A literature review on early childhood caries

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Abstract

The most common problem in the era of childhood is dental caries. Dental caries is not a self-limiting disease, and continue to progress until it destroys the whole tooth structure or otherwise be stopped by using some chemical or mechanical measures. When proper measures are used dental caries can be arrested and the condition can be returned back to the normal early stage. The primary cause of early childhood caries is inappropriate feeding practice and might be due to infection caused by streptococcus mutans.

Keywords: Streptococcus mutans, Caries, Early childhood caries, Inappropriate feeding practice.

Introduction

Dental caries can be defined as the chemical dissolution of the surface of the tooth i.e. localized only that occurs due to the metabolic events that is occurring in the plaque or the biofilm that is covering the outer most surface of the tooth.^[1] early childhood caries have a special type of pattern that affects the children age ranges between 1 year to 2.5 years of age and that too differs from the pattern of caries in the older age group of children. These children that got affected by early childhood caries should be treated with special preventive program that contains proper instructions of oral health care given to the parents, along with proper diet chart to the child. In early childhood caries, the maxillary anteriors are most commonly and mandibular anterior teeth are least commonly affected, as they are protected by the tongue and the saliva from the submandibular and the sublingual salivary gland in the mouth. Early childhood caries has also been known as nursing bottle caries, nursing caries, night bottle mouth. So all this denote that the primary cause of early childhood caries is due to inappropriate bottle feeding, other etiological factors for early childhood caries could be the use of liquid containing sugar during the night time also help in progression of the disease in the child. So literature said that any form of caries that affects the infants and the pre school going children can be described as early childhood caries.^[2,3]

Early childhood caries begins as a white spot lesion in the maxillary anterior teeth at gingival margin. If at this point the disease is not stopped can progress in the completely destruction of the entire tooth structure. There is much more probability of caries affecting the primary as well as the secondary dentition of the individual who once affected by the early childhood caries during the infancy period.^[4-7] Literature revealed some other serious issue associated with the general health of the individual as, the one who is suffering from early childhood caries also presented with slower rate of growth as compared to the one who is not

suffering from early childhood caries, some of the children diagnosed as under weight due to the presence of pain by early childhood caries and their reduced interest to eat the food can lead the child as to the condition of under weight, literature revealed that early childhood caries is also associated with deficiency of iron.^[8,9] Any of the individual can be remained susceptible to the disease of caries throughout the entire life, dental caries can be stopped with proper care and measure if taken and can revert back to the normal tooth condition.

The prevalence of early childhood caries is different from population to population. A study revealed that irrespective of the population or the race or the culture, the children or the infant that belongs to socioeconomic weaker section are more prone to be affected by the early childhood caries. Literature revealed that in the countries that are developing nations the prevalence of early childhood caries is more towards the children on economically weaker section as compared to the other children of higher section ^[11]. Literature revealed that the prevalence of early childhood caries in the western countries in the children of age group of three years was found to be 19.9 percent with strong correlation with the socioeconomic status.^[12]

Pathogenesis of early childhood caries

The primary cause of pathogenesis of early childhood caries is the presence of carbohydrates that are fermentable i.e. sucrose, galactose, fructose in the oral cavity along with the presence of dental plaque or the bio film on the tooth surface. Hydrogen ions that are liberated from the acidogenic microorganisms results in the breakdown of the hydroxyapatite carbonated crystals lattice of the enamel and the cementum. And if this process of breakdown continues, demineralization of the tooth structure proceed and will result in cavity formation at the enamel tooth surface. The caries process is very much high in the dentinal surface, once the

demineralization comes over the enamel surface and reaches the dentinal surface, the process caries progression is much faster in dentinal surface and the one often required a restorative procedure for the same. The process of demineralization as well as remineralization continues in the oral cavity through out the day. And when fluoride is present in the saliva, it is absorbed automatically over the demineralized surface of the tooth and prevent the acid dissolution of the surface of the tooth.

Etiological factors for early childhood caries

Early childhood caries are most commonly caused by microorganisms, *Streptococcus mutans* and *Streptococcus sobrinus*. These are the microorganisms that initiate the process of caries in the oral cavity. Other microorganisms like *Lactobacillus* helps in the progression of the disease rather than the initiation of the disease. *Streptococcus mutans* play as primary factor in the initiation of the disease. Mothers acts as reservoir of *Streptococcus mutans* and can vertically transmit the microorganism to the infant. Mothers that are having dense reservoir of *Streptococcus mutans* are found to be more vulnerable to transmit the infection to the child at the early age. Literature revealed that, mothers that are having poor oral hygiene and do have high frequency of sugar or snacks intake are more prone to affect the child.^[14-16]

Children that are more exposed to sugared beverages or sugared milk in excess are more prone to acquired early childhood caries, the use of nursing bottles also increased the exposure to the *Lactobacillus* and progression of the disease. Literature revealed that cow milk is found to be non cariogenic because of the content of the minerals present in it along with low level of lactose in it. Literature revealed that breast feeding to the child in the night time that too for more than one hour increases the chances of early childhood caries in the children. Another study stated that, human milk was found to be high cariogenic when compared to the cow milk.^[17-20]

Some of the environmental risk factors that contribute to the early childhood caries are as socio economic status, education, diet i.e. whether the child has been given cariogenic or the non cariogenic diet. Some of the children with the history of dental caries or their siblings had a history of dental caries are more prone to develop the disease when compared to the child who don't have any history of caries.

Different treatment modalities

Initial treatment modality includes the parent education regarding the hygiene measures of the child, proper diet counseling to the parents regarding the diet of the children, avoid adding sugar substitutes in the child diet, avoid giving cariogenic diet to the child, will initially help in reducing the probability or incidence of caries in the child mouth. After the initial step, restorative phase should be started to remove the carious part of the tooth and proper restoration should be done, grossly decayed tooth or teeth should need to be extracted to maintain the oral health of the child.

One should avoid cariogenic feeding to the child by avoiding sugar filled bevarages in the nursing bottle that may enhances the frequency of demineralization of the enamel. This type of feeding pattern especially in the night may lead to more chances of dental caries, as during the night the salivary flow rate is quite less. A recently described therapy known as topical antibiotic therapy helps in reducing the caries rate in the child mouth in this therapy they utilizes 10 percent povidine iodine solution and applied this solution over the tooth surface topically every two months duration for an year and found that, there is reduction in caries in the infant mouth.^[22]

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Conflict of Interest

None.

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