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DOJENJE IZ UGLA DEČJEG STOMATOLOGA

BREASTFEEDING – THE PERSPECTIVE OF PAEDIATRIC DENTIST

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SAŽETAK

Savremene preporuke Evropske i Američke akademije dečjih stomatologa i Međunarodnog udruženja dečjih stomatologa savetuju postepeni prekid dojenja nakon nicanja mlečnih zuba kako bi se smanjio rizik od nastanka karijesa ranog detinjstva (KRD). Sa druge strane, preporuke Svetske zdravstvene organizacije, preporuke Američke akademije pedijatara i stručnjaka iz oblasti ishrane prepoznaju brojne kratkoročne i dugoročne pozitivne efekte dojenja i podržavaju isključivo dojenje do uzrasta od šest meseci, a zatim postepeno uvođenje čvrste hrane sa nastavkom dojenja uz neograničeno i dojenje na zahtev do druge godine deteta i duže. Cilj ovog preglednog rada je bio da se analiziraju savremeni podaci u literaturi o uticaju dojenja na nastanak KRD, kako bi se doprinelo formiranju jedinstvenog stava i pružila jasna informacija majkama kako prevenirati KRD. Na osnovu pretraživanja Pub Med baze podataka, uočava se da postoji povezanost između dojenja i KRD, ali nije dovoljno argumentovano koje su najbolje mere u prevenciji karijesa. Imajući u vidu poznate pozitivne efekte dojenja, smatra se da je preporučljivo pratiti savremene pedijatrijske preporuke koje savetuju neograničeno dojenje koliko god to uzajamno prija majci i detetu. Ipak, potrebno je imati u vidu neophodnost ranih preventivnih poseta dečjem stomatologu i edukacije zdravstvenih radnika radi adekvatnih i blagovremenih saveta o higijeni usne u duplje i ishrani kako bi se izbegao nastanak karijesa ranog detinjstva i omogućilo blagovremeno dijagnostikovnje inicijalnih lezija. Neophodna su dalja istraživanja u ovoj

SUMMARY

Current recommendations by the European Academy of Paediatric Dentistry, American Academy of Paediatric Dentistry, and International Association of Paediatric Dentistry advocate weaning from breast milk and avoiding unrestricted breastfeeding after the eruption of primary teeth in order to lower the risk of early childhood caries (ECC). However, World Health Organization, American Academy of Paediatrics and nutritional recommendations support exclusive breastfeeding up to six months of age, following continued breastfeeding along with appropriate complementary foods, favouring unrestricted and prolonged breastfeeding even beyond the age of two. The purpose of this review is to discuss current data in the literature regarding the association between breastfeeding and ECC in order to address this problem and to provide consistent recommendations. PubMed search revealed possible link between breastfeeding and ECC, however without evidence strong enough to establish the appropriate oral health preventive recommendation. Having in mind known benefits of breastfeeding, it is advisable to adhere to current paediatric guidelines which promote unrestricted breastfeeding as long as it is mutually desired by mother and child. This recommendation doesn't exclude but complements the prevention and timely treatment of ECC. Furthermore, there is a need to highlight the importance of education of parents and health care providers about the ECC risk factors, identification of initial lesions and consequences. Further research regarding this issue is

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oblasti.
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needed.
Keywords: breastfeeding, dental caries, infant.

Introduction

Breastfeeding brings numerous benefits to both mothers and children, but it has social and economic effects on families and societies, too (1). Breastfeeding positively affects mothers' health improving healing of childbirth trauma and lowering the risk of obesity, osteoporosis, breast and ovarian cancer, etc. (2). Furthermore, breastfeeding improves infant's emotional and psychological development, wellbeing, and general health (decreasing the risk of acute and chronic diseases such as asthma, pneumonia, bronchiolitis, acute otitis media, allergies, diarrhoea, gastroenteritis, diabetes mellitus, leukaemia, atopic dermatitis and sudden infant death syndrome) (3). In addition, evidences from the research indicate that breastfed babies are less likely to become obese in adulthood (4).

World Health Organization, American Academy of Paediatrics and nutritional recommendations regarding breastfeeding are clear – starting breastfeeding within the first hour of life, supporting exclusive breastfeeding up to six months of age, followed by continued breastfeeding along with appropriate complementary foods, favouring unrestricted and prolonged breastfeeding even beyond the age of two (5-7).

