International Journal of Research in Health and Allied Sciences

Journal home page: www.ijrhas.com

Official Publication of "Society for Scientific Research and Studies" [Regd.]

ISSN: 2455-7803

Original Research

Comparative evaluation of effect of two different antiplaque agents on patients undergoing fixed orthodontic treatment

[1]Dr. Harsharanjeet Kaur, [2]Dr. Shobhna, [3]Dr. Ayushi Jindal, [4]Dr. Sanjeev Soni

[1]Reader, Maharaja Ganga Singh Dental College, Sri Ganganagar, Rajasthan, India;
[2]MDS, Orthodontist, India;
[3]Senior Lecturer, Department of Pedodontics and Preventive Dentistry, Desh Bhagat Dental College and Hospital, Mandi Gobindgarh, Punjab, India;
[4]MDS Orthodontics, India

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 10 patients in each group. In one group, Chlorhexidine gel was used (CLX Group) and in other group, metronidazole gel was used (MTZ Group). Mean probing depth and mean gingival index was assessed in both the study groups at initial time, 6 weeks during treatment and 12 weeks during treatment. All the results were recorded in Microsoft excel and were analysed by SPSS software. **Results:** Mean probing depth among subjects of CLX group at baseline, 6 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, 6 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 in 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.
Key words: Antiplaque, Orthodontic treatment

Received Date: 23 March, 2024 Acceptance Date: 26 April, 2024

Corresponding author: Dr. Harsharanjeet Kaur, Reader, Maharaja Ganga Singh Dental College, Sri Ganganagar, Rajasthan, India

This article may be cited as: Kaur H, Shobhna, Jindal A, Soni S. Comparative evaluation of effect of two different antiplaque agents on patients undergoing fixed orthodontic treatment. Int J Res Health Allied Sci 2024; 10(3):9-12.

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 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 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 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 10 patients in each group. In one group, Chlorhexidine gel was used (CLX Group) and in other group, metronidazole gel was used (MTZ Group). Mean probing depth and mean gingival index was assessed in both the study groups at initial time, 6 weeks during treatment and 12 weeks during treatment. All the results were recorded in Microsoft excel and were analysed by SPSS software.

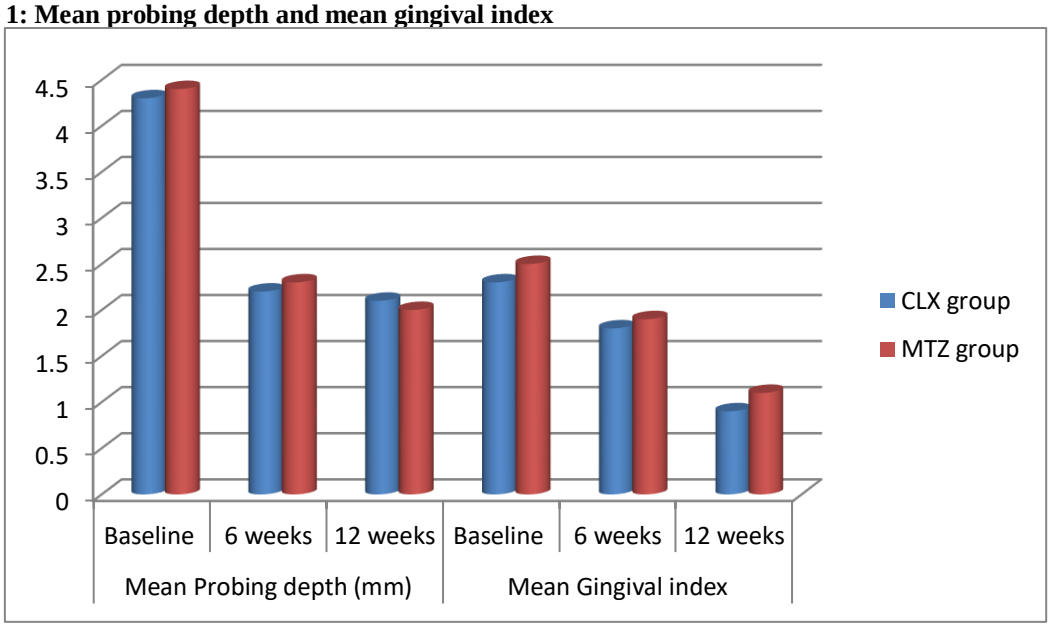
RESULTS

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 10 patients in each group. In one group, Chlorhexidine gel was used (CLX Group) and in other group, metronidazole gel was used (MTZ Group). Mean probing depth among subjects of CLX group at baseline, 6 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, 6 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 in 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 10 patients in each group. In one group, Chlorhexidine gel was used (CLX Group) and in other group, metronidazole gel was used (MTZ Group). Mean probing depth among subjects of CLX group at baseline, 6 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, 6 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 mouthwashes containing Salvadora persica and Azadirachta indica, respectively, with two synthetic mouthwashes containing either chlorhexidine or cetylpyridinium. 100 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 Salvadora persica miswak; D: extract of Azadirachta indica miswak) 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 Salvadora persica) when compared with group A, chlorhexidine ($p = 0.016$). Compared to other mouthwashes, Salvadora persica miswak-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 in between the two study groups, non-significant results were obtained. Sharma R et al evaluated the effectiveness of a manual orthodontic toothbrush, 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.

REFERENCES

1. Albino JE, Lawrence SD, Tedesco LA. Psychological and social effects of orthodontic treatment. J Behav Med. 1994;17(1):81–98.
2. Oliver RG, Knapman YM. Attitudes to orthodontic treatment. Br J Orthod. 1985;12(4):179–188.
3. Ngan P, Kess B, Wilson S. Perception of discomfort by patients undergoing orthodontic treatment. Am J Orthod Dentofacial Orthop. 1989;96(1):47–53.
4. Marques LS, Pordeus IA, Ramos-Jorge ML, Filogônio CA, Filogônio CB, Pereira LJ, et al. Factors associated with the desire for orthodontic treatment among Brazilian adolescents and their parents. BMC Oral Health. 2009;9:34.
5. Emilson CG. Potential efficacy of chlorhexidine against mutans streptococci and human dental caries. J Dent Res. 1994;73:682–91.
6. del Carmen Ahumada Ostengo M, Wiese B, Nader-Macias ME. Inhibitory effect of sodium fluoride and chlorhexidine on the growth of oral lactobacilli. Can J Microbiol. 2005;51:133–40.
7. Giertsen E, Scheie AA. Effects of chlorhexidine-fluoride mouthrinses on viability, acidogenic potential, and glycolytic profile of established dental plaque. Caries Res. 1995;29:181–7.
8. DePaola LG, Overholser CD, Meiller TF, Minah GE, Niehaus C. Chemotherapeutic inhibition of supragingival dental plaque and gingivitis development. J Clin Periodontol. 1989;16:311–5.
9. Ross NM, Charles CH, Dills SS. Long-term effects of Listerine antiseptic on dental plaque and gingivitis. J Clin Dent. 1989;1:92–5.
10. Niazi FH, Kamran MA, Naseem M, Mustafa A et al. Anti-plaque Efficacy of Herbal Mouthwashes Compared to Synthetic Mouthwashes in Patients Undergoing Orthodontic Treatment: A Randomised

Controlled Trial. Oral Health Prev Dent. 2018; 16(5): 409-416.
11. Sharma R, Trehan M, Sharma S, Jharwal V, Rathore N. Comparison of Effectiveness of Manual Orthodontic, Powered and Sonic Toothbrushes on Oral Hygiene of Fixed Orthodontic Patients. Int J Clin Pediatr Dent 2015;8(3):181-189.