

Why are Some Children More Susceptible to Dental Caries?

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Received: June 18, 2019; **Published:** August 27, 2019

Abstract

Tooth decay is a major health problem in industrialized countries and is a growing threat in developing countries. Many people do not recognize that oral hygiene can improve longevity and improve the quality of their lives. Teeth Loss usually causes malnutrition in both children and adults, and subsequently leads to another set of other health problems; unfortunately, the global health weakness can have a serious impact on general health and quality of life of the individual.

The major perception of people is that tooth decay is a problem which the advanced countries have solved, while 60 to 90 percent of students and the majority of adults suffer from it. Meanwhile, the World Health Organization says that increasing consumption of sweets and deficiencies in use of fluoride supplements such as mouthwashes and toothpaste contained with fluoride, oral hygiene is coming to an end soon; the world will observe the children's oral health become worse than before.

In some cases, although oral hygiene is good, the weakness in teeth structure (Amelogenesis Imperfecta) of the child promotes dental decays.

Keywords: *Tooth Decay; Advanced Countries; Consumption of Too Much Sweets, Fluoride Supplements; Amelogenesis Imperfecta*

Introduction

Although many parents are particularly concerned about the oral health of their children, the incidence of dental caries among children is still high. One of the most important contributing factors in the prevalence of dental caries is unusual using of various beverages, industrial juices, and sweet drinks [1,2]. Unfortunately, some factories add ingredients to their products that increase the risk of dental decays further.

It should be noted that bacteria are present in the mouth of all children; hence they are prone to dental caries. Of course, factors such as high levels of bacteria [3-6], excessive consumption of starchy ingredients [7-9], the lack of fluoride [9], poor oral health [9] and the insufficient flow of saliva [11] will increase the risk of damage to teeth in children. Tooth decay occurs when the bacteria in the mouth break down the sugar molecules and dissolve the teeth with acid production [12-14]. Dental decays do not involve all the surfaces; however, some teeth are more likely prone to caries due to their specific condition (Genetics condition such as Amelogenesis Imperfecta). Despite the efforts of parents, the teeth of some children are intrinsically weak and easily decayed.

Main factors

Some children are more likely to be exposed to caries than other children, which can have different reasons. Although the occurrence of dental caries in children can have different causes, the most important factors are briefly explained in the following. These contributing factors clearly explain why some children are more prone to dental caries compare to other peers.

Sucking the milk bottle and consuming sugary drinks while sleeping

Very young children's dental caries are usually due to drinking milk with a bottle while sleeping or during the night, and is seen in most children under the age of four [15]. Lactose in milk or sugar added to the milk or juice will smear the teeth and stays on the teeth all night. Consequently, the contact of the sugar substances with the tooth will be high during the night and on the other hand, the flow of saliva during the night will be low, hence, the oral bacteria are easily able to convert sugar substances into organic acids which have detrimental effects on enamel; leads in teeth decay [12-14].

Furthermore, in breastfeeding children, if the mother after the first year of childbirth gives him milk overnight, it can damage the child's teeth [16-19]. Sugar content first harms the primary anterior teeth, but if this continues, all teeth will be damaged and decayed.

Consumption of sugar and sweets in older children

Eating sugar some times (especially chocolates, candies and chewing gums, or drinking sweet liquids) between meals, forcing the bacteria to produce acid from sugars which leads to tooth decay. Eating sugary substances with foods will lessen the risks of damage to the teeth because food and saliva neutralize the produced acids in the mouth [7,9,17,20]. Sometimes, the baby's pacifier is sweetened with honey or sugar to calm the baby down, which in this case, the risks of dental caries will be greater in children.

Non-observance of oral hygiene

Not tooth brushing after each meal will cause small particles of food to remain between the teeth and as a result, oral bacteria grow and proliferate in the remaining food. Hence, negligence in oral hygiene and keeping the residues of foods, promote the growth and replication of microbes and increasing the number of bacteria in the mouth, and ultimately develops the number of dental and oral diseases [9,21].

Insufficient fluoride in water

Fluoride is a soluble solution that with the other solutions increases the strength of other teeth and prevents the damage to them [9,22-24]. Fluoride is delivered to children through drinking water and also by foods.

Sickness

The saliva has an antimicrobial effect itself [25-30]. When the child develops a weakening disease, the amount and effects of antimicrobial activity of the saliva is reduced [31,32], so the lack of oral hygiene, especially during illness, is effective in accelerating the teeth damage.

