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Mouthrinses and dentifrices are effective antigingivitis and antiplaque agents

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Summary

Subjects—Systematic review of 6-month RCT that evaluated the antigingivitis and antiplaque properties of dentifrices or mouth rinses in adults 18 years and older. A total of 50 studies identified that met inclusion criteria. Subject characteristics not otherwise specified.

Exposure—Mouthrinse use or Dentifrice use

Main Outcome Measure—Gingivitis, as measured by the Gingival Index (GI) or Modified Gingival Index (MGI) and Plaque accumulation (as measured by Turesky modification of the Quigley-Hein Index)

Main Results—The meta-analytic results were expressed as the standardized mean effect (i.e., active agent minus control divided by the standard deviation). This was used as a measure of the relative strength of the active agent, and the summary results presented as the Standardized Difference (Std.Diff.).

As measured by the GI, mouthrinses containing 0.12 % chlorhexidine (Std.Diff. = 0.563), or essential oils (Std.Diff. = 0.306), had a significant antigingivitis effect. Dentifrices containing triclosan with 2% Gantrez copolymer (Std.Diff. = 0.858), or stannous fluoride (Std.Diff. = 0.441) also had a significant antigingivitis effect.

As measured by the MGI, essential oils (Std.Diff. = 0.762) had a significant antigingivitis effect.

Mouthrinses containing cetylpyridium chloride had significant antigingivitis effects in several individual studies, but no meta-analytic conclusion was reached due to “both statistical heterogeneity and a variety of formulations evaluated.”

Conclusions—Mouthrinses containing 0.12 % chlorhexidine or essential oils, and dentifrices containing triclosan with 2% Gantrez copolymer or stannous fluoride, each have significant antigingivitis effects in adults after six months of use.

Commentary and Analysis

Level of Evidence: 1a

Grade of Recommendation: A – Evidence is strong in support of the conclusions.

Extensive time and effort is routinely expended by dental hygienists and dentists in promoting good oral hygiene by patients. Such efforts are often aimed at preventing the initiation or

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PURPOSE/QUESTION: Evaluate the efficacy of dentifrices and mouthrinses as antigingivitis and antiplaque agents including in adults.

progression of periodontal diseases in adults. The prevention of plaque accumulation and gingival inflammation are typically hallmarks of this approach. Recommendations made by professionals for appropriate self-care behaviors typically include routine daily dentifrice use and often also include the adjunctive use of mouthrinses. The antiplaque and antigingivitis effects of dentifrices and mouthrinses are also widely promoted by the manufacturers of many products.

There exists an extensive peer-reviewed literature, and commercial literature, on the efficacy of such products, including numerous reports of randomized controlled trials. However, given the multiplicity of products tested and the variability in study designs and outcome measures used, it is often difficult for oral health care providers to give patients well balanced and scientifically informed recommendations.

The excellent systematic review and meta-analysis conducted by Gunsolley (1) is thus a much needed contribution to the subject. Moreover, it is a superb example of a methodologically rigorous systematic review of an extensive and highly complex literature. It successfully answers a highly clinically relevant and should serve as a valuable guide in clinical practice.

He identified a large number of individual studies that supported the efficacy of various products, including both dentifrices and mouthrinses, in their ability to decrease plaque accumulation and gingival inflammation. After applying a well defined set of criteria by which to include studies in his meta-analysis, he was able to identify several specific formulations of dentifrice and mouthrinse that had both statistical and clinical significance in their antiplaque and antigingivitis effects.

However, the broader significance of these findings remains in question. As Gunsolley notes, “the goal of antiplaque, antigingivitis agents is to decrease gingival inflammation so that destructive periodontal disease will not develop.” Nevertheless, it remains unclear “what level of reduction is necessary to decrease or prevent periodontal disease.” While there is evidence that gingivitis may be considered a necessary, though perhaps insufficient, prerequisite for periodontitis, the role of gingivitis as a periodontitis risk factor remains problematic (2).

The role of personal oral hygiene behaviors, including mechanical plaque removal, in risk for chronic periodontitis has been recently questioned by Hujoel et al. (3) in a systematic review. Surprisingly, they found a paucity of convincing evidence, from either randomized controlled trials or epidemiologic studies, supporting a role for plaque control in prevention of chronic periodontitis. In fact, they concluded that “behavior changes should not be recommended unless evidence exists to support their effectiveness” and that the evidence was lacking for making many such recommendations in periodontitis prevention. Interestingly, similar concerns appear to exist in regards to professionally delivered preventive interventions. Recently, in a systematic review of professional mechanical plaque removal for prevention of periodontal diseases, Needleman et al. (4) found only weak to moderate evidence in support of professional preventive interventions, in combination with personal oral hygiene, in periodontitis prevention, and the magnitude of the benefit remained modest. Their work also highlighted the extent to which the field has relied on the use of surrogate measures and the limitations that such presents. Of course, studies using true outcomes such as tooth loss are inherently lengthy and difficult to carry out. However, Kressin et al. (5) have earlier reported the results of one such observational epidemiologic study, using a longitudinal design with follow-up over a decade. They found, in multivariate analyses controlling for relevant covariates, that long-term hygiene behaviors were positively associated with decreased subsequent tooth loss in adult men.

While we may still lack conclusive, highest quality evidence that efforts aimed at controlling plaque and gingivitis are effective in regards to preventing periodontitis or tooth loss, it is clear

from the excellent work of Gunsolley that there do exist several effective mouthrinses and dentifrices whose use will yield patients significant benefit in the control of plaque and gingivitis. The rationale for the use of such products and preventive modalities in periodontitis prevention has been earlier presented by various experts (6,7), but conclusive proof of their long-term benefits in regards to true outcomes remains to be demonstrated.

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TYPE OF STUDY/DESIGN: Systematic review with meta-analysis of 6-month RCT that evaluated both the antiplaque and antigingivitis properties of dentifrices or mouth rinses in adults.

References

1. Gunsolley JC. A meta-analysis of six-month studies of antiplaque and antigingivitis agents. *J Amer Dent Assoc* 2006;137:1649–1657. [PubMed: 17138709]
2. Dietrich T, Krall Kaye E, Nunn ME, Van Dyke T, Garcia RI. Gingivitis susceptibility and its relation to periodontitis in men. *J Dent Res* 2006;85:1134–1137. [PubMed: 17122168]
3. Hujuel PP, Cunha-Cruz J, Loesche WJ, Robertson PB. Personal oral hygiene and chronic periodontitis: a systematic review. *Periodontol 2000* 2005;37:29–34. [PubMed: 15655023]
4. Needleman I, Suvan J, Moles DR, Pimlott A. A systematic review of professional mechanical plaque removal for prevention of periodontal diseases. *J Clin Periodontol* 2005;32:229–282. [PubMed: 16128841]
5. Kressin NR, Boehmer U, Nunn ME, Spiro A. Increased preventive practices lead to greater tooth retention. *J Dent Res* 2003;82:223–227. [PubMed: 12598553]
6. Lamster IB. Antimicrobial mouthrinses and the management of periodontal diseases: Introduction to the supplement. *J Am Dent Assoc* 2006;137:5S–9S. [PubMed: 17035669]
7. Barnett ML. The rationale for the daily use of an antimicrobial mouthrinse. *J Am Dent Assoc* 2006;137:16S–21S. [PubMed: 17035671]