

## CHILDHOOD DENTAL CARIES IN THE DENTAL OFFICE

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### Abstract

The literature regarding dental and systemic effects of Early Childhood Caries (ECC), consequences of leaving carious primary teeth untreated, benefits of appropriate treatment, and concerns regarding dental treatment of young children and the potential for dental anxiety, is reviewed. ECC has consequences, affecting both the child's dental health and his/her general health. This paper reviews the literature regarding ECC and its consequences (pain, sepsis, space loss, disruption to quality of life, failure to thrive, effects on intellectual development, greater risk of new carious lesions in both primary and permanent dentitions, higher incidence of hospitalisation and emergency visits, and increased treatment costs and time). The effects of treatment of ECC are also reviewed; and concerns regarding purported associations between treatment of ECC and dental anxiety are addressed.

**Materials and methods:** Information on oral hygiene and dietary habits, oral health behaviours and socio-demographic variables was collected using questionnaires completed by the parents. Clinical examinations were performed using standardized criteria. Caries experience was recorded at the level of cavitation.

**Results:** Multivariate analysis showed age, dental plaque, sleeping beside the mother, use of comforters and selected dietary habits to have an independent effect on caries prevalence. Dental plaque and prolonged breast feeding exerted an independent effect on caries severity and gingivitis. The strongest association with gingivitis was dental plaque.

**Conclusions:** Presence of visible plaque accumulation and reported consumption of sugared drinks were associated with prevalence of caries experience in Flemish preschool children. Severity of disease was associated with gender and with presence of plaque. Results underline the importance of plaque control and diet management from very young age on.

**Keywords:** dental caries, early childhood, fluoride varnish, prevention, primary care.

### INTRODUCTION

Severe early childhood caries (S-ECC) is recognized as a significant chronic disease which affects the quality of life starting at very young ages and has a very rapid evolution towards pulp complication and loss of dental tissue. Children with a high caries index DMFT are more likely to develop high levels of dental anxiety, which will influence the degree of cooperation during dental procedures (1). Emotions play

an important role in the psychosomatic development of children, and all the factors that contribute to the modeling of these emotional states must be known and taken into consideration (2,3).

Clinical examinations were carried out by one examiner. Mothers completed questionnaires relating to sociodemographic factors, oral hygiene behaviours, infant feeding and dietary practices of the children (4).

Health promotion strategies need to be targeted to mothers from less advantaged backgrounds. Messages about infant breast feeding should emphasise that the method is beneficial to the oral health of the children if appropriately used (6,7).

The role of diet and plaque as direct causes of oral disease has been extensively reported. It is also widely accepted that oral health status is closely linked to socioeconomic factors that are understood to be strongly associated with oral health knowledge, attitudes and behaviours. Attempts have been made, for example, to explain the variations in both caries experience and gingivitis through differences in oral hygiene habits and the use of fluoride in differing social classes (8,9).

Community SES was significantly related to caries experience in the primary teeth, the proportion of untreated caries in the primary and permanent teeth, dental treatment needs, dental sealants and incisor trauma. Overall, dental health was significantly worse for low-SES communities than for medium- and high-SES communities (10,11).

The World Health Organization has developed and published a manual. This document is based on systematic reviews and WHO recommendations. Recommendations for stopping and restoring carious lesions are similar to those observed in our study. These mainly included the use of sealants, fluoride and minimally invasive restorative techniques such as antiretroviral therapy (ART). Our study advances by presenting information on guidelines, policies and guidance from different countries, allowing an overview of the management of dental lesions. This scoping review provides a summary of the recommendations on the management of dental lesions. This broad view of what recommendations from around the world

bring can help during the development/update of guidelines, as well as help the dental team to critically review the guidelines before implementing procedures (5).

## METHODS AND MATERIALS

A Pub Med search was conducted of peer reviewed papers published in the English language in the years 2020-2025, using the search terms: Early Childhood Caries (ECC), Nursing Caries (NC), Consequences and ECC/NC, Treatment and ECC/NC, Treatment outcomes and ECC/NC, Dental anxiety, Dental fears, Onset of dental anxiety/fear, Dental experiences and dental fear/anxiety. More than 100 articles were studied. Reference lists of the selected articles were also studied, and frequently quoted articles were thus also located. Articles with small sample size, poor or poorly described methodology, and unclear or unsupportable conclusions were rejected. A representative sample is presented in this paper, citing the articles with greater levels of evidence, with a description of study methods, where appropriate.

## RESULTS AND DISCUSSIONS

Early childhood caries (ECC) affects millions of children up to 6 years old. Its treatment positively impacts the quality of life of children and their families. However, there is no consensus on how to treat ECC (12). Thus, we performed a scoping review to identify the recommended procedures for the management of ECC lesions (13).

