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Breastfeeding: A pediatric Dentistry Approach

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Abstract

Introduction: Exclusive breastfeeding has multiple short- and long-term benefits. Poor oral hygiene, poor nutrition and poor eating habits are risk factors for early childhood caries (ECC).

Objective: To analyze the literature on the systemic and oral benefits of breastfeeding (BF), as well as the effects of prolonged and nightly breastfeeding.

Methodology: A literature review was carried out in PubMed and Google Scholar databases using the keywords: early childhood caries, breastfeeding, breastmilk, bottle feeding, prolonged breastfeeding, diet, sugar, pediatric dentistry, oral hygiene, and Boolean parameters AND, OR and NOT.

Results: BF reduces the risk of developing acute and chronic diseases. It is the best practice to ensure proper growth of the craniofacial complex with optimal breathing, feeding and sleeping functions. Prolonged BF is not a risk factor for ECC. Breast milk protects against ECC.

Conclusions: The evidence shows that ECC is related to the presence of sugar in the diet and not to breastfeeding. Breast milk is a protective factor against ECC, but good oral hygiene and a diet reduced in sugars are recommended.

Keywords: Early childhood caries, breastfeeding, breastmilk, bottle feeding, prolonged breastfeeding, diet, sugar, pediatric dentistry, oral hygiene.

1. Introduction

Caries is a sugar-dependent disease that causes demineralization of enamel, which is caused by the increasing acidity of the microenvironment produced by a selective group of bacteria ^[1]. The American Academy of Pediatric Dentistry defines early childhood caries (ECC) when a child under 71 months of age has one or more decayed (with or without cavitation lesions), absent (due to caries) or filled (dmfs) tooth surfaces on any primary tooth ^[2]. In developed countries, its prevalence is between 1% and 12%, but can reach 70% in high-risk populations, such as low socioeconomic groups or ethnic minorities ^[3]. Of the various risk factors associated with ECC, the most vital is bottle feeding at bedtime, rapid breastfeeding and repeated intake of snacks and sugary drinks ^[4]. Likewise, poor oral hygiene, poor nutrition and eating habits ^[5]. The association between bedtime feeding practices and ECC remains unclear ^[6]. Breast milk best influences infant survival ^[7]. Exclusive breastfeeding remains the cornerstone of infant nutrition during the first six months of life, as it has multiple short- and long-term benefits ^[8]. The WHO recommendation is to breastfeed the infant for the first six months exclusively, and then introduce complementary foods with continued BF until 24 months or beyond ^[9]. Breast milk plays an important role in providing nutrients, beneficial microorganisms and bioactive components to infants, contributing to the maturation of their immune system and gastrointestinal development ^[10]. Longer duration of BF protects against many infectious diseases ^[11], has the potential to improve neonatal and maternal health ^[12]. Unlike artificial milk, breast milk contains casein, which prevents the growth and adhesion of cariogenic bacteria, especially streptococci, to the enamel ^[13]. In pediatric dentistry it is common to see infants presenting with ECC. There is controversy as to what constitutes the best form of infant feeding for preventing dental caries and promoting optimal dental health.

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Therefore, the aim of this study was to review the oral and situational advantages of BF as well as to analyze the relationship between prolonged and nocturnal breastfeeding and dental caries.

2. Materials and Methods

Articles on the subject published through the PubMed, Scopus and Google Scholar databases were analyzed, with emphasis on the last 5 years. The quality of the articles was evaluated using PRISMA guidelines [14], i.e., identification, review, choice and inclusion. The quality of the reviews was assessed using the measurement tool for evaluating systematic reviews (AMSTAR-2). The search was performed using Boolean logical operators AND, OR and NOT. It was realized with the words “early childhood caries”, “breastfeeding”, “breastmilk”, “bottle feeding”, “prolonged breastfeeding”, “diet”, “sugar”, “pediatric dentistry”, “oral hygiene”. The keywords were used individually, as well as each of them related to each other.

