
Early Childhood Caries and Its Management Strategies - A Review

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Abstract: The aim of the review is to update the current data about Early childhood caries (ECC) and its etiology, prevalence, risk factors, management, and preventive strategies. Dental caries is an international public health challenge, especially amongst young children. Early childhood caries is a serious public health problem in both developing and industrialized countries. ECC can begin early in life, progresses rapidly in those who are at high risk, and often goes untreated. ECC 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. Preventing and controlling the development of ECC among children is important to maintain effective eating, speech development, and formation of a positive self-image.

Keywords: Children; Early childhood caries; Fluoride; Nursing bottle caries; Pediatric dentistry

INTRODUCTION:

The “dental caries” is utilized to represent the outcomes, signs, symptoms, and side effects of a localized chemical disintegration of the tooth surface (enamel and dentin) caused by dental plaque and mediated by saliva (Fejerskov and Kidd, 2009) and by the interaction of bacteria mainly by streptococcus mutans and sugary foods on tooth enamel. *S. mutans* (Anitha and Ashwini, 2017) can spread from mother to baby during infancy and can inoculate even pre-dentate infants. These bacteria break down sugars for energy, causing an acidic environment in the mouth and result in demineralization of the enamel of the teeth and dental caries (Douglass, Douglass and Krol, 2009). Caries is considered a disease with high incidence among childhood chronic conditions, where it is also well-thought-out to cause harm on both population and individual well-being (Chu, Fung and Lo, 1999). When comparing it with other common diseases, dental caries is five times as frequent as asthma and seven times as common as hay fever (Potlia et al., 2016). Early Childhood Caries (ECC) can start right off the bat throughout everyday life, advances quickly in the individuals who are at high hazard, and frequently goes untreated (Grindefjord, Dahllöf and Modéer, 1995) (Slade et al., 2011). In primary teeth, dental caries is a preventable and reversible disease if treated in early stages, but when left untreated it will lead to pain, bacteremia, alteration in growth and development, premature tooth loss, speech disorder, increase in treatment costs, loss of confidence, and negatively affect successor permanent teeth. Dental caries in young children have a pattern; diverse terms and terminology have been utilized to express them (Tinanoff, 1998). Its consequences can affect the immediate and long-term quality of life of the child and family, and can have significant social and economic consequences beyond the immediate family as well (Inglehart, 2002); Dilley and Machen, 1980). Not only children are affected, but also parents will be influenced by this disease being the responsible caregivers (Abanto et al., 2011); (Casamassimo et al., 2009). Dental issues were demonstrated to be the principal explanations behind hospitalization of kids in Australia in 2015 (Chrisopoulos and Harford, 2013). In 1999, a fundamental definition was developed by a workshop sifted through by the National Institute for Dental and Craniofacial Research following the gathering on ECC that was held in 1997 (Guzman-Armstrong et al., 2019)

Also, in 2005 the American Academy of Pediatric Dentistry (AAPD) described ECC as "the proximity of at any rate one decayed (non cavitated or cavitated wounds), missing (considering caries) or filled tooth surfaces in any essential tooth in a kid matured 71 months or younger (Vadiakas, 2008) (Rajeshkumar, Venkat Kumar, et al., 2018). ECC leads not only to temporary pain, but more importantly has major effects on the personal satisfaction of the family/parental figures including money related and wellbeing suggestions (Righolt et al., 2018). In children younger than 3 years of age, any sign of smooth-surface caries is normal for extraordinary

