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Adjunctive benefit of an essential oil-containing mouthrinse in reducing plaque and gingivitis in patients who brush and floss regularly

A six-month study

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Mechanical methods of dental plaque removal have existed for centuries. Nearly a century ago, the ADA recommended the mechanical oral care regimen of twice daily toothbrushing and daily interdental cleaning (for example, flossing).¹ To this day, this regimen is regarded widely as being a highly effective

Mechanical methods of oral hygiene can be complemented by the use of chemotherapeutic mouthrinses.

means of helping control dental caries and periodontal disease, both of which are plaque-mediated conditions and rank among the most common diseases in humans.² For a variety of reasons, however, this mechanical routine does not appear to be enough for the majority of people, as supported by incidence and prevalence data. For example, gingivitis was present in 63 percent of the adult U.S. population sampled in the Third National Health and Nutrition Examination Survey.³

About three decades ago, researchers suggested that adding chemotherapeutic agents to the mechanical regimen may help control plaque and gingivitis, the earliest

Background. Mechanical methods of oral hygiene can be complemented by the use of chemotherapeutic mouthrinses. The authors sought to quantify the additional benefit provided by an essential oil-, or EO-, containing mouthrinse in reducing plaque and gingivitis in patients who brush and floss regularly.

Methods. The authors randomly assigned patients with gingivitis to one of three treatment groups: brushing and rinsing with a control mouthrinse, or BC; brushing, flossing and rinsing with a control mouthrinse, or BFC; or brushing, flossing and rinsing with an EO-containing mouthrinse, or BFEO. Patients received a dental prophylaxis at baseline, and the authors followed them for six months.

Results. Of 246 enrolled subjects enrolled in the study, 237 subjects were evaluable at the study's conclusion. After six months, the subjects using the BFEO regimen had statistically and clinically significant lower mean Modified Gingival Index, or MGI, scores and Plaque Index, or PI, scores than did subjects in the BC group (29.9 percent and 56.3 percent, respectively; $P < .001$). Subjects in the BFC group had statistically significantly lower mean MGI and PI scores than did subjects in the BC group (11.2 percent and 9.3 percent, respectively; $P < .001$). Subjects in the BFEO group exhibited statistically and clinically significantly lower mean scores for MGI and PI than did subjects in the BFC group (21 percent and 51.9 percent, respectively; $P < .001$).

Conclusions. This study confirms that for patients with gingivitis who brush and floss routinely, the adjunctive use of an EO-containing mouthrinse provides a clinically significant and meaningful additional benefit in reducing plaque and gingivitis.

Clinical Implications. An EO-containing mouthrinse is an effective adjunct to regular brushing and flossing. Therefore, the BFEO regimen can be beneficial for patients with gingival inflammation.

form of periodontal disease.^{4,5} Only two mouthrinse formulations—an essential oil-, or EO-, containing mouthrinse and a .12 percent chlorhexidine mouthrinse—have been awarded the ADA's Council on Scientific Affairs Seal of Acceptance as adjuncts for the prevention and reduction of gingivitis and plaque.⁶ Listerine Antiseptic Mouthrinse (Pfizer, Morris Plains, N.J.), available as an over-the-counter product, and Peridex (Zila Pharmaceuticals, Phoenix), available by prescription only, are the only mouthrinses that have fulfilled the ADA Acceptance program criteria, including being clinically proven to provide an average reduction in gingivitis of at least 20 percent in two randomized, controlled, six-month studies. We are unaware of any private-label EO-containing mouthrinses that have demonstrated clinical efficacy.

A number of long-term studies (that is, six months or longer) of several flavors of Listerine fulfill the ADA's criteria and have demonstrated the adjunctive benefit of Listerine in a usual home care routine.⁷⁻¹² In other words, these studies were designed specifically to allow the subjects to continue with their existing mechanical regimen, which may have included flossing. Two more long-term studies were conducted recently to establish a benchmark of rinsing to flossing.^{13,14} Both studies demonstrated that twice daily use of Listerine is at least as good as daily flossing in reducing gingival inflammation in interproximal areas. These studies were comparative by design and never were intended to suggest that rinsing with Listerine is a viable alternative to flossing. Instead, we suggest that chemotherapeutic mouthrinses are an effective complement to mechanical oral care practices.