However, paediatric dental recommendations suggest that prolonged, unrestricted, and frequent breastfeeding (more than 7 times a day) after the first birthday, especially night feedings, affect oral health and favour the development of early childhood caries (ECC) (8-12). Some studies also identified sleeping with the nipple in the mouth as a risk factor for ECC (13). Accordingly, gradual weaning and avoiding unrestricted breastfeeding after the eruption of the first primary teeth by 12th to 14th month of age is recommended (9).

ECC represents one of the most common diseases in paediatric population (14,15) leading to reduced quality of life due to pain, impaired eating, social skills, loss of sleep, causing distress, altered behaviour and disturbances in child's nutritional status and development (16). Likewise, ECC might cause repeated prescription of antibiotics, emergency room visits and even hospitalization (17).

Globally present and traditionally opposing opinions between paediatricians and paediatric dentists result in confusion, since nursing mothers are unable to get clear and straightforward guidelines (18). Therefore, there is a strong need to clarify the association between breastfeeding practices and the occurrence of ECC. The aim of this review was to analyze the results from currently available studies discussing breastfeeding effect on oral health.

Methods

A PubMed search using combinations of keywords related to infant breastfeeding pattern (breastfeeding, nursing, feeding, children, infant) and early childhood caries (early childhood caries, nursing caries, rampant caries, baby bottle caries, decay, etc.) was performed based on studies published in English before September 2019. All articles with available full text were analyzed; studies investigating the association of breastfeeding and ECC were selected and divided in two large groups based on positive or negative association between breastfeeding and ECC. Furthermore, articles were analyzed according to their study methodology.

Evidence suggesting a link between ECC and breastfeeding

Cariogenic potential of human breast milk was proposed when investigators observed higher levels of carbohydrates and lower levels of calcium, phosphorus and proteins compared to bovine milk (19-22). Incubation of human milk with saliva caused significant drop in pH level (from 6.44 to 4.57), suggesting possible occurrence of demineralization if contact with enamel lasted for 8 hours per night during 6-day immersions (23).

Epidemiological cross-sectional studies reported higher occurrence of caries in breastfed children and the necessity to educate parents to stop breastfeeding after 12th to 18th month (24-28). Positive association between breastfeeding and caries was confirmed by observation of infants who were breastfed for more than 13 months (29), more than 18 months (30-32) and more than 24 months (33). Furthermore, follow up of a cohort who was still breastfed at 18th and at 24th month of age showed higher frequency of ECC in breastfeeding-on-demand group (34). Another cohort study that involved Southeast Asian

participants aged 25 to 30 months showed that prevalence of ECC was higher in a group of children who were breastfed more than twice during the night (35). Peres et al. stated that “breastfeeding between 13 and 23 months had no effect on dental caries, but breastfeeding after 24 months of age increased risk for severe ECC at the age of five” (36), but there is “caution needed over breastfeeding advice” (37) especially considering that almost half of the cohort sample was bottle fed at the age of five and that oral behaviours were not analyzed.

Breastfeeding beyond 12 months of age and bottle feedings on demand with any carbohydrate beverages including human milk are considered ECC risk factors because frequent or prolonged contact with dental surfaces may contribute to evolution of lesions (12,38-40). In Lancet series on breastfeeding, caries was described as the only poor health outcome in prolonged breastfeeding after first birthday (41).

Evidence opposing a link between ECC and breastfeeding

Experimental studies demonstrated that human breast milk contains several components involved in neonatal host defence (lysozyme, lactoferrin, oligosaccharides and IgA antibodies) that prevents infections during early infancy and interfere with cariogenic streptococcal colonization of oral cavity (42). Furthermore, the presence of phosphate and proteins in human breast milk enables light buffering capacity. Interestingly, the experimental results confirmed acid neutralization potential of human milk even after primary teeth were soaked in it for 12 weeks – on the other hand, when 10% sucrose was added, demineralization occurred after 3.2 weeks (43).

Having in mind the physiological mechanism of suckling that involves using intraoral vacuum, expressing the milk at the edge of transition of soft palate into hard palate, and constant moving of fluid towards pharynx without stagnation – prolonged exposure of dental surfaces is almost impossible (44). On the other hand, during the bottle-feeding, artificial nipple releases the milk or formula into the frontal parts of the mouth and enables pooling of liquid in the mouth and exposure of the dental surfaces which favours occurrence of ECC.