youth caries (S-ECC). From ages 3 through 5, one or more cavitated, missing teeth (due to caries), or filled smooth surfaces in basic maxillary front teeth, or spoiled, missing, or filled score of ≥ 4 (age 3), ≥ 5 (age 4), or ≥ 6 (age 5) surfaces establishes Severe-ECC (Suzuki et al., 2008). Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ezhilarasan, 2018a; Ezhilarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J et al., 2018; Menon et al., 2018; Prabakar et al., 2018; Rajeshkumar, Kumar, et al., 2018; Vishnu Prasad et al., 2018; Wahab et al., 2018; Dua et al., 2019; Duraisamy et al., 2019; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhilarasan, 2019a; Malli Sureshbabu et al., 2019; Mehta et al., 2019; Panchal, Jeevanandan and Subramanian, 2019; Rajendran et al., 2019; Rajeshkumar et al., 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Sharma et al., 2019; Varghese, Ramesh and Veeraiyan, 2019; Gomathi et al., 2020; Samuel, Acharya and Rao, 2020)

Etiology

The etiology of ECC is multifactorial. ECC is as often as possible related to a poor diet (Davies, 1998) and bad oral health habits. As any caries lesion, ECC is realized by poor oral neatness, bacterial invasion, bad diet habits, etc (Karp and Berkowitz, 2008). Also, the presence of enamel defects might contribute to the formation of lesions, such as hypoplasia, known as hypoplasia-associated severe early childhood caries (Wyne, 1998). Monosaccharides can be utilized by numerous individuals of the oral microscopic organisms prompting an expanded creation of acids which can demineralize the enamel (Caufield, Li and Bromage, 2012). More than 700 bacterial species/taxa are known in the oral flora (Meyer and Enax, 2018). These days, it is notable that bacteria (Rajeshkumar, Agarwal, et al., 2018), yet additionally grow, for example, *Candida albicans* can upgrade the movement of caries (Sztajer et al., 2014).

Microbial risk factors

The ECC is a transmittable ailment, *Streptococcus mutans* (SM) and *Streptococcus sobrinus* are the essential cariogenic agents (Bowden, 1990). These acid producing pathogens involving the mouth cause hurt by dissolving tooth structures inside seeing fermentable sugars, for instance sucrose, fructose, and glucose (Schafer and Adair, 2000) (Menon et al., 2018). Most of the investigations (Berkowitz, Turner and Hughes, 1984) have indicated that in youngsters with ECC, *S. mutans* has reliably outperformed 30% of the cultivable plaque vegetation. There are two different ways for transmission: vertical and even transmission (Rajeshkumar, Agarwal, et al., 2018). Vertical transmission is passed on among parental figure and youth i.e., mother or father to child (Caufield, Cutter and Dasanayake, 1993). For level transmission, neonatal parts may extend the chance of picking up SM. Infants delivery by cesarean section transmits SM earlier than through natural delivery (Li et al., 2005).

Dietary Risk Factors

Sugar is set up by both *S. Mutans* and lactobacilli that will in addition change it into destructive, which will cause demineralization of tooth structure. Proof suggests that both bovine and human milk are viewed as less cariogenic than sucrose, with cow's milk being the least (Karthiga, Rajeshkumar and Annadurai, 2018). The association among legitimate eating routine and dental caries has ended up being more vulnerable in contemporary society and this has been credited to the wide usage of fluoride (Ezhilarasan, Evraerts, et al., 2017). Frequent introduction to sweet refreshments and evening time food and beverages advance multiplication of cariogenic bacteria (Bedos et al., 2005).

Ecological risk factors

SM microbes have been gained at an early age, it will for the most part lead to ECC, where different elements may add to caries movement or prevention (Ezhilarasan, 2018b), budgetary status of parental figures, water fluoridation, race, number of significant lots of guidance, and dental security coverage (Kidd, 2005).

Children with a background of dental caries, whose parents and siblings have serious dental caries, are viewed as being at high risk of having dental caries in their future (Baskran and Pradeep, 2016). Absence of access to dental thought, inadequate accessibility of preventive measures, for example, water fluoridation, fluoride supplementation, and dental sealants, and the nonappearance of information of the importance of oral neatness are contributing segments to an oral tidiness decrease in little children.