As a means of building on this body of evidence, we sought to determine the incremental benefit of the adjunctive use of an EO-containing antiseptic mouthrinse (Cool Mint Listerine Antiseptic, Pfizer) to routine brushing and flossing in inhibiting whole-mouth plaque and gingivitis.

MATERIALS AND METHODS

We designed a randomized, controlled, observer-blind, parallel-group, six-month clinical trial. The design, execution and analysis of this study were in accordance with ADA Acceptance Program

Guidelines on Chemotherapeutic Products for Control of Gingivitis⁶ and standard operating procedures for Pfizer, which comply with International Conference on Harmonisation Good Clinical Practice guidelines.¹⁵ This international standard for pharmaceutical clinical trials ensures credible and accurate data and results management.

Our clinical protocol, including informed consent, was reviewed and approved by the BioSci Research Canada (Mississauga, Ontario) institutional review board. All subjects read and signed informed consent forms before the start of the study.

We enrolled 246 healthy subjects with mild-to-moderate gingivitis. All subjects were required to have a mean Modified Gingival Index,¹⁶ or MGI, score of ≥ 1.75 and mean plaque index, or PI, score of ≥ 1.95 at baseline to qualify for the study.

Before the baseline examination, the subjects refrained from conducting oral hygiene for at least eight hours, but no more than 18 hours. The oral examination included hard- and soft-tissue assessment and scoring of clinical indexes. We assessed gingivitis

using the MGI on all scorable teeth at four areas, the buccal and lingual marginal gingivae and the interdental papillae, as

- 0 = normal (absence of inflammation);
- 1 = mild inflammation (slight change in color, little change in texture) of any portion of the gingival area;
- 2 = mild inflammation of the entire gingival area;
- 3 = moderate inflammation (moderate glazing, redness, edema and/or hypertrophy) of the gingival area;
- 4 = severe inflammation (marked redness and edema/hypertrophy, spontaneous bleeding or ulceration) of the gingival area.

We assessed bleeding according to the gingival bleeding index,¹⁷ or BI, by inserting a periodontal probe into the gingival crevice and sweeping from the distal aspect to the mesial aspect around the tooth at a depth of approximately 1 millimeter and at an angle of approximately 60 degrees while in contact with the sulcular epithelium. We assessed each of four gingival areas—distobuccal, midbuccal, mesiolingual and midlingual—around

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Before the baseline examination, the subjects refrained from conducting oral hygiene for at least eight hours, but no more than 18 hours.

each tooth in this manner and waited approximately 30 seconds before recording the number of gingival areas that bled, using the following scale: absence of bleeding after 30 seconds (0); bleeding observed after 30 seconds (1); immediate bleeding observed (2).

After using a disclosing solution on the teeth, we scored the plaque area using the Turesky modification of the Quigley-Hein Plaque Index¹⁸ on six surfaces of all scorable teeth as follows: no plaque (0); separate flecks or discontinuous band of plaque at the gingival (cervical) margin (1); thin (up to 1 mm), continuous band of plaque at the gingival margin (2); band of plaque wider than 1 mm but less than one-third of surface (3); plaque covering one-third or more, but less than two-thirds, of surface (4); plaque covering two-thirds or more of surface (5).

After the baseline examinations, we randomly assigned subjects to one of three groups. Each subject then received a complete dental prophylaxis to remove plaque, stain and calculus, which was confirmed by the use of disclosing solution. The brushing and rinsing with a control mouthrinse, or BC, group served as the negative control group. This group was instructed to brush twice daily with an ADA-Accepted toothbrush (Oral-B 35, Gillette, Boston) and dentifrice (Colgate MFP, Colgate-Palmolive, New York), as well as to rinse twice daily with a 5 percent hydroalcohol control mouthrinse. The control mouthrinse was necessary to account for any potential benefit derived from the mechanical action of rinsing itself. We gave the brushing, flossing and rinsing with a control mouthrinse, or BFC, group the same instructions as the BC group, and we instructed them to floss (Reach Waxed Dental Floss, Johnson & Johnson, Skillman, N.J.) once daily. We instructed the brushing, flossing and rinsing with an EO-containing mouthrinse, or BFEO, group to brush and floss as the subjects in the BFC group, but to rinse with Cool Mint Listerine Antiseptic.

