



Eastman Department
of Dentistry



Eastman Dental Center



Center for Oral Biology

#1065 **Effect of an Essential Oil Herbal Mouthwash on Oral Malodor**

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ABSTRACT

The purpose of this study was to examine a mouthwash containing essential oils and herbal extracts, effect on whole mouth and posterior dorsum tongue malodor over a 6-hour period. Thirty healthy adults were randomly assigned to three groups: an essential oil/herbal extract mouth rinse (Tooth & Gums Tonic – Dental Herb Company, TGT); a placebo containing mainly water (PL); and 0.12% chlorhexidine (CHX). At base line, 30' and every hour thereafter for 6 hours an organoleptic evaluation was performed of both whole mouth and tongue malodor using a scale from 0 to 5. In addition the mouth air was evaluated with a Halimeter and OralChroma gas chromatography to measure the volatile sulfide compounds. The mean organoleptic scores for TGT, PL and CHX groups at baseline were 2.65, 2.46 and 2.61 for whole mouth and 2.90, 2.68 and 2.67 for tongue malodor, respectively. Both the whole mouth and tongue malodor decreased significantly after a single rinse with TGT and the effect remained at the end of the 6 hour study. The organoleptic scores for whole mouth and tongue malodor at 30', 1, 2, 3, 4, 5, and 6 hours are: 0.40 and 0.45, 0.61 and 0.83, 0.70 and 0.75, 1.05 and 1.30, 1.20 and 1.20, 1.65 and 1.70, and 1.85 and 1.80, respectively. TGT is superior to both PL and CHX in reducing whole mouth and tongue malodor up to 4(whole mouth) to 5(tongue) hours after a single rinse ($p < 0.05$). There were no statistically significant differences in the concentration of volatile sulphur compound between the groups in the 6 hour period. The essential oil/herbal extract rinse was significantly more effective than chlorhexidine and placebo in reducing malodor after a single rinse. The short term impact of the rinses on oral malodor is most likely a masking effect

INTRODUCTION

Bad breath is a common problem affecting 50% of the adult population (Bosy, 1997). Patients suffering from halitosis frequently use mouth rinses as a treatment. The efficacy of the commercially available mouth rinses are commonly short-lived, provide little antiseptic function and only mask the odors (13). Previous research has shown that a 2-phase oil:water formulation containing CPC (Cetylpyridinium chloride) as an active ingredient can efficiently bind and reduce number of oral microorganisms (14). This mouthrinse has been shown to reduce oral malodor 8 hours after rinsing as compared to a placebo (water) and positive control (0.2% chlorhexidine gluconate) (15). Rosenberg and coworkers showed that that a 0.2% chlorhexidine (CHX) mouthwash regimen produced a 43% reduction in peak VSC values, and lowered organoleptic mouth odour ratings by 50% (Rosenberg et al. 1991). A study by *De Boever * Loesch (1995)* found that a 1-week rinsing regimen with 0.12% CHX gluconate in combination with a mechanical approach significantly reduced VSC levels (as measured with halimeter) and mouth and tongue odour by 73.3%, 68.6% and 77.8%, respectively. The in vivo antimicrobial effects of essential oil mouthwashes have been demonstrated. In a study of odour-producing crevicular flora, 30 healthy adults with no obvious oral pathology were randomized to a supervised, single 30-s rinse with an EO mouthwash (Listerine[®], Pfizer Consumer Healthcare, Morris Plains, NJ, USA), placebo rinse (a hydroalcohol vehicle) or a control rinse (plain distilled water) (Pitts et al. 1983).

The EO mouthwash significantly depressed crevicular odourgenic microorganisms at all post-treatment sampling times, and was highly effective in depressing all determinants of oral malodour (Pitts et al. 1983). Previous research has shown that a 2-phase oil water formulation efficiently bind to and reduce number of oral micro organism as well as reduce malodor.

OBJECTIVE

To evaluate an essential oil and herbal extract containing mouthwash effect on oral malodor in comparison to Chlorhexidine gluconate and water (Placebo) over a 6 hour period.

METHODS

Thirty medically healthy patients over 18 years of age were recruited for this 6 hour study. The subjects were randomly assigned to three groups. Group A rinsed with water (Placebo) ; Group B rinsed with an essential oil and herbal extract mouth rinse(Test group) and Group C with chlorhexidine gluconate 0.12% .). At baseline, a medical history, dental history, and a bad breath questionnaire was completed by one of the investigators. Thereafter an intra and extra-oral examination was performed by one operator including plaque index according to Löe and Sillness(11), gingival index according to Löe and Sillness (12), bleeding index , depth of periodontal pockets measured with a Michigan O probe (HuFriedy, Chicago, Illinois), visual and tactile caries exam and soft tissue examination. This baseline evaluation included measurement of volatile sulphur compound (VSC) using a halimeter, Oral Chroma (Abilit –Japan), and the the organoleptic measurements of whole mouth and tongue were performed by two odor judges. Subjects with gingival and plaque indices ≥ 1 and organoleptic score of 2 or more (slight but clearly noticeable) were offered to enroll in the study.

