

Comparative Evaluation of Effect of Two Different Antiplaque Agents on Patients Undergoing Fixed Orthodontic Treatment

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ABSTRACT

Background: Orthodontic treatment can be an uncomfortable experience. Two to three weeks after plaque accumulation, white spot lesions appear on the buccogingival areas and may lead to patient dissatisfaction at the end of orthodontic treatment. Hence; the present study was undertaken for comparing the effect of two different antiplaque agents on patients undergoing fixed orthodontic treatment.

Materials & methods: A total of 20 patients scheduled to undergo fixed orthodontic treatment were enrolled in the present study. All the patients were broadly divided into two study groups, with ten patients in each group. In one group, Chlorhexidine gel was used (CLX Group), and in another group, metronidazole gel was used (MTZ Group). Mean probing depth and mean gingival index was assessed in both the study groups at the initial time, six weeks during treatment and 12 weeks during treatment. All the results were recorded in Microsoft excel and were analyzed by SPSS software.

Results: Mean probing depth among subjects of CLX group at baseline, six weeks, and 12 weeks was found to be 4.3, 2.2 and 2.1 respectively. Mean probing depth among subjects of CLX group at baseline, six weeks and 12 weeks was found to be 4.4, 2.3 and 2.0 respectively. While comparing mean probing depth in between the two study groups at different time intervals, non-significant results were obtained. Also, while comparing the mean gingival index between the two study groups, non-significant results were obtained.

Conclusion: Both chlorhexidine gel and metronidazole gel can be used with equal effectiveness in patients undergoing orthodontic treatment.

Keywords: Antiplaque, Orthodontic treatment.

INTRODUCTION

Orthodontic treatment can be an uncomfortable experience. Orthodontic appliances are foreign objects inserted into a sensitive area of the body, causing both physical and psychological discomfort. Such discomfort can exert a negative influence on the patient's desire to undergo treatment,

cooperation and quality of treatment itself. According to the acidogenic theory, the development of demineralization areas results from the increase in Streptococcus mutans (S. mutans), Streptococcus sobrius, lactobacilli, and actinomyces bacteria, which

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produce acid around the braces as they metabolize sugar.¹⁻³

Two to three weeks after plaque accumulation, white spot lesions appear on the buccogingival areas and may lead to patient dissatisfaction at the end of orthodontic treatment. If these lesions progress to decay, cosmetic or extensive dental interventions are needed. Some precautions can be taken to decrease the risk of demineralization and to strengthen the enamel structure. A common strategy to improve mechanical plaque removal is to incorporate a chemotherapeutic agent, such as an antibacterial mouthrinse, into the oral hygiene regimen.⁴⁻⁶ Hence; the present study was undertaken for comparing the effect of two different antiplaque agents on patients undergoing fixed orthodontic treatment.

MATERIALS & METHODS

The present study was undertaken for comparing the effect of two different antiplaque agents on patients undergoing fixed orthodontic treatment. Ethical approval was obtained from the institutional ethical committee, and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 20 patients scheduled to undergo fixed orthodontic treatment were enrolled in the present study. All the patients were broadly divided into two study groups, with ten patients in each group. In one group, Chlorhexidine gel was used (CLX Group), and in another group, metronidazole gel was used (MTZ Group). Mean probing depth and mean gingival index was assessed in both the study groups at the initial time, six weeks during treatment and 12 weeks during treatment. All the results were recorded in Microsoft excel and were analyzed by SPSS software.

RESULTS

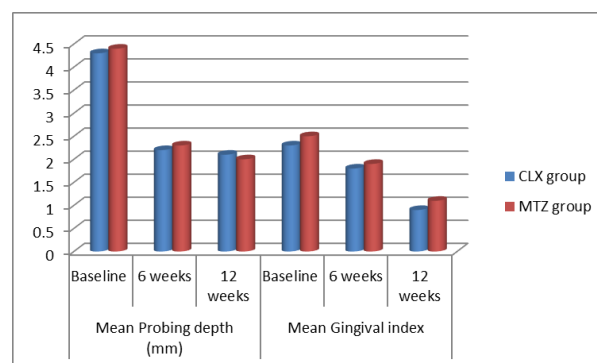
A total of 20 patients scheduled to undergo fixed orthodontic treatment were enrolled in the present study. All the patients were broadly divided into two study groups, with ten patients in each group. In one group, Chlorhexidine gel was used (CLX Group), and in another group, metronidazole gel was used (MTZ Group). Mean probing depth among subjects of CLX group at baseline, six weeks and 12 weeks was found to be 4.3, 2.2 and 2.1 respectively. Mean probing depth among subjects of CLX group at

baseline, six weeks and 12 weeks was found to be 4.4, 2.3 and 2.0 respectively. While comparing mean probing depth in between the two study groups at different time intervals, non-significant results were obtained. Also, while comparing the mean gingival index between the two study groups, non-significant results were obtained.