A dental hygienist gave flossing demonstrations and provided written instructions to subjects in the two flossing groups. We did not supervise daily oral hygiene procedures, with the exception of the initial visit. However, we required subjects to demonstrate the proper

flossing technique before participating in the unsupervised portion of the study. We instructed all subjects to brush thoroughly twice daily and gave them toothbrushes and dentifrice as needed. We told all subjects to rinse twice daily for 30 seconds with 20 milliliters of their assigned rinse, and we provided 1-ounce plastic dosage cups with the 20-mL level marked. We instructed subjects to separate the two daily rinses by at least four hours. We allowed the subjects to follow their usual dietary habits, but we instructed them to refrain from using any oral care products other than what we provided to them for the study. We permitted limited interdental cleaning in all groups in instances of considerable food entrapment. We asked subjects to record rinsing and flossing use in diaries provided by BioSci Research Canada (the test site) staff members.

Subjects returned to the test site at monthly intervals for compliance evaluations, to have their test materials replenished and for adverse event monitoring. We reviewed their diaries to determine compliance, and we weighed their floss and mouthrinse containers to help us determine usage.

A trained and calibrated dental examiner (N.S.) performed all of the study examinations. To minimize bias, the examiner did not have access to any case report forms until the examinations were completed. In addition, he did not know which of the regimens had been followed. The subject, the examiner and the recorder did not have access to the treatment code. Before the three- and six-month examinations, subjects refrained from using all test products for at least four hours before the examination. To minimize potential bias, study personnel at the test site who dispensed the test products or supervised their use did not participate in the examination of subjects.

Statistical methods and data management. We determined that a total sample size of 228 evaluable subjects (76 per treatment group) was necessary to detect the effectiveness of treatment differences between groups. This was based on the estimate of standard deviation from one of our previous studies.¹³ This sample size provided at least 90 percent power to detect a difference of 0.085 for MGI and 0.36 for PI, assuming a standard deviation of 0.160 for MGI and 0.367 for

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The control mouthrinse was necessary to account for any potential benefit derived from the mechanical action of rinsing itself.

PI. We used SAS Version 6.12 (SAS Institute, Cary, N.C.) to perform our statistical analyses.

We performed analyses for all randomized subjects and for evaluable subjects. We defined evaluable subjects as all randomized subjects with no major protocol violations.

The primary efficacy variables were whole-mouth mean MGI and mean PI scores. The secondary efficacy variables were whole-mouth mean BI scores and interproximal mean MGI, PI and BI scores. We conducted the primary examination at six months postbaseline and the secondary examination at three months postbaseline.

We compared the treatment groups with respect to age and baseline efficacy variables using a one-way analysis of variance model with treatment as a factor. We used a χ^2 test to compare the groups with respect to sex and smoking status, and we used a Fisher exact test for race.

For the primary and secondary efficacy variables, we tested the differences between treatments at three and six months by a one-way analysis of covariance model with treatment as a factor and the corresponding baseline value as a covariate. We tested the treatment-by-baseline interactions at the .05 level of significance to assess heterogeneity of slopes. We compared the BFEO group to the BC and BFC groups and the BFC group to the BC group. We tested all comparisons at the .05 level of significance, two-sided.

RESULTS

To ensure against any potential bias, we determined the evaluability of all subjects before breaking any blinded codes. We provide the results from only evaluable subjects' analyses, since the respective randomized subject analyses essentially were identical. We excluded subjects from evaluation for administrative reasons (that is, dropout or poor compliance), concomitant antibiotic use or other significant medical findings.

