
Twetman, S

CRD summary
The author concluded that although there was evidence for the use of fluoride in preventing early childhood caries, further high-quality studies were required to establish the best way to maintain oral health in infants. In view of the methodological limitations of the review, the authors’ conclusions should be interpreted with caution.

Authors' objectives
To evaluate the effectiveness of methods used to prevent early childhood caries.

Searching
PubMed was searched for studies published in English between 1998 and 2007. Search terms were reported. Reference lists of two recent systematic reviews were screened.

Study selection
Prospective controlled studies that evaluated non-invasive primary or primary-primary (mother-child interventions) methods to prevent early childhood caries in young children were eligible for inclusion. Interventions had to be implemented before the age of three years. The primary review outcome was the incidence or percentage of cavitated or non-cavitated clinical caries. Studies that evaluated community oral health interventions based on water, milk or salt fluoridation were excluded.

The included studies evaluated dental health education, fluoride or fluoride-based community interventions (fluoride provided as free toothpaste, pacifier, tablet, liquid and varnish), antimicrobials (povidone iodine, chlorhexidine varnish and probiotics), a fluoride-releasing filling material and mother-child prevention (see Results for details). Most interventions involved combinations of preventive measures. Where reported, the duration of follow-up ranged from seven months to five years.

One reviewer selected studies.

Assessment of study quality
Studies were graded as high, medium or low quality as described by Twetman et al (2003). Criteria assessed included allocation method, sample size, placebo control, attrition, blinding and validated outcome assessors. The author did not state how the validity assessment was performed.

Data extraction
The author stated neither how data were extracted for the review nor how many reviewers performed the data extraction. For each study, early childhood caries findings were reported as significant, not significant, less or limited effect.

Methods of synthesis
The studies were grouped by intervention and combined in a narrative synthesis. In addition, studies were graded from A to D using systems described by the Agency for Health Care Policy and Research (AHCPR) and Ismail (1998).

Results of the review
Twenty-two studies were included (n not reported): 14 RCTs; two matched cohorts; three non-randomised studies; one controlled clinical trial; one cohort study with historical control; and one cross-sectional study.

Dental health education (five studies): Three medium quality RCTs reported a significant reduction in early childhood caries in intervention groups. Two low quality matched cohort studies reported no significant reduction.

Fluoride or fluoride-based community interventions (six studies): Five studies (two medium quality RCTs, one low
quality RCT, one low quality controlled clinical trial and one low quality cohort study) reported a significant reduction in early childhood caries in intervention groups. One low quality cross-sectional study reported no significant reduction.

**Antimicrobials (four studies):** Three RCTs (two medium and one low quality) reported no significant reduction in early childhood caries. One low quality RCT reported a significant reduction in white spots associated with the intervention.

**Dental material (one study):** One medium quality RCT reported no significant reduction in caries with glass ionomer cement.

**Mother-child prevention (six studies):** All but one study reported positive intervention effects. Two medium quality RCTs reported fewer caries in children whose mothers chewed xylitol gum during the tooth eruption period compared with fluoride or chlorhexidine varnish or gum. Three low quality non-randomised studies reported a significant reduction in early childhood caries in intervention groups. One low quality RCT reported a limited effect on early childhood caries of a comprehensive preventative programme.

**Authors’ conclusions**
Although there was evidence for the use of fluoride in preventing early childhood caries, further high-quality studies were required to further establish the best way to maintain oral health in infants.

**CRD commentary**
The review question and inclusion criteria were clearly stated. Limiting the search to English-language reports listed in one database (or references) may have resulted in the omission of other relevant studies and raised the potential for publication and language biases. Only one reviewer selected studies and the methods used to assess validity and extract data were not described, so there was potential for reviewer errors and bias. Study validity was assessed, but generally only a grading level was provided which made it difficult to independently comment on the reliability of the evidence presented. In view of the diversity among studies, a narrative synthesis was appropriate. Neither sample size nor results data were reported for individual studies, which made it difficult to assess the strength of the evidence. In view of the methodological limitations of the review, the authors’ conclusions should be interpreted with caution.

**Implications of the review for practice and research**
**Practice:** The author did not state any implications for practice.

**Research:** The author stated that further well-designed, high-quality and adequately powered studies that included an economic analysis were required to determine the optimal methods to maintain oral health in infants. Further studies were required to evaluate the effect of 10% iodine solution and xylitol-based mother-child interventions.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.