17] Low levels of compliance with follow-up

care and a high recidivism rate of children requiring additional treatment can also influence a practitioner's decision for more aggressive restorative approaches to ECC.

The extent of the disease process as well as the patient's developmental level and comprehension skills affect the practitioner's behavior management approaches. To perform treatment effectively and efficiently while instilling a positive dental attitude, the practitioner caring for a child with ECC often must employ advanced behavior management techniques. These may include medical immobilization and/or sedation or general anesthesia. The success of restorations may be influenced by the child's response to the chosen behavior management technique. Although general anesthesia may provide optimal conditions to perform restorative procedures, it can add significantly to the cost of care. General anesthesia, under certain circumstances, may offer a cost-saving alternative to sedation for children with ECC.[18]

Policy statement

The AAPD recognizes the unique and virulent nature of ECC. Dentists who diagnose ECC should either provide therapy or refer the patient to an appropriately trained individual for treatment. Immediate intervention is necessary to prevent further dental destruction, as well as more widespread health problems. Because children who experience ECC are at greater risk for subsequent caries development, aggressive preventive and therapeutic measures such as ART, regimented applications of topical fluoride, and full crown coverage often are necessary. The dental care provider must assess the patient's developmental level and comprehension skills, as well as the extent of the disease process, to determine the need for advanced behavior management techniques such as medical immobilization, sedation, or general anesthesia.

References

1. American Academy of Pediatric Dentistry. Clinical guideline on infant oral health care. Pediatr Dent 2003;25(suppl):54.
2. Drury TF, Horowitz AM, Ismail AI, Haertens MP, Rozier RG, Selwitz RH. Diagnosing and reporting early childhood caries for research purposes. J Pub Health Dent 1999;59:192-197.
3. Proceedings. Conference on early childhood caries, Bethesda, Md. October 1997. Comm Dent Oral Epidemiol 1998;26(suppl).
4. Helfenstein V, Steiner M, Marthaler TM. Caries prediction on the basis of past caries including precavity lesions. Caries Res 1991;25:372-376.
5. Acs G, Lodolini G, Kaminshy S, Cisneros GJ. Effect of nursing caries on body weight in pediatric populations. Pediatr Dent 1992;14:302-305.
6. Ismail AI. Prevention of early childhood caries. Comm Dent Oral Epidemiol 1998;26(suppl):49-61.
7. Seow WK, Humphrys D, Tudehope DI. Increased prevalence of developmental dental defects in low-birthweight children: A controlled study. Pediatr Dent 1987;9:221-225.
8. Davies GN. Early childhood caries: A synopsis. Comm Dent Oral Epidemiol 1998;26(suppl):106-116.
9. Seow WK. Biological mechanisms of early childhood caries. Comm Dent Oral Epidemiol 1998;26(suppl): 8-27.
10. Horowitz HS. Research issues in early childhood caries. Comm Dent Oral Epidemiol 1998;26(suppl):67-81.
11. Caufield PW, Cutter GR, Dasanayake AP. Initial acquisition of mutans streptococci by infants: Evidence for a discrete window of infectivity. J Dent Res 1993; 72:37-45.
12. Li Y, Caufield PW. The fidelity of initial acquisition of mutans streptococci by infants from their mothers. J Dent Res 1995;74:681-685.
13. Kohler B, Bratthall D, Krasse B. Preventive measures in mothers influence the establishment of the bacterium of Streptococcus mutans in their infants. Arch Oral Biol 1983;28:225-231.
14. Tinanoff N. Introduction to early childhood caries conference: Initial description and current understanding. Comm Dent Oral Epidemiol 1998;26(suppl): 5-7.
15. Weinstein P. Public health issues in early childhood caries. Comm Dent Oral Epidemiol 1998;26(suppl): 84-90.
16. Randall RC, Vrijhoef MMA, Wilson NHF. Efficacy of preformed metal crowns vs amalgam restorations in primary molars: A systematic review. J Am Dent Assoc 2000;131:337-343.
17. Eidelman E, Faibis S, Peretz B. A comparison of restorations for children with early childhood caries treated under general anesthesia or conscious sedation. Pediatr Dent 2000;22:33-37.
18. Lee JY, Vann WF, Roberts MW. A cost analysis of treating pediatric dental patients using general anesthesia vs conscious sedation. Pediatr Dent 2000;22:27-32.