We enrolled 246 subjects in the study and randomly assigned them to one of the three groups. We considered 241 subjects to be evaluable at either three or six months (81 subjects in the BC group, 81 subjects in the BFC group and 79 subjects in the BFEO group). We considered 237 subjects to be evaluable at both three months and six

months postbaseline.

We found no significant differences related to demographic and baseline efficacy variables between treatment groups (sex, $P = .102$; all other values, $P \geq .603$). Subjects ranged in age from 18 to 64 years, with a mean age of 37 years. Most were women (67.2 percent), nonsmokers (85.9 percent) and white (71.8 percent).

Primary efficacy variables. Table 1 and Figure 1 present whole-mouth mean MGI scores, one of the two primary measurements. We noted statistically significant reductions in whole-mouth mean MGI scores in both the BFC and BFEO groups when we compared them with the BC group at three and six months. We found similar results for the BFEO group scores when compared with the BFC group.

Compared with the BC group in terms of percentage reduction, we saw a 6.4 percent additional improvement in whole-mouth mean MGI scores in the BFC group at three months and an 11.2 percent additional improvement at six months. Compared with the BC group in terms of percentage reduction, we saw a 10.4 percent additional improvement in whole-mouth mean MGI scores in the BFEO group at three months and a 29.9 percent additional improvement at six months. The comparison in which we were most interested was the percentage reduction in the BFEO group when compared with the BFC group. At three months, we saw an additional improvement of whole-mouth mean MGI scores of 4.2 percent. At six months, we saw an additional improvement of 21.0 percent. All these results were statistically significant ($P < .001$). Applying the criteria described in the ADA Guidelines⁶ to a comparison of the six-month results between the BFEO and BFC groups suggested a clinically significant reduction in gingivitis as a result of adding an EO-containing mouthrinse to the brushing and flossing routine.

Table 2 and Figure 2 (page 501) present whole-mouth mean PI scores, the second primary measurement. We saw statistically significant reductions in whole-mouth mean PI scores in both the BFC and BFEO groups when we compared them with the BC group at three and six months. We saw similar results for the BFEO group when compared with the BFC group.

A regimen of twice-daily brushing and once-daily interdental cleaning undoubtedly has contributed to better oral health in patients.

TABLE 1

WHOLE-MOUTH MEAN MODIFIED GINGIVAL INDEX SCORES AT BASELINE, THREE MONTHS AND SIX MONTHS.

MEASUREMENT INTERVAL	BC* GROUP	BFC† GROUP		BFEO‡ GROUP		
	Mean (± SD) [§]	Mean (± SD)	% Reduction Versus BC [¶]	Mean(± SD)	% Reduction Versus BC [¶]	% Reduction Versus BFC [¶]
Baseline	2.11 (0.09)	2.10 (0.08)	NA [#]	2.11 (0.11)	NA	NA
Three Months	2.06 (0.10)	1.93 (0.11)**	6.4	1.85 (0.11)** ††	10.4	4.2
Six Months	2.04 (0.17)	1.81 (0.21)**	11.2	1.44(0.28)** ††	29.9	21.0

* BC: Brushing and rinsing with a control mouthrinse.
 † BFC: Brushing, flossing and rinsing with a control mouthrinse.
 ‡ BFEO: Brushing, flossing and rinsing with an essential oil-containing mouthrinse.
 § SD: Standard deviation.
 ¶ Based on adjusted mean score.
 # NA: Not applicable.
 ** Statistically significantly different from BC group, *P* < .001.
 †† Statistically significantly different from BFC group, *P* < .001.