After completing the baseline measurements the patients rinsed with 10 cc of test solution (B-EO) and 15cc of placebo (A-PL) and chlorhexidine(C-CHX). At base line, 30 minutes and every hour thereafter an organoleptic evaluation by two calibrated examiners was performed of both whole mouth and tongue malodor using a scale from 0 (no appreciable malodor) and 5 (extremely foul malodor). In addition the VSC of the mouth air was evaluated with a Halimeter and Oral Chroma gaschromatography .

RESULTS

The essential oil and herbal extract rinse baseline value as measured organicoleptically was 2,65 for whole mouth malodor and 2, 9 for tongue. At thirty minutes whole moth malodor was 0,400 and tongue malodor 0,450. At one hour the values were 0.611 and 0,833 respectively and at two hours these values 0,700 and 0,750. The malodor was significantly more reduced in the essential oil and herbal extract group compared to chlorhexidine and water groups for upto 4 hours($p < 0,05$) in whole mouth air and upto 5 hours for tongue malodor ($p < 0,05$). No statistically significance could be shown between the groups with the Halimeter and Oral Chroma .

Baseline data

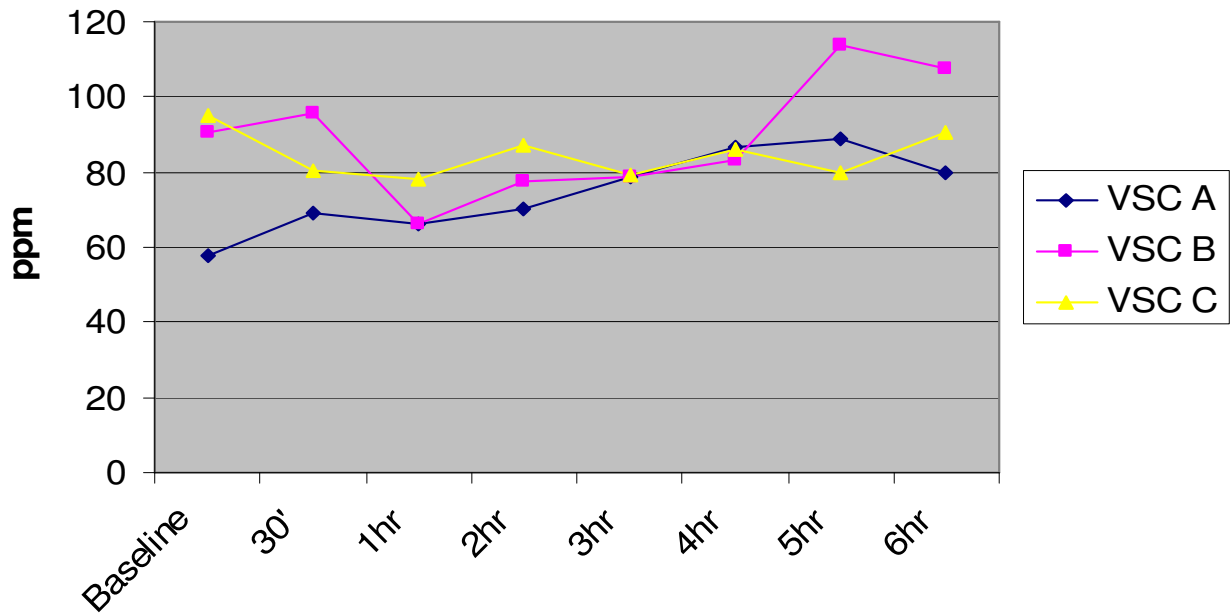
		A	B	C	p*
Sex	Male	1	4	3	
	Female	9	6	7	0.3033
Age	Mean (SD)	38.6 (13.2)	38.0 (12.9)	38.4 (11.9)	0.9942
PI	Mean (SD)	2.41 (0.35)	1.79 (0.50)	1.82 (0.41)	0.0040
GI	Mean (SD)	1.26 (0.34)	1.13 (0.26)	1.05 (0.09)	0.1851
PD	Mean (SD)	2.51 (0.12)	2.56 (0.22)	2.65 (0.22)	0.2981
VSC-H	Mean (SD)	57.9 (11.8)	90.5 (47.5)	95.1 (29.6)	0.0358
VSC-OC	Mean (SD)	248.4 (365.6)	450.6 (444.1)	289.2 (295.5)	0.4511
Mouth odor	Mean (SD)	2.40 (0.39)	2.65 (0.47)	2.65 (0.47)	0.3699
Tongue odor	Mean (SD)	2.65 (0.41)	2.90 (0.52)	2.70 (0.82)	0.6292