Congenital dental disorder

Some genetic disorders that affect enamel and dentin in children can provide a foreground for the development of dental caries, which explanation and listing all of them in this article, will be very challenging. For this reason, we only consider the one below (Amelogenesis Imperfecta & HSPM) that is significant for us.

Amelogenesis Imperfecta and HSPM

It was previously thought that only a very small minority (0.1%) of people who have Amelogenesis imperfecta [33], are susceptible to early decay, but recent studies by Australian researchers have shown that 14% of preschoolers may have hypomineralized second primary molars (HSPMs) [34-36]; in this case, the enamel (outer layer) of the second molar molars is not properly grown, weakened and susceptible to damage.

These hypomineralized teeth may have white or yellow spots with coarse areas in which the areas of impaired enamel are lost [37-41]. These teeth can be so weak that they do not meet the child's requirements for food chewing and even break shortly after the eruption [41].

These teeth are often very sensitive, and children may avoid tooth brushing because of pain and discomfort [42,43]. Such sensitivity with a poor enamel means occurrence of dental caries is easier.

Providing dental care to these children is challenging because the usual local anesthetic is less effective for them [44] and most teeth are damaged during treatment. The usual restorative dental materials such as composites that bond with enamel, because of the poor quality of the enamel are not bonding on the teeth for a long time and are separated from the teeth, which is why the referral of these children for dental treatment is greater.

Research has shown that all of these failures could lead to an increase in the level of anxiety, and fear of dentistry in the child [45]. The bad news does not end there, if the teeth are affected by this problem, it is more likely that the permanent teeth are prone to decay and breakage.

Causes

The tooth enamel forms long before the teeth eruption happens. The formation of the child's primary molars begins between the sixth and eighth week of pregnancy [46] and their growth is essentially complete until birth. Unlike skin and bone, enamel cannot be restored naturally, so when the second primary molar appears in the mouth about the age of 2, any defect that occurs during the tooth formation remains in the molar's teeth.

Despite the advice given to parents for dental examinations of children up to the age of two, only one child in each of the three children until the age of four is examined by the dentist. Sometimes parents will not notice defected teeth until the teeth are broken or infected. In such cases, it may be necessary to extract the teeth.

A recent study on twin children showed that the causes of this issue may not be genetic, but because of something that occurs during the pregnancy or at birth. Research has shown that hypomineralization of second primary molars is associated with maternal illness, smoking, and alcohol consumption during pregnancy [47] and research is ongoing to clarify these relationships.

Treatments

Conditions that weaken the tooth enamel it means although a healthy diet and good brushing are good for having healthy teeth, the more cautions are needed for these children. Before the teeth would be broken, the dentists are able to detect the weak teeth. The treatment modalities can be different regarding the types of Amelogenesis imperfecta and the causes. In the patients with hypoplastic AI, enamel has enough strength to bond to composite, hence, the application of composite restoration may be the successful approach to remove discoloration and improve the teeth esthetics [48].

In patients with hypocalcified AI, the insufficient enamel bonding is reported in some studies. Glass ionomer types of cement and composite resin restorations might have good prognosis at the beginning of the treatment, but in the long term, the failure has reported as fractures in the restoration leading marginally broken areas [48]. Full coverage with SS crowns is recommended for hypocalcified AI [49,50].

The dentist can provide artificial replacements for unhealthy enamels. They can use fissure sealants or fillers to protect those poor teeth and cover weak areas with these materials to prevent them from breaking or to have caries. In additions, SS crowns can eliminate the sensitivity of the tooth [50].

In the affected teeth, the time for additional protection is short, so it is important that dental examinations be performed regularly from the beginning of the 12th month or when the first teeth appear in the mouth.

Conclusion

Oral problems are one of the most common problems of people around the world nowadays. Of course, with the advancement of health status, the rate of dental caries and teeth loss is lower than in the past, but according to the type of nutrition, misconceptions and the inadequate use of oral hygiene, unfortunately, dental problems still is one of the catastrophes among children.

Dental caries of children may be mostly due to drinking milk from a bottle during sleep (all night), excessive consumption of sugars and sweets, non-compliance with oral and dental hygiene, and sometimes diseases.

Dental caries can have a genetic etiology. In our article, Amelogenesis imperfecta is the case which is usually applied as a developmental defect with a genetic etiology that affects the enamel of both primary and permanent dentition. Affected teeth have abnormal color, and are more susceptible to dental caries, attrition and so on. Therefore, these contributing factors can explain why some children are prone to teeth decays.

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Volume 8 Issue 9 September 2019

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