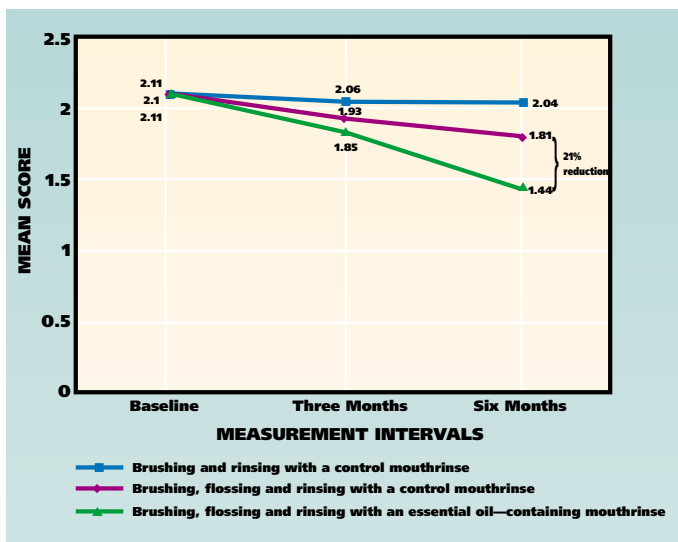


Figure 1. Whole-mouth mean modified gingival index scores.

Compared with the BC group in terms of percentage reduction, we saw a 3.6 percent additional reduction in whole-mouth mean PI scores in the BFC group at three months and a 9.3 percent additional reduction at six months. Compared with the BC group in terms of percentage reduction, we saw a 37.5 percent additional reduction in whole-mouth mean PI score in the BFEO group at three months and 56.3 percent additional reduction at six months. Of most interest among the plaque reduction comparisons between groups was that between the BFEO group and the BFC group. At three months, whole-mouth plaque reduction was 35.2 percent,

and at six months it was 51.9 percent. All of these results were statistically significant (*P* < .001), except for the comparison of BFC and BC groups at three months (*P* < .05).

Secondary efficacy variables. Table 3 (page 502) shows the results of the secondary efficacy variables, interproximal adjusted mean MGI and PI scores. At six months, the BFEO group had statistically significantly lower interproximal mean MGI scores than the BFC group.

Bleeding is another valuable criterion for evaluating gingival health. The results of whole-mouth mean BI scores and interproximal mean BI scores for the groups are presented in Table 4 (page 502). There were statistically significant differences between all groups at three and six months. However, due to the low levels of bleeding at all times, we chose not to analyze for percentage differences and 95 percent confidence intervals for percentage differences.

Safety. The adverse event rates were similar among the groups (30.5 percent, 29.3 percent and 28 percent for the BFEO, BFC and BC groups, respectively). We judged none of these events to be serious. All but one adverse event was considered unlikely to be related to the study drug by the investigator. We considered one adverse event in the negative control group to have a probable relationship to the treatment.

DISCUSSION

The routine of twice daily brushing and once daily interdental cleaning has been the mainstay of oral hygiene recommendations by dental profes-

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TABLE 2

MEASUREMENT INTERVAL	BC* GROUP	BFC† GROUP		BFEO‡ GROUP		
	Mean (± SD§)	Mean (± SD)	% Reduction Versus BC¶	Mean (± SD)	% Reduction Versus BC¶	% Reduction Versus BFC¶
Baseline	2.77 (0.27)	2.78 (0.30)	NA#	2.75 (0.34)	NA	NA
Three Months	2.66 (0.27)	2.57 (0.24)**	3.6	1.65 (0.51)††‡‡	37.5	35.2
Six Months	2.61 (0.27)	2.37 (0.38)††	9.3	1.13 (0.60)††‡‡	56.3	51.9

* BC: Brushing and rinsing with a control mouthrinse.
 † BFC: Brushing, flossing and rinsing with a control mouthrinse.
 ‡ BFEO: Brushing, flossing and rinsing with an essential oil-containing mouthrinse.
 § SD: Standard deviation.
 ¶ Based on adjusted mean score.
 # NA: Not applicable.
 ** Statistically significantly different from BC group, *P* < .05.
 †† Statistically significantly different from BC group, *P* < .001.
 ††‡‡ Statistically significantly different from BFC group, *P* < .001.

sionals to their patients for decades.^{1,19} While long-term studies supporting this routine are relatively few in number,²⁰⁻²² this regimen undoubtedly has contributed to better oral health in patients. When we consider contemporary incidence and prevalence of periodontal diseases,^{2,3} however, it is apparent that adjunctive methods of plaque and gingivitis control could be helpful for most patients.