Determination

ECC is from the start seen as a dull, white hand of de-mineralized clean that quickly advances to clear decay along the gingival margin (Packiri, 2017). S-ECC was obtained in lieu of uncontrolled caries inside seeing in any occasion one of the going with measures. Any indication of caries on a smooth surface in kids more prominent below 3 years (Mehta et al., 2019). Any smooth surface of an anterior-posterior deciduous tooth that is decayed, missing (due to caries), or filled in children between 3 and 5 years old. The DMFT record is

equivalent to or more prominent than 4 at 3 years old years, 5 at 4 years old years, and 6 at 5 years old years (Verma, Bansal and Singhal, 2013).

Management

Causative factors must be identified. Treatment of ECC sometimes consists of restoration using micro restorative techniques and adhesive materials or by surgical removal of carious teeth (Gheena and Ezhilarasan, 2019b). In any case, it is settled that dull caries around remaking endeavors is ordinary, however the descent into sin after cautious ejection of caries tooth is generally 40% after the first year (Karp and Berkowitz, 2008).

Anticipation of Maternal Bacterial Transmission to the Child :

This technique is utilized as a methodology in preventing cancer-causing nature of feeding. The inclination for dealing with little children around night time using nursing bottles or sippy cups will fabricate the peril of finish demineralization. Newborn children whose moms have raised proportions of SM because of untreated dental caries are at more risk of moving these living creatures to the child (Milgram, 1998).

Oral Health education

Dental caries can't happen without the substrate segment of sugar (Ravikumar, Jeevanandan and Subramanian, 2017). In this way, a significant part of the expert guidance and useful research has concentrated on change of the baby diet and taking care of propensities through training of the parents (Sharma et al., 2019). Some regular plants shield from the disease (Ashwini, Ezhilarasan and Anitha, 2017) (Lakshmi et al., 2015). Some concentrates will present apoptosis in oral cells (Ezhilarasan, Lakshmi, Vijayaragavan, et al., 2017) (Perumalsamy et al., 2018) (Ezhilarasan, Lakshmi, Nagaich, et al., 2017). Oral prosperity guidance is an organized heap of information, learning activities, or experiences that are relied upon to convey improved oral prosperity with the basic goal of ailment balance.

Fluoride

The use of fluorides in dentistry began inside the nineteenth century. Fluoride is found in water all together that all individuals ingest some fluoride day by day. Fluoride in water likewise will decide the quality of the teeth. The fluoride varnish type contains high centralization of topical fluoride (Somasundaram, 2015), the method of activity is by expanding the convergence of fluoride on the applied surface of the tooth. This builds fluoride take-up during beginning periods of tooth demineralization (Wright et al., 2014). Fluoride things, for instance, mouth wash, dental opening topical fluoride, and toothpaste have seemed to reduce caries some place in the scope of 70% and 30% of separated and no fluoride treatment respectively (Jenkins, 1985). The AAPD has given certain suggestions that should be followed while recommending fluoride toothpaste or fluoride enhancements to patients in order to diminish the chance of fluoride harming.

Policy statement

Avoid frequent consumption of liquid and solid foods which contain high sugar levels especially during night time (Weyant et al., 2013). Avoid underage fluoridated toothpaste. Follow guidance in prevention of oral diseases. Our institution is passionate about high quality evidence based research and has excelled in various fields ((Pc, Marimuthu and Devadoss, 2018; Ramesh et al., 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai et al., 2019; Sridharan et al., 2019; Vijayashree Priyadharsini, 2019; Mathew et al., 2020)

CONCLUSION:

In addition to a low sugar diet, children should brush their teeth twice a day under parental supervision and be supported with brushing. The caregivers should especially support very young children (under the age of 3) continuously. Toothpastes should mainly comprise promising remineralizing agents for children's oral care such as calcium phosphates. Moreover, dental specialists need to build up the most ideal approaches to offer preventive and clinically successful care. Dentists must focus on to give guidance to counteract and control caries in patients.

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