

ORIGINAL RESEARCH

Evaluating the comparative effects of Listerine zero and Persica mouthwashes on the periodontal conditions of fixed orthodontics patients

Asal Omidsalar¹, Shahin Emami Meibodi², Ferena Sayar³, Ahmad SheibaniNia^{4*}

1. General Dentist, Private Practice
2. Associate Professor, Department of Orthodontic, Islamic Azad University, Dental School, Tehran Branch, Tehran, Iran
3. Associate Professor, Department of Periodontics, Faculty of Dentistry, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran
4. Associate Professor, Fellowship of Orthosurgery, Department of Orthodontic, Islamic Azad University, Dental School, Tehran Branch, Tehran, Iran

*Corresponding Author:

Address: Department of Orthodontic, Islamic Azad University, Dental School, Tehran Branch, Tehran, Iran.

Email: asheibaninia@yahoo.com

ORCID: 0000-0002-9699-960X

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Abstract

Background and Objective: Periodontal problems are very common among patients undergoing fixed orthodontics treatment. Using mouthwashes such as Listerine and Persica is recommended in order to prevent such complications. There have, however, been no information on the comparative effects of Listerine and Persica mouthwashes so far. Thus the comparative study presented here under the title of “Evaluating the comparative effects of Listerine Zero and Persica Mouthwashes on the Periodontal Conditions of fixed orthodontics Patients was conducted at the Department of Dentistry of Azad University of Tehran.

Materials and Methods: A blind randomized clinical trial was conducted on 30 patients. All subjects were between 20 and 50 years of age; had been under fixed orthodontic treatment for at least two months; did not have serious systemic health complications; had a minimum of 5 teeth in each quadrant for evaluation. Root planning and scaling were conducted on male and female subjects prior to their entry into the study. The SI, GI, PI, and BOP indices of each subject were then recorded in the base-line stage. The subjects were then divided into two random groups. The first group was treated with Persica (Pursina Co., Iran) and the second group with Listerine Zero (Johnson & Johnson, New Jersey, USA). The two groups were followed up twice after two and four weeks of treatment and their SI, GI, PI, and BOP indices were recorded.

Results: The SI, GI, PI, and BOP indices were found to have changed by similar amounts in both groups ($P < 0.12$). The changes in GI, PI, and BOP were, however, statistically significant within each group ($P < 0.02$). The changes in SI index within the Persica group were found to increase only within the first two weeks of treatment ($P < 0.05$).

Conclusion: Following the comparative study described above, both mouthwashes appear to positively affect the periodontal condition of fixed orthodontics patients. Both mouthwashes were, however, found to have similar effects.

Keywords: Listerine, Persica, Periodontal diseases, Fixed orthodontics

Introduction

Oral hygiene is one of the concerns in treatment of fixed orthodontic patients. Fixed appliances prevent mechanical brushing (1) and cause gingivitis in these patients. Gingivitis is very common in orthodontic patients (2). Presence of bands, brackets and related components such as restoration, composite resin and cement used to bond brackets create biofilms in the mouth and prevent biofilm cleaning by the patient and prevent dental demineralization and gingivitis (3, 4). Following that changes the amount and type of oral microbe (2, 5). Many studies have linked the increase in biofilm and indicates orthodontic fixation devices (1, 6). The primary cause of gingivitis is inadequate removal of the supra-gingival plaque. The presence of orthodontic fixed appliance provides the basis for plaque accumulation on the buccal surface of the tooth and around the brackets. Patients specifically Children and Teenagers do not use dental floss because the presence of orthodontic wires is time-consuming and frustrating (7). Dr. Joseph Lester showed that the use of carboxylic acid in surgical suturing was significantly infectious after surgery. Surgery reduces Lester's work inspired by American Joseph Lawrence to produce a Septic note with alcohol base that includes Akalyptol, menthol, methyl salicylate and thymol in honor of Joseph Lister, who called it Listerine. Listerine compounds have antiseptic effects and some believe that the presence of methyl salicylate may have an anti-inflammatory effect (8). There is concern about increased risk of oral cancer using alcoholic mouthwashes such as Listerine (9). ADA in March 2009 Stated that the evidence did not confirm the link between oral cancer and mouthwash (10). Johnson & Johnson Company produced a non-alcoholic sample of Listerine Zero (11), a non-alcoholic mouthwash that we investigated in this study. Its effect is compared with Listerine, Persica, a plant originating from *Salvadora Persica*. Toothbrush or plant that dates back to the Middle East nations 1400 years ago (12). Toothbrush chewing has been done by many nations around the world to clean teeth for centuries and still exists in many areas despite Modern brushing techniques are used (12) Even some researchers have claimed that those who use Miswak mouthwash 5 times a day