Health care professionals' recommendations of any therapy should be based on clinically relevant scientific evidence. This approach is the central tenet of evidence-based care in our profession and in that of others.²³ A number of published clinical studies⁷⁻¹⁴ with similar, but not identical, designs supports the recommendation of the adjunctive use of antiseptic mouthrinses. The study variations include, but are not limited to, the degree of supervision and mechanical methods used. Most studies of all flavors of Listerine permitted patients to continue their existing oral care regimens, which may have included daily interdental cleaning. We designed our study to quantify specifically the expected incremental benefit derived from the adjunctive use of all flavors of Listerine in patients who brush and floss as recommended. That is, in this long-term, six-month study conducted in accordance with ADA Acceptance Program Guidelines, we sought to determine if brushing, flossing and rinsing with a mouthrinse routine was more effective than a brushing and flossing routine in helping reduce plaque and gingivitis.

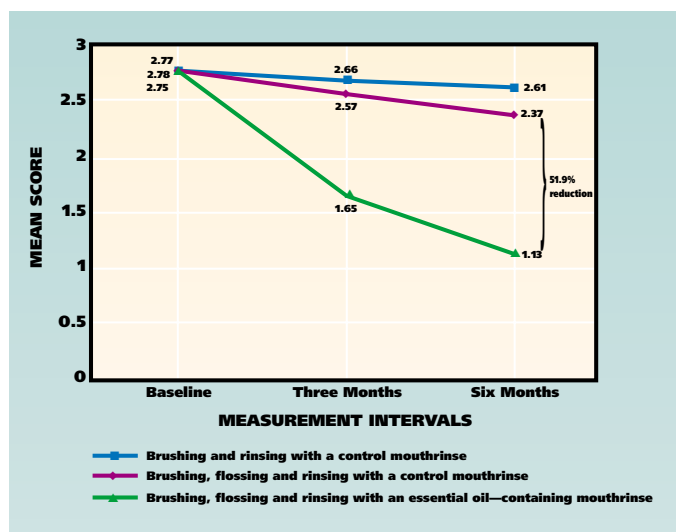


Figure 2. Whole-mouth mean plaque index scores.

The results of our study provide substantial evidence that the adjunctive use of Cool Mint Listerine Antiseptic provides a clinically significant and meaningful benefit in patients with gingival inflammation. This was apparent from the 21 percent incremental reduction in gingivitis in patients who brush and floss regularly as a result of rinsing with Cool Mint Listerine Antiseptic. Furthermore, rinsing with the EO-containing mouthrinse provided an additional reduction in interproximal gingivitis of 15.8 percent when added to the brushing and flossing routine. In comparison, the addition of flossing to a brushing routine contributed a 7.7 percent reduction in

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TABLE 3

INTERPROXIMAL MEAN MODIFIED GINGIVAL INDEX AND PLAQUE INDEX SCORES AT BASELINE, THREE MONTHS AND SIX MONTHS.

INDEX AND MEASUREMENT INTERVAL	BC* GROUP		BFC† GROUP		BFEO‡ GROUP	
		Mean (± SD)§	Mean (± SD) % Reduction	Versus BC¶ Mean (± SD)	% Reduction Versus BC¶	% Reduction Versus BFC¶
Interproximal Mean Modified Gingival Index						
Baseline	2.21 (0.17)	2.20 (0.16)	NA#	2.22 (0.19)	NA	NA
Three Months	2.17 (0.15)	2.06 (0.09)**	4.9	2.04 (0.07)**	6.1	1.3
Six Months	2.17 (0.21)	2.00 (0.18)**	7.7	1.69 (0.34)** ††	22.3	15.8
Interproximal Mean Plaque Index						
Baseline	2.83 (0.27)	2.83 (0.30)	NA	2.80 (0.33)	NA	NA
Three Months	2.75 (0.28)	2.65 (0.24)‡‡	3.7	1.77 (0.52)** ††	35.0	32.5
Six Months	2.69 (0.28)	2.45 (0.36)**	8.9	1.26 (0.60)** ††	52.4	47.7

* BC: Brushing and rinsing with a control mouthrinse.
 † BFC: Brushing, flossing and rinsing with a control mouthrinse.
 ‡ BFEO: Brushing, flossing and rinsing with an essential oil-containing mouthrinse.
 § SD: Standard deviation.
 ¶ Based on adjusted mean score.
 # NA: Not applicable.
 ** Statistically significantly different from BC group, *P* < .001.
 †† Statistically significantly different from BFC group, *P* < .001.
 ‡‡ Statistically significantly different from BC group, *P* < .05.

