


Early Maternal Exposure to Children's Oral Health may be Correlated with Lower Early Childhood Caries Prevalence in Their Children

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Article Title and Bibliographic Information

Reassessment at 6-7 years of age of a randomized controlled trial initiated before birth to prevent early childhood caries.

Plutzer K, Spencer AJ, Keirse M.

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Reviewer

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Purpose/Question

Will providing mothers with guidance during pregnancy drastically reduce the prevalence of early childhood caries at 20 months of age and be sustained at 6 to 7 years of age?

Source of Funding

Supported with government funding from the NHMRC Centre of Clinical Research Excellence, Adelaide, South Australia.

Type of Study/Design

Randomized controlled trial

Level of Evidence

Level 2: Limited-quality, patient-oriented evidence

Strength of Recommendation Grade

Not applicable

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Summary

Subjects

In 2002, women ($n = 649$) expecting their first child were enrolled in a study to prevent severe early childhood caries (S-ECC). Women were randomized into an intervention group ($n = 327$) and a control group ($n = 322$), and both groups were followed for 20 months. Results from this early follow-up period have been published elsewhere.¹ In 2008, 625 of the women were approached for long-term follow-up ($n = 312$ from the initial intervention group and 313 from the initial control group). An additional 641 women with children born in 2002 were approached to serve as a comparative cohort. After enrollment, there were 141 women in the intervention group, 136 in the control group, and 277 in the external comparison group. In 2010, there were 96 remaining in the intervention group, 91 in the control group, and 262 in the external comparison group. In 2009, the study group completed a “Child Oral Health Survey” questionnaire, and in 2010, dental records of South Australian School of Dental Services were retrieved. Nearly 80% of parents have their children enrolled in the School Dental Services program.

Key Risk/Study Factor

The key study factor was evaluating the impact of oral health education for new mothers on the prevalence of early childhood caries (ECC) in their children. Intervention was based on a series of oral promotion activities and was designed to encourage mothers to take a proactive approach to their children’s oral health.

Main Outcome Measure

Decayed, missing, or filled tooth surfaces or teeth (dmfs or dmft) in the primary dentition.

Main Results

At age 6 to 7 years, children participating in the trial were less likely to have dental caries compared with children in the external comparison group (33% vs 42%). All measures of caries severity were lower in the intervention group compared with the control group, but the differences were not statistically significant. Twenty-nine percent of mothers from the comparison group reported that their children suffered from toothache versus 11% in the intervention group ($P < .001$) and 17% in the control group ($P < .001$). For the caries severity index SiC₃₀, the difference between the intervention group and the external comparison group was significant ($P > .001$). None of the logistic regression models showed a significant association between the intervention group and either of the 2 types of control groups.

Conclusions

Exploring methods of engaging all new mothers in preventive strategies may help to stem early childhood caries and its ill effects on children, families, and society. Providing adequate information and guidance is good practice and is relatively inexpensive. Effective ECC Prevention strategies would provide disease management benefits that are cost-effective and can be sustainable for several years.

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Commentary and Analysis

The authors' conclusions are in concurrence with the widely supported notion of early intervention for preventing early childhood caries (ECC) through maternal education and individual personal involvement. Primary caregivers play an important role in the oral health of their children.¹ Therefore, the ideal stage for intervention is with expectant mothers who are more receptive to ideas that would improve their offspring's oral health.² The US Department of Health and Human Services Maternal and Child Health Bureau's Life Course Model suggests "the need to: refocus resources and strategies for a greater emphasis on early ('upstream') determinants of health; incorporate earlier detection of risks coupled with early intervention; and promote protective factors while reducing risk factors at the individual, family and community levels."^{3, 4} Furthermore, early intervention for ECC is imperative, as detrimental consequences of ECC are long lasting, with research indicating that caries in the primary dentition is a strong predictor of caries in the permanent dentition.⁵

This article provides the results of a clinical trial to evaluate the longer-term efficacy of an early oral health education program for pregnant mothers and their firstborn offspring through the age of 6 to 7 years. The results should affect the way readers conduct their practices, as it shows that early parental sensitization to children's oral health generates a significant impact in positively improving rates for early childhood caries prevalence and incidence. A direct application of this would be to increase the distribution of young children's oral health materials and counseling in clinical places targeting expectant and new mothers from high-risk communities. This study has also discovered that mothers of all socioeconomic levels are equally interested and engaged in their children's overall health; however, mothers of lower social strata and income levels have major barriers of access to the educational information in a culturally sensitized matter. Therefore, another application would be to increase the access to children's oral health education for mothers of lower socioeconomic status in a culturally competent format. The methodology presented adds to the current evidence in support of early oral health education and outlines a methodology that identifies needed areas for improvements in the prevention counseling protocol, and recommends replication of the model for other settings, countries, and so on, so as to collect additional supporting evidence outcomes data that caregivers play a crucial role in the oral health of their children. Although a previously published article is cited, key pieces of information, such as determination of the sample size and the study's randomization and consent processes, which may have affected the actual statistical power, should have been noted and referenced in this article.

The authors recognize that a lack of examiner calibration for all dental records used in the study is an issue. In addition, they acknowledge a contamination bias between the control and intervention randomization groups; however, no mention is made of how any prior oral health parental education in the comparison group was identified, controlled for, or statistically accounted for. It was also not made clear in this article, what, if any, effect resulted from the structured telephone consultation at 6 and 12 months conducted with 50% of the intervention group. Furthermore, a discussion on the elements of the questionnaire completed and any behavioral patterns derived from that analysis would have been associated to the article's discussion.

Based on the information provided in the article, it is not possible to determine any additional biases that could have resulted. For example, the percentage of children at age 6 to 7 years who were brushing their own teeth, who were supervised during brushing, and whose parents were still actively participating in assisting them in brushing their own teeth. Key behaviors practiced, such as the frequency of dental visits from 20 months to follow-up at age 6 to 7 years, would also be important data to understand (ie, did the perinatal training result in behavior changes in diet, but a recall follow-up or dental home efforts were not established?). The materials provided were also very basic and did not recognize the relevance concept of individualized caries risk assessment. Although great efforts were made to ensure fidelity of the information supplied to all participants, they were not all equal in their risk for developing S-ECC. Therefore, the impact on caries incidence may have been affected by not having uniform information throughout all study participants that could have lowered caries for those at highest risk.

The study's retention, diversity, and blinding strategies are among its strengths. The greatest strength of this research is what it adds in support of the need and efficacy for increased oral health education for expectant and new mothers and parental counseling. Although this study has made an important contribution to the scientific literature, results from additional high-quality randomized trials will be needed to definitively help guide clinicians in their decision making and rapport with their patients to prevent early childhood caries.

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