have less caries than those who use a regular toothbrush (10). Elvin-Lewis have done a lot of researches on this material and found that Miswak is a vasoconstrictor and therefore reduces gingivitis. They conclude that the people who use this plant to clean their mouth lose less of their teeth. High amounts of chloride in the plant prevent the formation of thiocyanate by reducing the mass and dyeing of the thiocyanate (13) and in contact with free cyanide saliva. Which prevents the growth of oral bacteria. Fluoride is another component of the Miswak plant that can affect the glycosine enzymes of the bacteria and their acid production and production of intercellular polysaccharides (10) in research done by Rotimi and Mosadomi, reducing caries, periodontal disease, gingival bleeding and Plaque in the use of toothbrushes reported (14). In this study, microbial plaque control was investigated by two Listerine and Persica mouthwashes and their potency in this regard. Therefore, we aimed to investigate the comparative clinical efficacy of two oral mouthwashes through periodontal parameters such as PI, GI, BOP and SI indices in patients undergoing fixed orthodontic treatment referring to the Specialty Department of Orthodontics and Periodontology and Private Clinic during the year of 2016.

Materials and Methods

The research method was clinical trial. Patients with age range of 20 to 50-year-old undergoing fixed orthodontic treatment referring to the Specialty Department of Orthodontics and Periodontology and Private Clinic were selected. According to similar studies, 30 patients were divided randomly into two groups of 15-case, over a period of three to four weeks (12, 15, 16).

Patients eligible for fixed orthodontic treatment:

- Their ages are between 20 to 50-year-old
- Have at least two months of orthodontic treatment
- Systemically healthy and do not take any particular medication and are not pregnant
- Do not require tooth extraction during research
- Do not smoke
- Have at least 5 teeth in each quadrant for evaluation
- Absence of periodontal pocket deeper than 2

mm

- Have mild gingivitis condition
- Probing depth not more than 3mm and no attachment loss
- Have an acceptable cooperation
- Do not have bridges and oral ulcers
- Do not have debonding of the brackets
- The bonded material should be light cured
- Do not have severe dental caries

The active ingredients of Listerine include menthol 0.042% and thymol 0.064% and methyl salicylate 0.06% and eucalyptol 0.092%.

PI Index (Plaque Index): Measured using the Agent Disclosure Solution based on the Orthodontic plaque index (17).

SI Index (Stain Index): Measured by observation on the basis of the Lobene index, (18).

BOP (Bleeding On Probing) Index: Measured by Williams probe averages based on Aniamo & Bay index (19).

GI (Gingival Index): Measured using the agent disclosure solution based on Loe & Silness index (20).

Interventional variables: Patient cooperation, drug use, patient's oral hygiene status and dental caries, systemic patient status, patient's mouthwash use during the past months, number of braces, number of healthy teeth per quadrant, Tooth decay, Oral lesions, Gingival consistency and color, periodontic envelope, Attachment Loss, Duration of orthodontic treatment, Need for tooth extraction during investigation, Bracket status, Bond type, Band used for gluing brackets, smoking, pregnancy
 How to deal with variables: The age range of the study was considered to be between 20 and 50 years, regarding the status of blessings at the beginning of the study and selection of eligible individuals while questioning the orthodontist and observing the records of patients whose treatment was initiated. Appropriate, the type of bonding material used to bond the brackets was light cure and the need for teeth extraction was not investigated for the duration of the study. Regarding the extent of the patient's cooperation, they were selected from the records and their regular referrals. They took medication, had systemic illness, had dental caries or lost teeth. They had decayed teeth, had used mouthwash in the past month, had crown and bridges, smoked,