TABLE 4

WHOLE-MOUTH AND INTERPROXIMAL MEAN BLEEDING INDEX SCORES AT BASELINE, THREE MONTHS AND SIX MONTHS.

MEASUREMENT INTERVAL	BC* GROUP		BFC† GROUP		BFEO‡ GROUP	
	Mean (± SD)§		Mean (± SD)		Mean (± SD)	
	Whole-Mouth	Interproximal	Whole-Mouth	Interproximal	Whole-Mouth	Interproximal
Baseline	0.16 (0.09)	0.15 (0.11)	0.15 (0.09)	0.14(0.08)	0.16 (0.12)	0.15 (0.12)
Three Months	0.17 (0.07)	0.16 (0.08)	0.07 (0.05)¶	0.07 (0.05)¶	0.05 (0.05)¶#	0.06 (0.06)¶#
Six Months	0.16 (0.08)	0.15 (0.08)	0.05 (0.04)¶	0.06 (0.05)¶	0.02 (0.04)¶**	0.03 (0.05)¶**

* BC: Brushing and rinsing with a control mouthrinse.
 † BFC: Brushing, flossing and rinsing with a control mouthrinse.
 ‡ BFEO: Brushing, flossing and rinsing with an essential oil-containing mouthrinse.
 § SD: Standard deviation.
 ¶ Statistically significantly different from BC group, *P* < .001.
 # Statistically significantly different from BFC group, *P* < .05.
 ** Statistically significantly different from BFC group, *P* < .001.

interproximal gingivitis. These findings led us to ask why the use of the EO-containing mouthrinse provided the greater incremental benefit. Our attempt to explain this is based on the fact that

flossing adds a greater mechanical disruption of the interproximal dental plaque biofilm than does brushing alone, with the clinical outcome being a greater reduction in plaque and gingivitis. While

the effect of mechanical disruption is substantial, it appears to have a limited effect and may be difficult to achieve for many patients. However, considering the evidence that EO's penetrate dental plaque biofilm,²⁴ this mechanical/chemotherapeutic combination seemed to provide a synergistic effect rather than one that is additive.

We suggest that this is the supragingival analogue to the therapeutic combination of scaling and root planing plus antibiotics, whether they are delivered systemically or locally. In other words, mechanical therapy is performed first to disrupt the biofilm and to decrease the total microbial load. This allows for a more effective penetration of the plaque biofilm by the chemotherapeutic agent, thus enhancing its activity. This is the rationale for the use of antibiotics in periodontal therapy and is consistent with good medical practice for treatment of bacterial infections.²⁵

We do not suggest that rinsing with an EO-containing mouthrinse is a convenient substitution for daily flossing or other interdental cleaning methods. As demonstrated in this study and others,^{13,14,26} flossing helps reduce plaque and gingivitis. It also removes trapped food debris and, perhaps most importantly, helps prevent interproximal caries by clearing contact areas.²⁷ Mechanical methods of plaque removal are critical for the maintenance of gingival health. However, we suggest that for most patients the addition of a chemotherapeutic mouthrinse that is clinically proven to be effective provides a significant benefit to their gingival health.

CONCLUSION

This long-term study demonstrates that the adjunctive use of an EO-containing mouthrinse twice daily provides a meaningful and clinically significant incremental benefit to a recommended regimen of brushing twice daily and flossing once daily. Dental professionals should consider recommending a brush, floss and rinse regimen to their patients when brushing and flossing are not enough to maintain gingival health. ■

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