Epidemiological research involving children breastfed up to 21.5 months showed low rates of ECC (45-47). On the other hand, sugary snacks between meals were strongly related to poor oral health (48,49). Follow up of the cohort from birth to nine years highlighted breastfeeding shorter than 6 months as a significant risk factor for ECC, due to bottle feeding (48,50). The largest randomized trial in the field (involving 13,889 children followed from the postpartum hospital stay until the end of the first year of life), showed the absence of association between prolonged and exclusive breastfeeding and ECC (51).

Studies that involved nationally representative samples in the USA with strong methods using regression model, adjusting for confounding variables and categorizing breastfeeding duration and type, could not determine any association between length of breastfeeding and ECC (52,53). Furthermore, matching for age, race, gender, and social class in 109 children with ECC with 109 healthy children confirmed that ECC occurrence was unrelated to length or type of feeding (46). Considering complicated aetiology of ECC, applying hierarchical approach in order to eliminate potential confounders showed no association of breastfeeding with poor oral health, even with longer breastfeeding exposure (54).

Some studies confirmed that up to 24 months breastfeeding did not affected oral health, but others showed less association between breastfeeding longer than 24 months of age and risk for ECC (55).

Advantages and disadvantages of different types of studies

Current literature data revealed possible link between breastfeeding and ECC, however without evidence strong enough for the appropriate oral health preventive recommendation to be provided.

Multi causal aetiology of ECC that involves plethora of micro, meso and macro level factors makes research of the association between ECC and breastfeeding inconclusive. Therefore, the use of adjustment for confounding variables related to ECC development brings needed strong research evidence (18,53,54). The use of multivariate risk model makes precise predictions related to ECC risk, but the analysis that involves only one factor such as the relationship with breast or bottle-feeding showed poor accuracy and limited strength of evidence (56).

When analyzing how breastfeeding affects oral health, it is important to consider

and understand differences between the following forms of breastfeeding: exclusive (breastfeeding excluding any other drinks or foods, except vitamins, oral rehydration solution, supplements and medicines) , unrestricted (on-demand or ad-libitum or on cue –baby is breastfed whenever in need) (57), predominant (receiving water, tea or fruit juice besides breast milk) (58), or partial (some meals are breast milk, and some are solids) (58).

The term "prolonged breastfeeding" has been differently defined – from up to six months (59), to more than one year (46, 51, 60), 18 months (30-32) or 24 months (33). There is a strong need for the use of the Index of Breastfeeding Status (61) in oral health research in the future, since this index was created in order to precisely determine the effect of breastfeeding on health outcomes, so the use of this tool is required for the analysis of oral health outcomes, too.

Frequent breastfeeds after 12 to 18 months of age might favour the development of inadequate dietary habits, such as prolonged, frequent and in-between-meal consumption of sugary snacks or drinks, thus increasing ECC risk (62). Considering the importance of dietary habits (63), it would be more than beneficial to use adequate dietary questionnaire in studies analyzing oral health, as it has been shown that sugar rich diet favours cariogenic potential of human breast milk (43).

Although oral hygiene has one of the most important roles in maintaining oral health, less than one third (28%) of investigated papers addressed frequency of tooth brushing, use of fluorides, duration of brushing and who is brushing child's teeth (18).

Prevention of ECC

Both dental care professionals and paediatricians should have evidence-based knowledge regarding guidelines and potential health risks and be able to provide an adequate and clear information to nursing mothers. We recommend adhering to current paediatric guidelines which promote unrestricted breastfeeding until it is desired by both mother and child.

However, prevention and timely treatment of ECC must also be addressed. There is a need for better education of parents and health care providers about the risk factors, identification of initial lesions and consequences of early childhood caries. Oral health recommendations include avoiding free sugars when introducing solid foods to infant and using fluoridated toothpaste (at least 1000 ppm) and soft toothbrush twice daily, as well as timely consultation with oral health professional (64-66). It is important to inform dental professionals about the importance of breastfeeding and to update their knowledge to enable them to take active role in encouraging breastfeeding in mothers. Taken together, oral and general health care providers should establish a consensus regarding information for parents regarding breastfeeding and prevention of early childhood caries.

Conclusion

Based on presented currently available data, the association between breastfeeding and ECC is contradictory, complex and contains many confounding variables. Taken together, oral and general health care providers should establish a consensus regarding information for parents regarding breastfeeding and prevention of early childhood caries. Further research in this field is needed, especially meta-analyses.

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