

# Is there an association between prenatal oral healthcare and early childhood caries prevention?

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## A Commentary on

Xiao J, Alkher N, Kopycka-Kedzierawski D T et al.

Prenatal Oral Health Care and Early Childhood Caries Prevention: A Systematic Review and Meta-Analysis. *Caries Res* 2019; DOI: 10.1159/000495187.

## Abstract

**Data sources** Database searches included Pubmed, Embase, Scopus, Web of Science, LILACS, Cochrane Library and ClinicalTrials.gov.

**Study selection** This review included studies that assessed the impact of pre-natal oral health care on early childhood caries experience and/or oral carriage of *S. mutans*. The review included case control studies, retrospective or prospective cohort studies, randomised or non-randomised controlled trials. In vitro studies, animal studies, literature reviews, cross sectional studies and literature reviews were excluded.

**Data extraction and synthesis** Two calibrated and independent reviewers screened the literature using a data extraction form based on defined inclusion and exclusion criteria. A PRISMA flow diagram is presented showing the process of reviewing the literature. The Cochrane Risk of Bias Tool for Randomised Trials and an adapted version of the Downs and Black score were used to assess the quality of the included studies. A qualitative synthesis of five included studies is presented. A Forest Plot then presents quantitative data from four of the studies. A meta analysis did not take place. A generalised linear mixed effects model was applied to results from four of the studies.

**Results** Five studies were included in the qualitative syntheses, three of the studies were randomised controlled trials, one was a prospective cohort study and one was a nested case-control in a cohort study. Two of the studies were assessed as high quality with three assessed as moderate quality. Odds ratios of children experiencing early childhood caries are reported for four studies demonstrating a reduced risk of early childhood caries in intervention groups compared to controls. A generalised linear mixed effects model using combined results from the four studies shows a reduced risk of developing early childhood caries in children up to the age of three years old whose mothers receive pre natal oral care. Above age three years the results of the modelling become non-significant.

Based on the results of two studies the authors report a reduction in levels of *S. mutans* in the oral cavity of children whose mother had prenatal oral care.

**Conclusions** The authors conclude that prenatal oral healthcare has a positive effect on incidence of early childhood caries and *S. mutans* carriage in children.

## Practice point

Oral healthcare is important throughout the life course; women who are pregnant may experience adverse oral health outcomes and should be supported to maintain their oral health. Clear and consistent advice in early childhood regarding feeding practices, weaning and oral care such as toothbrushing are essential to support parents to give their child the best possible chance for good oral health.

## Commentary

Early childhood caries is defined in this paper as ‘the presence of  $\geq 1$  decayed, missing (due to caries) or filled tooth surface in primary teeth in a child 71 months of age or younger’<sup>1</sup> Caries can have significant consequences for young children, including pain, infection, loss of sleep and possible effects on speech development, nutrition and growth.<sup>2</sup> Despite significant improvements in child oral health in recent years, during school year 2017–18 almost 30% of five-year-old children in Scotland undergoing detailed inspection as part of the National Dental Inspection Programme had evidence of caries experience.<sup>3</sup> For young children affected by dental caries, treatment often involves extraction of teeth under general anaesthetic, with each procedure carrying a small, but significant risk. Prevention of early childhood caries is essential to avoid young children experiencing the negative impacts of the condition. This systematic review explored the potential for antenatal care to reduce the risk of developing early childhood caries.

The review began with a clearly defined question but in trying to answer the question reviewed papers that had broadly different interventions and heterogeneity. The definition of pre-natal oral care is not defined and the authors have encompassed interventions including oral health education, fluoride supplements and oral examination. The review did include relevant study types appropriate to the research question and intervention under scrutiny. The search strategy, reported using PRIMSA, was restricted to online databases and is subject to publication bias as there is no mention of searching grey literature, non-English language texts, follow up of reference lists or contacting of experts. The time period covered within the search has not been stated.

Assessment of quality could be improved by using more robust and up to date tools. For example use of the Cochrane Risk of Bias in Non-randomised Studies of Interventions would have been a suitable alternative to an adapted Downs and Black score.<sup>4</sup> Further to this the authors have applied the Cochrane Risk of Bias tool for randomised trials to non-randomised studies.<sup>5</sup> The table for reporting the outcomes of the risk of bias tool has a mistake in the key, making it difficult to understand the risk of bias assigned to each paper using the table.

The review has stated that a meta analysis of the results took place, this does not appear to be presented in the paper. The

GRADE rating



Forest Plot does not have a summative diamond representing the combination of results and it is not described in the text. In any case it would be inappropriate to combine the results from these studies based on the I<sup>2</sup> result of 75.06% suggesting a high level of study heterogeneity.

The authors have converted the primary outcomes reported in some of the included papers from DMFT into a proxy: early childhood caries. The results from one included paper were split into two cohort age groups and treated as separate studies. Figure 4 contains a mistake making it impossible to tell which age cohort the reported odds ratios relate to in the Gúnay study as both are reported as three years old. A generalised linear mixed effects model is presented in the same figure using combined results from four of the studies. As stated earlier the heterogeneity amongst the studies is high and the benefit of this model is therefore unclear.

Detail on the participants in the trials was not detailed making it difficult to apply the results from the review to a local setting. More detail on the demographics of the mothers included in the studies and accounting for confounding factors such as socio-economic status should be considered.

The authors have attempted to summarise and synthesise the available evidence regarding pre-natal oral healthcare and the link to early childhood caries. The authors recognised the complexity in studying this topic, with multiple factors being involved in the development of early childhood caries yet they have been unable to account for and deal appropriately with this

in the final analysis they present. Due to the methodological limitations in the paper, no sound conclusions on the effect of pre-natal oral healthcare on early childhood caries can be drawn. This review does, however, prompt us to ask how we approach pre-natal oral healthcare, and what we might do to prevent caries in early childhood.

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