were pregnant, had lesions and oral ulcers, had periodontal pocket, were excluded from the study then all participants They were prophylaxis and under the same health education provided by the project manager. After approval of the proposal in the Faculty Research Council 30 Eligible patients referred to the orthodontic department of Islamic Azad Dental School and private clinic are selected for scaling and root planning and hygiene education before entering the study. To be taught. All SI-GI-GBI -PI indices are first recorded in the base line in data Form 1 (before mouthwash). We then divide the patients into two groups randomly assigned to one group of Persica mouthwash and one group of non-alcoholic Listerine. After 4 weeks, the indices are reviewed again and recorded in data form 2 to study the longer-term effect of mouthwash and similar articles (16, 21).

Indicators are re-measured for the second follow-up period 2 weeks later and recorded in data Form 3, then, statistical analysis of Repeated measure Anova and mann-u-witney was used for statistical analysis of variables of PI-GI-SI and BOP.

Results

This research was undertaken on 30 patients who were divided into two groups of 15-case. The subjects were similar in terms of gender, age and the presence of teeth in each arch.

Table 1: Distribution of the studied subjects by characteristics and type of mouthwash

Characteristics	Sex		Age	Number of Teeth		
	Female	Female		6	7	8
Type of Mouthwash						
Listerine Zero N1=15	11(73.3)	11(73.3)	20.6±8.3	1(6.6)	4(26.7)	10(66.7)
Persica N2=15	9(60)	9(60)	26.7±5.4	1(6.6)	7(46.7)	7(46.7)
P Value	P<0.44	P<0.44	P<0.5	P<0.51		

Also, the two groups were similar in terms of time of study and socioeconomic status of those attending university or private practice.
BOP Index: The amount of BOP in terms of the time taken by the study group is shown in Table 2, showing that:
 - Initially, the study was 16.3 in the Listerine group and 17.2 in the Persica group, which were similar (P <0.87).
 - The second follow-up was also similar P <0.9.
 - The magnitude of the BOP changes in both Listeria and Persica was statistically significant.

Table 2: BOP rates by follow-up by treatment groups.

Characteristics	Pre intervention	First Follow up	Second Follow up	P value Time	P value Between time and type of mouthwash
Type of Mouthwash					
Listerine Zero N1=15	16.3 ±10.8	9.3 ±6.9	2.8 ±3.9	0.001	0.874
Persica N2=15	17.2 ±11.8	8.4 ±7	4.5 ±7.5		
P Value	0.87	0.567	0.902		

GI Index: The GI values by time of follow-up and by the associated factors are presented in Table 3, which indicates that the baseline values were similar in the first and second follow-up groups and their difference was not statistically significant $P < 0.9$. The decrease in GI in each mouthwash was significant at follow-up time $P < 0.01$

Table 3 GI levels by time of follow-up by treatment group.

Characteristics	Pre intervention	First Follow up	Second Follow up	P value Time	P value Between time and type of mouthwash
Type of Mouthwash					
Listerine Zero N1=15	1.67 ±0.49	1.56 ±0.53	1.40 ±0.43	0.001	0.246
Persica N2=15	1.83 ±0.39	1.61 ±0.43	1.41 ±0.34		
P Value	0.286	0.902	0.713		

PI Index: The PI value according to the time of follow-up by type of mouthwash is presented in Table 4 and shows that at follow-up the PI was similar in the two groups at $P < 0.2$ but its decrease in both mouthwashes was statistically significant. $P < 0.3$.

Table 4: PI rates by different follow-up time and treatment groups.

Characteristics	Pre intervention	First Follow up	Second Follow up	P value time.	P value Between time and type of mouthwash
Type of Mouthwash					
Listerine Zero N1=15	57.4 ±18.4	54.7 ±18.6	55.2 ±16.9	0.025	0.98
Persica N2=15	65.6 ±23	63.1 ±22.6	63.5 ±23.6		
P Value	0.081	0.126	0.074		

SI Index: There was no significant difference in SI between the two mouthwashes ($P < 0.9$) but showed no change in Listerine group $P < 0.6$ but in Persica group there was a significant difference between pre-intervention and first follow-up $P < 0.01$ but in first follow-up. And second there was no significant difference $P < 0.09$.

