

EFFECTIVENESS OF MYRRH EXTRACT MOUTH RINSE ON THE GINGIVAL HEALTH OF ORTHODONTIC PATIENTS- A PROSPECTIVE,DOUBLE BLINDED, RANDOMIZED CLINICAL TRIAL.

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INTRODUCTION

Various dentifrices and mouth rinses are available in the market, which are used for maintaining oral hygiene. Chemicals such as triclosan and chlorhexidine are an important component in dentifrices and mouth rinses, which helps in preventing plaque and gingivitis. However, some of these chemicals cause alterations in taste sensation and cause tooth staining. This has given scope for research on the formulation of many natural, nonchemical, and herbal dentifrices. The following research deals with the use of Myrrh mouth rinse on the gingival health of orthodontic patients. The presence of brackets, bands and other accessories, as well as composite resin restorations and cements used to bond them, facilitate biofilm build up and hinder its removal by patients, favoring enamel demineralization and gingivitis, 10, 11 and promoting quantitative and qualitative changes in the oral microbiota. 19, 22 Several studies have shown an association between placement of braces and an increase in biofilm. 13, 14 Corroborating the damage done by orthodontic appliances to the periodontium, Sallum et al. 15 observed significant reductions in plaque, gingivitis, probing pocket depth and the presence of periodonto-pathogenic microorganisms after 30 days of appliance removal and professional prophylaxis. Local biofilm retention factors may aggravate home oral hygiene quality. For this reason,

patients wearing fixed orthodontic appliances comprise a group that may benefit from the daily use of mouthwashes. studies show that proper mechanical control is not performed effectively by the majority of the population, mainly due to lack of motivation and of manual dexterity. 5, 6 These findings are supported by several epidemiological studies that reported a high prevalence of gingivitis and poor oral hygiene in both developed 7, 8 and developing countries. Hence the current study is being undertaken to evaluate the effectiveness of Myrrh extract mouthrinse on the gingival health of patients undergoing orthodontic therapy in a prospective pattern using double blinded randomized clinical trial method.

AIMS AND OBJECTIVE:

To evaluate the effectiveness of Myrrh mouth rinse on the gingival health of patients undergoing orthodontic treatment.

Effectiveness of Myrrh mouth rinse on the gingival health of orthodontic patients during the course of treatment in comparison to chlorhexidine mouthwash.

- Effectiveness of Myrrh mouth rinse on the gingival health of orthodontic patients during the first, second and third month of orthodontic treatment.

MATERIALS :

Myrrh mouth rinse in 1:1 concentration

- Chlorhexidine mouthwash
- Cotton rolls for isolation during the calculation of gingival index
- William's periodontal probe.
- Shepherd's hook explorer
- Disclosing solution.

METHOD

In this prospective, double blinded randomized clinical trial, 40 patients aged between 12 and 25 years undergoing orthodontic treatment were selected.

The GINGIVAL INDEX BY LOE AND SILNESS 1963, ORAL HYGIENE INDEX SIMPLIFIED, PLAQUE INDEX BY LOE AND SULCUS BLEEDING INDEX BY MUHLEMANN AND SONS 1963 were recorded for all the patients involved in the study before orthodontic treatment and during the first, second and third month follow up visits.

STATISTICAL ANALYSIS

Statistical analysis of the data was done using IBM SPSS Statistics version 26 software package (SPSS). Descriptive statistics including mean and standard deviation were calculated for various indices at baseline, 1 month, 2 months and 3 months. Normality of the data was assessed using Shapiro-Wilk test, which revealed that the data significantly deviated from normal distribution. Therefore, further analysis was done using non-parametric tests. Friedman's two-way Analysis of variance by ranks was used to compare the statistical significance of groups at various time intervals followed by pairwise comparison with Bonferroni correction. The level of significance in the present study was kept at p less than 0.05

REVIEW OF LITERATURE

Huser et al.¹² conducted a split-mouth study, which evaluated the clinical and microbiological effects of installing orthodontic bands in 10 patients. They evaluated four sites per patient; two of them comprised the test (banded teeth) and the other two comprised the control (unbanded teeth) groups. The parameters were assessed at baseline, 5, 7, 47, 72 and

90 days after placement of orthodontic appliances. The results showed increases in plaque, gingival inflammation and spirochetes, and decreases in cocci levels in test sites compared to control sites, while probing depth remained unchanged for both groups. Arranjo et al.¹⁴ evaluated the clinical and microbiological changes in 30 patients before and 3 months after orthodontic bracket placement (test), and 30 patients without braces (control). The results showed that probing depth and clinical attachment level remained unchanged after 3 months, but there was an increase in the amount of plaque and in the clinical signs of gingival inflammation, in addition to an increase in superinfecting microorganisms and periodontal pathogens (*Porphyromonas gingivalis*, *Prevotella intermedia* / *Prevotella nigrescens*, *Tannerella forsythia*, and *Fusobacterium* species). Alves et al.⁴ conducted a randomized clinical trial with 30 subjects between 12 and 21 years of age who used fixed orthodontic appliances. The results are in agreement with the Tufekci et al.¹² study, and provide further evidence about the additional benefit of daily use of mouthrinses containing essential oils in reducing plaque and gingivitis. However, these authors did not provide descriptive data to compare results.

