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File: ■ Turmeric (*Curcuma longa*)
■ Chlorhexidine Gluconate
■ Dental Plaque
■ Gingivitis

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RE: Comparative Study of Chlorhexidine Gluconate and Turmeric Extract Mouthwashes for Dental and Gingival Health

Waghmare PF, Chaudhari AU, Karhadkar VM, Jamkhande AS. Comparative evaluation of turmeric and chlorhexidine gluconate mouthwash in prevention of plaque formation and gingivitis: A clinical and microbiological study. *J Contemp Dent Pract*. 2011;12(4):221-224.

Periodontal disease and gingivitis affect a majority of the population and are thought to be caused by bacterial plaque. Toothpastes and mouthwashes are the best adjunct to mechanical cleaning for plaque build-up, and the dentistry gold standard compound for plaque is chlorhexidine gluconate (CHX). It does have adverse side effects, such as discoloration of the teeth, bitter taste, and mucosal erosion, and alternative remedies are desirable. Turmeric (*Curcuma longa*) has a number of properties such as anti-inflammatory, antioxidant, and antimicrobial activity that could make it a useful dental preventative treatment. This randomized, double-blind, comparative study examined the efficacy of CHX and turmeric mouthwashes in healthy, young adults.

The study was conducted in the Department of Periodontology, Bharati Vidyapeeth Dental College and Hospital, Pune, India. Subjects (aged 25-35 years) having fair to poor Loe and Silness gingival index scores and Turesky-Gilmore-Glickman modified Quigley-Hein plaque index scores >1 were included in the study. Exclusion criteria included those with systemic diseases, those wearing oral appliances or whose habit it was to breathe out of their mouth, pregnant or lactating females, and smokers. The study included 100 subjects who were randomly given either CHX mouthwash (ICPA Health Products Limited; Maharashtra, India) or turmeric mouthwash (10 mg curcumin extract dissolved in 100 ml of water with a peppermint flavoring agent added; no information on the source of the curcumin extract given). Subjects (n=50 in each group) were asked to gargle with 10 ml of mouthwash in a 1:1 dilution with water twice a day after brushing. Subjects recorded their use of the mouthwash as a check of compliance, and oral hygiene instructions were given at the beginning and again to those whose compliance faltered during the course of the study. Both the gingival index and plaque

index scores were recorded on days 0, 14, and 21. Plaque was collected from the tooth surface of 5 subjects in each group and analyzed for bacteria on days 0 and 21.

Both groups had a significant decrease in the plaque index from baseline after 14 days, and an even greater decrease after 21 days (CHX 1.59 ± 0.33 and 2.48 ± 0.48 below baseline, respectively, $P < 0.01$ for both; and turmeric 1.27 ± 1.86 and 2.05 ± 0.48 below baseline, respectively, $P < 0.01$ for both). There was a statistically significant difference in the plaque index between the 2 groups in favor of the CHX mouthwash (74.36% decrease for CHX and 61.76% decrease for turmeric, from day 0 to day 21, $P < 0.05$). Both groups also had a significant decrease in the gingival index from baseline after 14 days, and an even greater decrease after 21 days (CHX 0.90 ± 0.15 and 1.04 ± 0.67 below baseline, respectively, $P < 0.01$ for both; and turmeric 0.90 ± 0.12 and 1.1 ± 0.11 below baseline, respectively, $P < 0.01$ for both). A reduction in the gingival index shows a reduction in inflammation. There was no statistically significant difference in the gingival index between the 2 groups. There was a significant reduction in the total bacterial count of both groups after 21 days, down 126.87 ± 51.6 for CHX and down 178.68 ± 28.92 for turmeric (volume units not given; $P < 0.05$ for both), but there was no difference between the groups.

Both mouthwashes showed efficacy and reduction of inflammation and plaque count, with the CHX mouthwash scoring better on the plaque index. The authors suggest that a possible mechanism of action of the turmeric mouthwash could be "its inhibitory action on prostaglandin synthesis and a strong stabilizing action on the lysosomal membranes." They conclude that turmeric mouthwash could be a good adjunct to mechanical plaque control. Further study is suggested to determine optimal concentration for antiplaque activity and individual periodontopathogen sensitivity.

—Risa Schulman, PhD

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