*ANOVA, two tailed test

VSC measured by Halimeter

	Baseline	30'	1hr	2hr	3hr	4hr	5hr	6hr
VSC A	57.90	68.90	66.20	70.00	78.90	86.60	88.60	79.90
VSC B	90.50	95.80	66.20	77.40	78.90	83.20	113.50	107.70
VSC C	95.10	80.40	78.00	86.90	79.50	86.20	79.70	90.60

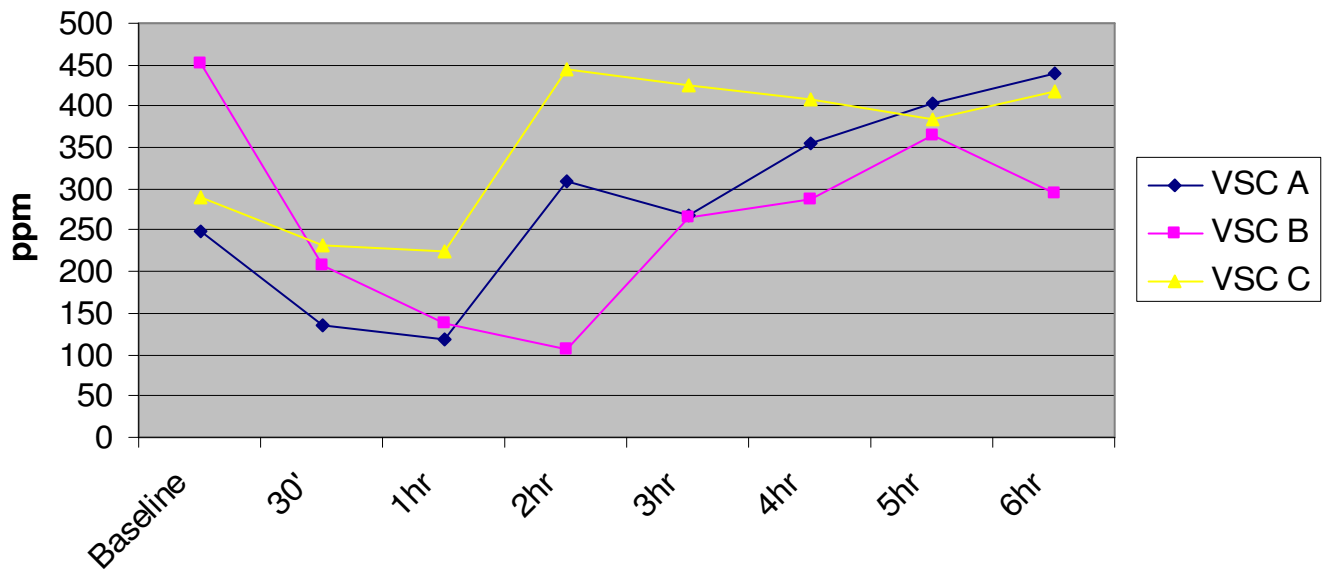
VSC by Halimeter



VSC measured by OralChroma

	Baseline	30'	1hr	2hr	3hr	4hr	5hr	6hr
VSC A	248.4	136.1	118.8	308.4	269.0	355.3	403.3	440.8
VSC B	450.6	208.1	137.0	106.4	264.7	288.3	365.0	293.8
VSC C	289.2	231.1	224.7	445.5	426.1	408.3	383.0	416.7