Millions of children under years of age have early childhood caries (ECC) globally. This condition is a multifactorial and dynamic disease characterized by “the presence of one or more decayed (non-

cavitated or cavitated lesions), missing (due to caries), or filled surfaces, in any primary tooth of a child under age six” (14,15). The prevalence of this condition is closely related to the child’s age. Thus, while the mean ECC prevalence in children at 1 year of age was 17%, among those with 5-year-olds, these rates are higher than 50% (16,17).

Although scientific evidence shows that ECC treatment has definite and essential outcomes for improving the child and parents’ quality of life, approximately 732 million children worldwide have untreated cavitated lesions (18). This alarming data on dental caries and its non-treatment may reveal that low priority is given to children under 6 years of age and the failures in the primary and secondary preventive measures. Also, it should be emphasized that the treatment is technically challenging, and is often dictated by the extent of the lesions, child behavior and the costs for patients/reimbursement system for dentists (19, 20). The high prevalence of the disease, added to its impact at both individual and collective levels, the possibility of prevention and treatment performed ECC a public health problem (21,22).

Data of the included studies were extracted using a standardized data collection form designed for this scoping review (23). The following data were extracted: authors or association, year, location and recommended procedures management for ECC lesions (24). A summary of the results was provided in the text and presented in tables. The documents replaced by other updated were presented as Additional file (25).

This scoping review was performed to identify what procedures were

recommended for the management of lesions and to promote critical analysis of the information available on the guidelines/guidance/policies. Different interventions were suggested for the management of lesions, from active surveillance to extraction, depending on the disease process and the patient’s risk of caries. In fact, it is well known that the clinical decision-making for caries management on children should be based on the patient’s risk levels, current oral health status, age, and the engagement of caregivers with preventive strategies (26,27).

Active surveillance was proposed by few recommendations, and just for incipient lesions. However, considering that the surveillance is a pivotal component of caries management, it should be recommended for all patients, aiming to both arrest lesions and monitor the progression. For non-cavitated carious lesions, the use of professional fluoride associated with sealants on occlusal surfaces or with resin infiltration on approximal surfaces increase the chance of arresting or reversing lesions compared with no treatment, so whenever possible, these procedures should be performed. One cannot fail to mention, however, that for the resin infiltration, to our knowledge, just a single commercial product holds the patent so that this fact can restrict its use. When it was not available, professionals can use other approaches, such as fluoride toothpaste and dental floss, and/or fluoride varnish, although these conventional management are less effective, probably because they demand a high level of patient compliance (28,29).

The use of fluoride toothpaste has been recommended in a few documents,

although it is easy to apply and is currently recommended as a prevention measure secondary to ECC. However, the recommendations are not out of date. This information has recently been discussed, and it is recommended that for all children a concentration of at least 1000 ppm fluoride should be used for twice-daily brushing, following the recommended amount of toothpaste for each age. For children under 3 years old, the amount of fluoride toothpaste corresponding to smear size is recommended, while children under 3–6 years old should use the amount corresponding to pea-size (30).

Considering that around 9% of pediatric patients presented dental fear/anxiety or dental behavior management problems, a portion of the child population may need the use of pharmacological behavior management techniques to perform the dental treatment, but just six documents considered this possibility. Sedation and general anesthesia aimed to provide safe and effective dental care and had proved to improve the child's behavior in the dental chair along the time and to improve the oral health-related quality-of-life, respectively (31).

## CONCLUSION

The authors conclude that all specific dental indexes used to measure children's dental health in this study, with the exceptions of caries experience in the permanent teeth and sealant presence, were inversely related to the

communities's SES. The percentage of children with dental sealants was directly related to the community's SES.

Further improvements in oral health will necessitate that community-based preventive programs and access to quality dental care be made available to children who are identified as being at highest risk of experiencing oral disease.

Causes of dental anxiety are multifactorial. Children with the highest levels of dental disease are primarily from disadvantaged communities. Failure to adequately treat their dental disease may further disadvantage these children. Paediatric Dental Societies, renowned experts in Paediatric Dentistry, and the Medical Protection Society do not support a policy of leaving carious primary teeth untreated.

Management of capsular caries involves consideration of the extent of carious lesions and the characteristics of the children, such as their behavior. The documents reviewed are similar in their recommendations; the most indicated procedures were non-operative (such as active surveillance, use of professional fluoride associated with sealants on occlusal surfaces or resin infiltration on approximal surfaces to arrest or reverse lesions), restorative, and extraction.

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