3. Results and Discussion

3.1- Systemic benefits of breastfeeding

Epidemiological studies show that breast milk and breastfeeding improve overall health, provide nutrition, psychological, social and economic development, and environmental benefits. During the first years of life, children can be kept safe from deadly pathogens simply by adequate breastfeeding [15]. Breast milk also significantly reduces the risk of developing acute and chronic diseases [16]. Breastfeeding was associated with a lower risk of obesity [17]. Breastfeeding protects against chronic noncommunicable diseases such as diabetes mellitus and cardiovascular disease. It also influences high-density lipoprotein and cholesterol levels in adults. It can also reduce blood pressure by affecting systolic and diastolic blood pressure [18]. Immunological compounds in breast milk reduce gastrointestinal tract infections, respiratory tract infections, hospital admissions, acute otitis media, allergic reactions and urinary tract infections [19]. The content of immunoglobulin A and lactoferrin secretion in breast milk and immunization can enhance the body's immune system in young children with acute respiratory infection [20]. Breastfeeding was found to protect against asthma between the ages of five and eighteen years, eczema until the age of two years and allergic rhinitis until the age of five years [21]. It has also been observed that breastfeeding reduces the risk of non-alcoholic fatty liver disease [22] as well as preventing Kawasaki disease and several autoimmune disorders [23]. Regarding breastfeeding and the COVID-19 vaccine, anti-SARS-CoV-2 S1 IgA was observed in 89% of breast milk from vaccinated women; anti-SARS-CoV-2 S1 IgM was not detected. A positive correlation was observed between anti-SARS-CoV-2 RBD-S1 IgG in serum and breast milk. This association was greater if breastfeeding had been < 24 months versus \geq 24 months. Compared with breastfeeding < 24 months, breastfeeding > 24 months was associated with higher levels of breast milk anti-SARS-CoV-2 RBD-S1 [24]. Breastfeeding has multiple systemic and protective benefits, provides adequate nutrition to the infant preventing chronic diseases such as diabetes and obesity, and has a good psychological and social impact. It contains immunological compounds that reduce gastrointestinal tract infections, respiratory tract infections and allergic reactions. It is safe to get the COVID-19 vaccine if you are breastfeeding, the protection to the infant is not yet well defined.

3.2. Influence of breastfeeding on oral health

The method of feeding is closely related to dentition and jaw development. Breastfeeding and bottle feeding involve the use of different orofacial muscles, which possibly have different effects on the harmonious growth of the maxilla and dental arches. Meanwhile, breathing, swallowing and chewing should develop in harmony, and there are differences in learning coordinated movement between breast-fed and bottle-fed infants [25]. Breastfeeding is the best practice to ensure adequate nutrition, proper growth of the craniofacial complex, and overall health of the infant, with optimal breathing, feeding, and sleeping functions [26]. Breastfeeding is an early prevention of Functional Orthopedics of the Jaws because the forces of breastfeeding impact the jaws during a very rapid period of infant jaw growth. Breastfeeding contributes to the proper development of the jaws, which are the gateway to the human airway [27]. Pure breastfeeding for more than 6 months is positively associated with primary dental arch development in the anterior sagittal dental segment and on horizontal arch width in primary dentition. Therefore, pure breastfeeding for more than 6 months is recommended as it is associated with a lower probability of development of abnormal dental relationships [28]. Non-breastfed children presented significantly higher probabilities of having anterior open bite compared to those who were breastfed for periods longer than 12 months, demonstrating the beneficial influence of breastfeeding on dental occlusion [29]. As there is a statistically significant relationship between variables such as feeding form in the postnatal period and malocclusion-normal occlusion, Angle class and overjet [30]. Dentists should be aware that premature birth may be a risk factor for malocclusion in the primary dentition. The findings reinforce the benefits of breastfeeding on occlusal development and the negative consequences of pacifier use [31]. There is no evidence that human milk is cariogenic; other factors, such as oral hygiene, may influence caries development more than breastfeeding on demand [32]. Breastfeeding benefits the development of the orofacial structures allowing their adequate development, which is related to a lower probability of anomalies in dental harmony. Bottle-fed children have a higher risk of developing anterior open bite while breast-fed children do not. Breast milk is protective against ECC.