Table 5 SI rates by different follow-up time and treatment groups.

Characteristics	Pre intervention	First Follow up	Second Follow up	P value Time	P value Between time and type of mouthwash
Type of Mouthwash					
Listerine Zero N1=15	10.8 ±21	11.3 ±21.1	55.2 ±16.9	0.098	0.029
Persica N2=15	4.1 ±7.4	9 ±11.8	63.5 ±23.6		
P Value	0.237	0.87	0.074		

Discussion

The results showed that the effect of two mouthwashes on Persica and Listerine Zero was similar in terms of BOP, GI, SI and PI indices and each mouthwash had a positive

effect on their changes. Intervention and the first follow-up period were significant but not significant between the first and second follow-up periods.

As IT has been stated in this issue, no research investigating the comparative effect of the two mouthwashes on periodontal status has been reported or available for interpretation. In year 2015, a study was conducted by Dr. Farhadian and colleagues using the effect of electric toothbrush to evaluate the effect of Persica and Chlorhexidine mouthwashes on reducing gingival swelling in orthodontic patients by randomized clinical trial. Patients with fixed orthodontic appliances and at least two orthodontic patients were randomly divided into four equal groups. Periodontal indices of BOP, GI, PI, HI were studied. Significant improvement in indices was observed in all groups. Results except for HI were observed. The study was consistent with our findings about persica (22). In Year 2014, a study by Dr. HAAS and PANNUTI and colleagues at the University of Sao Paulo entitled "Rinses for the Control of Gingival Biofilms and Gingivitis in Orthodontic Patients". This study was Evidence-based in this study - one study on the effects of chlorhexidine and three studies on the effects of daily use of antiseptics that showed that chlorhexidine had better results in reducing plaque and gingivitis but due to the unintended effects of continued use in Long-term use is not recommended for oily compounds studied and there is no credible evidence to show the effect of antiseptics other than chlorhexidine and essential oils (such as Listerine) on orthodontic patients. The study showed that in patients undergoing orthodontic treatment, hexidine chlorine was used to treat severe gingivitis, whereas essential oils (eg, Listerine, for long-term daily use, to control the gingival plaque). The findings of this study were consistent with our findings on Listerine mouthwash(23). Dr. Alhabashneh and Dr. Qubain and colleagues conducted another study in 2014 at the Jordan University of Science and Technology, in the same study, to investigate the effects of Listerine mouthwash on plaque and its effects on serum c-reactive protein levels in patients aged between 2 years. They were studied for 5 years and were evaluated for CI, BOP, SI, PI, SBI and CI indices(21). In year 2007 a study by Dr. Tufekcia and Casagranale et al. at the

University of Virginia, the effect of essential oil mouthwashes (such as Listerine) on orthodontic patients' oral hygiene was investigated. The purpose of this study was to investigate the effect of adding Listerine to the health diet. Oral standard has no benefit in maintaining oral health of orthodontic patients. In this study, 4 patients were evaluated for MGI, PI, BOP, and MGI indices and the study concluded that the ineffectiveness of Listerine was rejected and use Listerine has a significant effect on the plaque and gum health of patients. The results of this study were also consistent with our findings on Listerine mouthwash, although this was done over a period of 3 months longer than ours (24). One of the disadvantages of the study was that we followed the patients for 4 weeks. Maybe the follow-up would change more. Some of the factors affecting the periodontal status of the patients, such as dietary pattern and immune system and smoking ... This study may be effective. Periodontal Cal Index might have been better. The positive aspects of this research are that we do not have the Bias

model, and we no longer looked at two societies with poorer economic status, as well as clients in the private practice that enhance the value of work. But the question is why the two mouthwashes had the same effect and did not differ between the two groups. This has a variety of causes, including that both herbal mouthwashes have relatively identical effective ingredients, such as terpenes, vitamin C and so on.

In conclusion, both seem to be effective but not significantly different. Due to the lower price of Persica the use of Persica is more affordable.

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Conflict of interest

Author declares no conflict of interest.

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