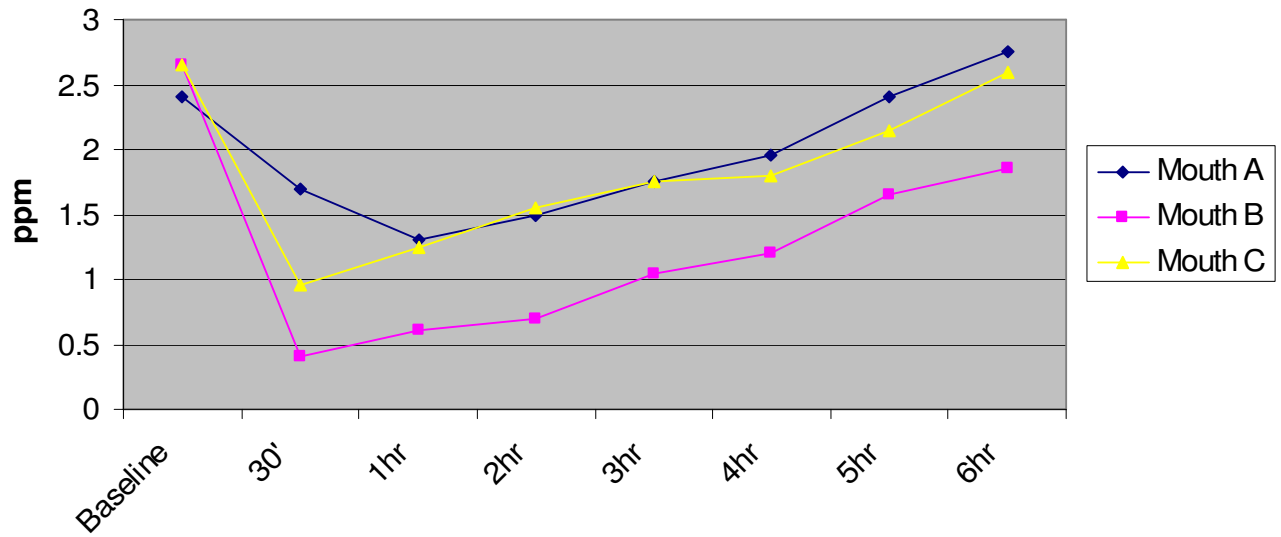
VSC by OralChroma



Whole Mouth Odor

	Baseline	30'	1hr	2hr	3hr	4hr	5hr	6hr
Mouth A	2.40	1.70	1.30	1.50	1.75	1.95	2.40	2.75
Mouth B	2.65	0.40	0.61	0.70	1.05	1.20	1.65	1.85
Mouth C	2.65	0.95	1.25	1.55	1.75	1.80	2.15	2.60

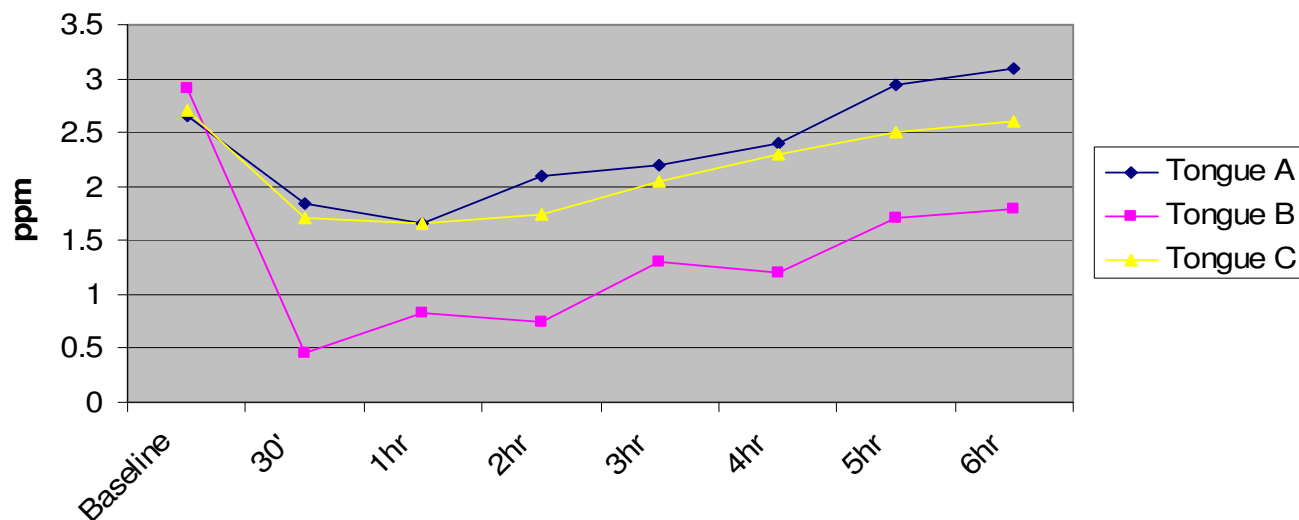
Mouth Odor



Tongue Odor

	Baseline	30'	1hr	2hr	3hr	4hr	5hr	6hr
Tongue A	2.65	1.85	1.65	2.10	2.20	2.40	2.95	3.10
Tongue B	2.90	0.45	0.83	0.75	1.30	1.20	1.70	1.80
Tongue C	2.70	1.70	1.65	1.75	2.05	2.30	2.50	2.60

Tongue Odor



CONCLUSIONS

The results of this study indicate that the essential oil and herbal extract rinse reduced the mouth malodor significantly more and longer compared to chlorhexidine gluconate and water when assessed organoleptically. The effect on oral and tongue malodor could last at least 5 hours after a single rinse with the essential oil and herbal extract.

ACKNOWLEDGEMENT

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