3.3- Prolonged breastfeeding and ECC

Seventy-five percent of children who were breastfed beyond the age of 2 years suffered from ECC [33]. Prolonged breastfeeding was not a risk factor for ECC, whereas age, high sucrose composition between main meals and quality of oral hygiene were associated with disease in children [34]. There was no relationship between breastfeeding and early childhood caries, and duration of breastfeeding was not associated with increased caries risk [35]. The effect of prolonged breastfeeding on increased risk of dental caries is mediated by sugar consumption [36]. Breastfeeding for 12 months or more has a positive correlation with ECC. These results showed that the odds of acquiring ECC were higher when the child was breastfed for more than 12 months. Possible reasons for these findings could be the presence of enamel defects, harmful habits such as bedtime feeding, consumption of cariogenic complementary foods, saliva pH and oral hygiene practices [37]. There is a statistically significant direct association between BF for more than 12 months and the risk of caries. However, BF up to 12 months is a protective factor [38]. Statistically significant associations

were also found between ECC and: breastfeeding after 18 months; intake of sugary foods and beverages by the child ($p < 0.05$); maternal caries experience; illiteracy; nighttime breastfeeding, bottle feeding and late introduction of toothbrushing by the child [39]. Infants who attended oral consultation and examination at around 12 months of age were less likely to develop dental caries at 18 months than those who did not. Infants in whom a regular oral care program is implemented starting at 12 months of age are less likely to develop early childhood caries at 18 months or 3 years [40]. Children who were breastfed for ≥ 24 months had a higher number of dmfs than those who were breastfed until 12 months of age. Breastfeeding between 13 and 23 months had no effect on dental caries [41]. Prolonged breastfeeding is not a risk factor for ECC, a diet high in sugars as well as the early introduction of sugars to the diet is. It is important to emphasize the importance of brushing teeth at least twice a day with fluoride toothpaste to prevent the risk of ECC.

3.4 Breastfeeding at night and ECC

ECC was associated with nighttime breastfeeding and biological factors [42]. Most women reported keeping their infant in bed with them for most, if not all, of the night. All mothers reported breastfeeding on demand. Approximately half of the mothers did not disclose their sleep patterns to the physician. Mothers reported that few health care professionals initiated a conversation about co-sleeping or oral hygiene with their infants [43]. ECC was more prevalent among children who were nightly breastfed ≥ 12 months, those who had not previously seen a dentist, those who used sugary pacifiers, and those who consumed sugary drinks/snacks daily [44]. A 2- to 3-fold increased risk of dental caries was recorded if breastfeeding is frequent and/or nocturnal after 12 months¹. In children who breastfeed at night, breastfeeding after 18 months of age is considered a risk factor for oral caries because infants breastfeed frequently without waking their mother. Thus, the mother cannot perform oral cleaning after feedings, which allows the development of carious lesions [45]. Associations were found between ECC and breastfeeding after 18 months, intake of sugary foods and drinks by the child, maternal caries experience, illiteracy, nighttime breastfeeding, bottle feeding and late introduction of toothbrushing by the child [39]. Prolonged breastfeeding for more than 1 year and nighttime breastfeeding were not associated with dental caries [46]. There was no independent association between breastfeeding after 1 year of age and ECC, or between breastfeeding to sleep and ECC, although the direction of effect suggested an association. The only factors independently associated with ECC were high intake of free sugars and greater socioeconomic disadvantage [47]. Type of dairy feeding was not associated with dental caries, while dental plaque and sleeping while feeding milk increased the odds of having dental caries in this population. Breastfeeding on demand is a healthy habit for both mother and baby, if it is administered at night in children who have not had contact with sugary foods it is not necessary to brush teeth after night feedings on demand because it has protective factors against ECC. The cause of ECC is sugar, therefore BF is given until the mother and baby need it.

4. Conclusions

There has long been controversy regarding breastfeeding and early childhood caries. Breastfeeding provides nutrition to the infant as well as prevents obesity and multiple chronic diseases such as diabetes mellitus and cardiovascular diseases.

Immunological compounds in breast milk reduce gastrointestinal tract infections, respiratory tract infections and allergic reactions. Breastfeeding is an early prevention of functional orthopedics of the jaws because the forces of breastfeeding impact the jaws during a very rapid period of infant jaw growth. Beyond 1 year, it is difficult to conclude between caries protection and caries aggravation due to the multiplicity of confounding factors, such as dietary patterns, which vary according to countries and families, and oral hygiene problems. However, evidence shows that ECC is related to the presence of sugar in the diet and not to breastfeeding, and breast milk is a protective factor against ECC, although good oral hygiene and a sugar-reduced diet are recommended.

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