RESULTS

The distribution of the gingival index scores for both the myrrh mouth rinse group and the chlorhexidine group was the same at baseline, at first, second and third month review.

However, within the myrrh mouth rinse group, there was statistically significant difference in the gingival index score from baseline to first, second and third month follow up scores.

Similarly, statistically significant difference was seen in the oral hygiene index simplified score group within the myrrh group from baseline to third month and second month follow up scores.

In the chlorhexidine mouthwash group, significant difference in the oral hygiene status was seen from baseline to third month follow up visit scores.

No significant difference was noted otherwise and in between other groups.

In the pairwise comparison for plaque index within the two study groups, statistically significant results

were seen from base line to third month follow up visits and also within the first and third month visit scores within the myrrh mouth rinse group.

Appreciable difference in the plaque index was noted between the second and third month in the chlorhexidine group.

DISCUSSION:

Several chemical preventive agents have beneficial effects in the control of plaque and to reduce or prevent oral disease. Hence, various chemical formulations were tried in dentifrices. Chemicals mainly triclosan and chlorhexidine have been added in the mouth rinses and dentifrices to prevent plaque and gingivitis.

However, some of these substances show undesirable adverse effects such as tooth staining and altered taste. This had led to paying increased attention on using natural ingredients in herbal dentifrices.

Hence, the aim of the study was to evaluate the effectiveness of echinacea mouth rinse on the gingival health of orthodontic patients.

Chlorhexidine was developed in 1950 remains to be the gold standard anti-plaque agent till date due to its properties such as substantivity and anti-plaque efficacy.¹³ However, many studies report that long-term use of chlorhexidine is associated with brownish discoloration of teeth and tongue, altered taste sensation, and oral desquamation in children.¹⁴ The anti-plaque efficacy of chlorhexidine was attributed to the retention of this compound in the oral cavity and its slow release.¹⁵

Although the plaque regrowth potential and gingival inflammation were significantly reduced in chlorhexidine compared to echinacea mouth rinse in the initial one month of usage, the latter mouth rinse did not exhibit other side effects. In recent times, the use of herbal or plant extract based mouthwashes is on the rise. This is because of its reduced or no effects and its natural origin and also economical when compared to chlorhexidine. Chlorhexidine is the most thoroughly studied antiplaque substance,^{9,4} and it has good plaque -inhibiting properties with an immediate antibacterial effect and a prolonged effect on the oral flora.

A long-term clinical study also confirmed the good safety profile of chlorhexidine formulations¹⁸ However, reversible local side effects such as staining of teeth, impaired sense of taste, increased formation of supragingival calculus, and occasionally mucous membrane irritation and desquamation are associated with prolonged use of chlorhexidine mouthwash.⁴²

To a varying degree, these factors might adversely affect patient compliance, particularly when

chlorhexidine is used as a mouthwash in addition to a patient's normal daily oral hygiene.

This double-blind clinical trial demonstrated that, up to 3 months, the 0.50% and 0.75% chlorhexidine dentifrices significantly reduced gingivitis and bleeding in orthodontic patients compared with a dentifrice without chlorhexidine; this agreed with other.

Fourrier believes that the use of antibacterial materials can reduce the number of pathogenic bacteria in the oral cavity and the inheritance into the trachea. Thus, use of disinfectants reduces the rate of hospital-acquired pneumonia three times. Therefore, employing different approaches to reduction of bacterial pollution in oral cavity of the patients was associated with a reduction of nosocomial infection.⁷ Maozhen believes that the lungs and lower airways are sterile and microbes may enter the lower airways through inhalation, but respiratory tract infection occurs most importantly through aspiration of oropharyngeal secretions.

As the oral flora of the patients in the intervention and control groups were same at baseline, the significant difference between the microbial loads of these two groups after the intervention can show that echinacea was more effective in disinfecting and reducing Discussion 33 microorganisms of oropharyngeal region. Although echinacea decreased the number of microorganisms, more studies are needed to determine its effect on the microorganisms.

CONCLUSION

Based on the findings of this study, Myrrh mouth rinse can be used as a suitable mouthrinse with minor complications. Further studies on the subject are recommended.

Control of plaque is very essential for the prevention of any inflammatory condition to progress into a chronic periodontal condition. Mouthwashes prevent plaque control with regular use and in maintaining the health of the periodontium specially during fixed orthodontic therapy. This study revealed that the efficacy of Myrrh mouthrinse almost equates to that of the "gold standard" chlorhexidine.. However, more studies have to be performed to prove that herbal mouthwashes can equate the "gold standard" chlorhexidine mouthwash

The study was limited to two factors.

- A trial period of longer duration would have provided results that are more meaningful and accurate.
- Measures to validate and reduce the host

response to oral health could have been made standard.

Nevertheless, within the limitation of the study, echinacea mouth rinse showed definitive reduction in plaque and helped maintain oral hygiene in patients undergoing orthodontic treatment. Looking ahead, studies are needed to endorse such mouth rinse as substitutes for synthetic mouthwashes. Further, research to establish plaque control and antimicrobial efficacy are necessary before these new mouth rinse can included with other agents for daily use.

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