

Limited evidence suggests standard fluoride toothpaste reduces caries potential in preschool children

Abstracted from

Dos Santos AP, Nadanovsky P, de Oliveira BH.

A systematic review and meta-analysis of the effects of fluoride toothpastes on the prevention of dental caries in the primary dentition of preschool children. *Community Dent Oral Epidemiol* 2012; doi: 10.1111/j.1600-0528.2012.00708.x. [Epub ahead of print] PubMed PMID: 22882502.

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Question: How effective is fluoride toothpaste in preventing dental caries in the primary dentition of preschool children?

Data sources CENTRAL, Medline, Embase, Web of Science, LILACS and BBO databases, the Brazilian database of thesis and dissertations (Banco de Teses CAPES), a Brazilian register of ethically approved projects involving human beings (SISNEP) and two registers of ongoing trials (Current Controlled Trials and Clinical-Trials.gov). Reference lists were also scanned for relevant papers. Study authors were contacted for additional information.

Study selection Individual or cluster-randomised or quasi-randomised controlled trials conducted in children under seven were included.

Data extraction and synthesis Study selection and data abstraction were conducted by two reviewers independently. Risk of bias assessment was undertaken using the Cochrane Collaboration tool. Meta-analyses of prevented fractions (PF) were performed to assess the effect of fluoride toothpaste on the dmft and dmfs. Meta-analyses were also performed to obtain a pooled relative risk (RR) to assess the effect of fluoride toothpastes on the proportion of children developing caries.

Results Eight studies were included. When standard F toothpastes were compared to placebo or no intervention, significant caries reduction at surface (PF = 31%; 95% CI 18-43; 2644 participants in five studies), tooth (PF = 16%; 95% CI 8-25; 2555 participants in one study) and individual (RR = 0.86; 95% CI 0.81-0.93; 2806 participants in two studies) level were observed. Low F toothpastes were effective only at surface level (PF = 40%; 95% CI 5-75; 561 participants in two studies).

Conclusions Standard F toothpastes are effective in reducing dental caries in the primary teeth of preschool children and thus their use should be recommended to this age group.

Commentary

Dental caries is a common problem in preschool children that may lead to dental pain and subsequent restorative intervention or extraction of deciduous teeth. Adopting preventive measures could decrease the incidence of dental caries. Of these preventive measures, fluoride toothpaste is considered to possess an anti-caries potential. This review aims to discover the anti-caries potential of fluoride toothpaste on preschool children.

A comprehensive search was performed including four trial

registries, six electronic databases, meeting abstracts of two organisations, checking reference lists of eligible trials, email correspondence with field specialists and finally hand searching of 16 dentistry journals.

Randomised and quasi-randomised studies were included, excluding those with follow-up shorter than one year. Study selection and data extraction were performed in duplicate. Disagreements were resolved by consensus after consulting a third examiner. The search strategy resulted in 159 studies, of which eight studies were included.

A reference list of excluded studies was not provided either in the article nor in online appendices. Quality of included studies was determined using Cochrane Collaboration risk of bias tool, while publication bias was not assessed.

Fluoride concentration in included studies was divided into low (440 to 500 ppm) and standard (1000 to 1500 ppm). Three outcomes were assessed; dmfs caries increment, dmft caries increment and proportion of children developing caries. Meta-analysis of the third outcome shows that standard fluoride toothpaste reduces caries potential in preschool children by 14% compared to no intervention. Meanwhile, low fluoride toothpaste resulted in a non-statistically significant pooled estimate. Therefore, the authors recommend the use of standard fluoride toothpaste in preschool children.

The authors' recommendation should be considered with caution. First, three out of eight included studies performed adequate sequence generation, allocation concealment and blinding while the five remaining studies showed a high risk of bias.

Nevertheless, all eight studies were included in the meta-analysis, which poses a threat on the validity of the final pooled estimate. Second, this systematic review discussed the effectiveness of different fluoride toothpaste concentrations, while disregarding their potential adverse effect namely 'dental fluorosis'.

A recent systematic review showed a tendency for decreased fluorosis when using fluoride toothpaste with lower concentration.¹ Therefore, the search should continue to discover the optimum fluoride concentration with maximum anti-caries benefit and minimal fluorosis potential.

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1. Wright JT, Hanson N, Ristic H, Whall CW, Estrich CG, Zentz RR. Fluoride toothpaste efficacy and safety in children younger than 6 years: A systematic review. *J Am Dent Assoc* 2014; **145**: 182-189.

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