

# Chlorhexidine mouthwash more effective than dentifrice or gel

## Abstracted from

**Supranoto SC, Slot DE, Addy M, Van der Weijden GA.**

The effect of chlorhexidine dentifrice or gel versus chlorhexidine mouthwash on plaque, gingivitis, bleeding and tooth discoloration: a systematic review. *Int J Dent Hyg* 2015; **13**: 83–92.

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## Question: Is chlorhexidine dentifrice or gel more effective than chlorhexidine mouthwash on plaque levels, gingivitis, bleeding and tooth discoloration?

**Data sources** Medline, Embase and the Cochrane Central Register of Controlled Trials (CENTRAL).

**Study selection** Randomized controlled trials (RCTs) or controlled clinical trials (CCTs) in adults  $\geq 18$  years of age comparing CHX DF/gel with CHX MW written in English or Dutch were considered.

**Data extraction and synthesis** Two reviewers independently selected studies, abstracted data and assessed risk of bias. Where possible, a meta-analysis was performed. Difference in means values between test and control at both baseline and end was calculated using a fixed-effects model.

**Results** Five RCTs were included, four had a parallel design and one was a cross-over trial. Three studies showed a positive score in favour of the mouthwash. Three studies contributed to a meta-analysis of the effect on 'de novo' plaque formation. There was a difference in means of 0.27 [95% CI: 0.14; 0.39] ( $P < 0.0001$ ) in favour of CHX MW. One study assessed tooth staining finding more staining with the use of CHX MW compared to the CHX DF/gel.

**Conclusions** Chlorhexidine gel can be successfully formulated and will inhibit plaque growth to some degree, but not to the same extent, as a CHX MW. When CHX DF/gel is used in a non-brushing model, it is significantly less effective in plaque inhibition compared to CHX MW. Based on one study when CHX gel was applied with a finger after brushing, it is significantly more effective on plaque scores and the gingival index. The only brushing study also with a long follow-up showed that there is no significant difference between CHX DF and CHX MW. However, as a corollary, significantly more tooth discoloration was observed with the CHX MW. Altogether, the data show that when daily oral hygiene cannot be performed, CHX MW is the first product of choice.

## Commentary

Mechanical control of plaque is the first line in the prevention of periodontal disease but because this has its limitations adjunctive chemical control may have a role. Two earlier systematic reviews have looked separately at the effectiveness of chlorhexidine dentifrice or gel<sup>1</sup> and mouthwash<sup>2</sup> on plaque and the clinical parameter of gingival inflammation and tooth discoloration. The mouthwash review, which was summarised in this journal<sup>3</sup>, demonstrated significant reductions in plaque and gingivitis scores

but also significant increases in tooth discoloration. The dentifrice review also demonstrated some effectiveness in the control of plaque and gingivitis with the side effect of tooth discoloration. This new review directly compares dentifrice and mouthwash.

The reviewers had adopted a sound methodological approach following the PRISMA guidelines. Three major databases were searched and only randomized controlled trials or controlled clinical trials were included, although only English and Dutch language papers were considered which might have resulted in missing some relevant studies. Five RCTs were included with risk of bias being considered to be low in four out of five. There was variation between the studies in terms of study design, participants, evaluation period, oral prophylaxis, intervention regimen, outcome variables and results, with three studies using a non-brushing design compared to brushing in the other two studies. The one trial with a cross-over design only included a small number of participants and investigated six separate regimens for a five day period each. Two of the other studies used a test period of just three days while the remaining studies used periods of six weeks (one study) and six months (two studies). The shorter duration studies were non-brushing in order to assess de novo plaque accumulation.

The earlier review<sup>2</sup> had demonstrated the anti-plaque and anti-gingivitis effects of CHX MW and its side effects such as staining of teeth, fillings and the tongue. Impaired taste sensation, increased formation of supragingival calculus and occasionally mucous membrane irritation and desquamation are well established as is the impact on patient compliance and so limits its daily use. This review demonstrates better performance for the mouthwash than the dentifrice or gel. However, because of the small number of studies and their heterogeneity the authors only graded the quality of the evidence for the effect on plaque scores as moderate and gingival index as low. This means that further research is very likely (in the case of gingival index) to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

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