Table 1: Comparison of mean probing depth and mean gingival index

Variable		CLX group	MTZ group	p-value
Mean Probing depth (mm)	Baseline	4.3	4.4	0.23
	6 weeks	2.2	2.3	0.15
	12 weeks	2.1	2.0	0.88
Mean Gingival index	Baseline	2.3	2.5	0.13
	6 weeks	1.8	1.9	0.38
	12 weeks	0.9	1.1	0.82

Graph 1: Mean probing depth and mean gingival index



DISCUSSION

It is accepted that comprehensive orthodontic treatment is lengthy; the time frame is largely dictated by the biologic principles underpinning optimal tooth movement. There has been a lack of clarity concerning the typical duration of treatment. In a previous review that included observational studies, the authors were unable to arrive at an overall estimate of treatment duration. In spite of this lack of a clear yardstick, there has been a seemingly relentless drive among orthodontists and general dentists to reduce the duration of orthodontic treatment. Modern adjuncts directed at

hastening treatment include newer technologies and novel surgical procedures, but some clinicians also resort to eschewing integral treatment phases in an effort to reduce treatment times. The main factors associated with the discomfort experienced by orthodontic patients are: The type of appliance, amount of force applied in the early stages of treatment, previous experiences with pain and emotional, cognitive and environmental aspects such as culture, sex and age.⁵⁻⁹ Hence; the present study was undertaken for comparing the effect of two different antiplaque agents on patients undergoing fixed orthodontic treatment. A total of 20 patients scheduled to undergo fixed orthodontic treatment were enrolled in the present study. All the patients were broadly divided into two study groups, with ten patients in each group. In one group, Chlorhexidine gel was used (CLX Group), and in another group, metronidazole gel was used (MTZ Group). Mean probing depth among subjects of CLX group at baseline, six weeks and 12 weeks was found to be 4.3, 2.2 and 2.1 respectively. Mean probing depth among subjects of CLX group at baseline, six weeks and 12 weeks was found to be 4.4, 2.3 and 2.0 respectively. Niazi FH et al. compared the antiplaque effects of two herbal types of mouthwash containing *Salvadorapersica* and *Azadirachta indica*, respectively, with two synthetic types of mouthwash containing either chlorhexidine or cetylpyridinium. One hundred patients undergoing orthodontic treatment underwent scaling and polishing at baseline to obtain a plaque score of zero. In the first phase, they were given oral hygiene instructions and were provided with a standard toothpaste to be used twice daily for a period of three weeks. In the second phase, following scaling and polishing, they were randomly allocated to 4 groups according to 4 different types of mouthwash (A: chlorhexidine; B = cetylpyridinium; C = extracts of *Salvadorapersicamiswak*; D: extract of *Azadirachta indicamiswak*) along with previously taught toothbrushing protocol for three more weeks. Plaque accumulation was scored three times according to the Modified Bonded Bracket Plaque Index: at the start, after the toothbrush-toothpaste trial, and at the end of mouthwash trial. Eighty participants completed the study - 63 females and 17 males. There was a statistically significant decrease in mean plaque scores after using mouthwashes in all four groups at follow-up when

compared to the baseline plaque score ($p = 0.001$). The greatest reduction of plaque score was found in group C (extract of *Salvadorapersica*) when compared with group A, chlorhexidine ($p = 0.016$). Compared to other mouthwashes, *Salvadorapersicamiswak*-based mouthwash showed a maximum reduction in the plaque scores among orthodontic patients.¹⁰ In the present study, while comparing mean probing depth in between the two study groups at different time intervals, non-significant results were obtained. Also, while comparing the mean gingival index between the two study groups, non-significant results were obtained. Sharma R et al. evaluated the effectiveness of a manual orthodontic toothbrush, a powered toothbrush with oscillating head and sonic toothbrush in controlling plaque, gingivitis and interdental bleeding in patients undergoing fixed orthodontic treatment, and to compare their relative efficacy. Sixty subjects, who were to receive orthodontic treatment with both upper and lower fixed appliances, were randomly divided into three study groups, with 20 patients in each group. Groups I to III were given manual orthodontic, powered and sonic toothbrushes, respectively. Plaque index (PI), gingival index (GI) and interdental bleeding index were scored to assess the level of plaque accumulation, gingival health and interdental bleeding at baseline; 4 and 8 weeks recall visits after fixed appliance bonding. This study showed that a significant reduction in all the three indices scores was found from baseline to 4 and 8 weeks in group III. On intergroup comparison, no statistically significant differences were detected between the three groups for any of the parameters assessed. On intragroup comparison, sonic brushes performed superiorly in reducing gingivitis, plaque and interdental bleeding as compared to the manual orthodontic and powered brushes. On intergroup comparison, the relative comparative effectiveness was found to be similar for all the three brushes.¹¹

CONCLUSION

Both chlorhexidine gel and metronidazole gel can be used with equal effectiveness in patients undergoing orthodontic treatment.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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