

Clinical effect of chlorhexidine mouthwashes on patients undergoing orthodontic treatment

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ABSTRACT

Background: This study compared the short-term clinical effect of 0.12% chlorhexidine digluconate as an adjunct to regular oral hygiene practices.

Material and method: This study done on 26 adolescent (ages 11 to 15 years) undergoing orthodontic treatment. Thirteen subjects were experimental (CHX) and other 13 were control (C) groups. Baselines values were recorded 10 days after prophylaxis which include plaque index PL.I, gingival index G.I gingival fluid flow (G.F.F.) and discoloration index (D.I). Both groups (CHX and C) received soft tooth brushes with instruction to brush twice daily as well as CHX mouth rise twice daily with 15ml for 60 seconds for experimental groups .Reevaluation were performed 1, 2, 3 months after baseline except for the D.I which was only assessed at 3 months.

Result: no difference between groups was seen at baseline for any of the parameters. The changes of PL.I, G.I, G.F.F. at 1, 2, 3 month were statistically significant in the case of experimental groups, as the changes in the months. The D.I shows high scores in the experimental group as compared to control group but they were not statistically significant.

Conclusion: The data shows that the use of CHX in addition to regular oral hygiene habits was effective in reducing plaque and gingivitis in adolescent undergoing orthodontic treatment.

Key words: Chlorhexidine, mouthwash, orthodontics. (J Bagh Coll Dentistry 2006; 18(1) 66-68)

INTRODUCTION

Orthodontic objectives consist of obtaining the best aspect in the facial esthetics, an efficient masticator apparatus, stable treatment result, and healthy dental and periodontal tissues.⁽¹⁾

Orthodontic therapy may affect the periodontium by favoring plaque retention and food debris resulting in gingivitis , by directly injuring the gingiva as a result of over extended bands , and by creating excessive and/or unfavorable forces on supporting tooth structures.⁽²⁾ Also it's particularly difficult to maintain an acceptable hygiene when bands, wires and ligatures are involved⁽³⁾

A fundamental aim of all restorative dental treatment is to avoid the introduction of areas of retention for dental plaque .the detrimental effect of this on the teeth and their supporting issues has been convincingly documented⁽⁴⁾ .This aim cannot always be met when bands, arch wires and ligature necessary for orthodontic treatment are introduced into the oral cavity .in the treatment of orthodontic cases, therefore the gains achieved may be limited if uncontrolled dental plaque. Accumulation is allowed to take place resulting in the possible development of gingivitis/periodontitis (⁵).

Some of the earliest application of CHX for the control of plaque and gingivitis go back to 1970when the dental literatures ⁽⁶⁾ reported on the use of 0.2%CHX gluconate rinses, *twice* day, to prevent accumulation and subsequent gingivitis and this agree with Grundemann et al.⁽⁷⁾ It is known that adequate plaque control is different in patients undergoing orthodontic treatment, especially in the cases of children and adolescents. It is particularly difficult to maintain an acceptable hygiene when bands, wire and ligature are involved ⁽⁸⁾. Authors have reported on the development of hyper plastic gingivitis within 1 to 2 months after placement of appliance ⁽⁹⁾ and even the detection of slight attachment loss 2 years after removal of the appliance when patients have not been continually motivated regarding oral hygiene ⁽¹⁰⁾ . However if a thorough home care program is happen in gingival tissues during the orthodontic treatment can be reversed ⁽¹¹⁾ .

The purposes of this study were the following: -

1. To determine the short-term gingival changes in an adolescent population with healthy gingiva, undergoing orthodontic treatment and using chlorhexidine (CHX) rinses as an adjunct to regular and hygiene practices.

2. To asses any discoloration or staining in the structure of the teeth because it has been reported as side effect after long term use of rinsing agent ^(12,13).

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MATERIAL AND METHOD

Twenty six adolescent 11-15 years of age who were undergoing orthodontic treatment. All the participants had banding of at least on molar per quadrant they received a dental prophylaxis, which included the removal of plaque, calculus and stains from the teeth by scaling and polishing. Then they were divided into two groups; the treatment group, which used CHX, rinses as an adjunct to regular oral hygiene practices and the control groups, which depend on the regular oral hygiene practices only. After 10 days (baseline) the clinical parameters were recorded and these include PL.I⁽¹⁴⁾, G.I⁽¹⁵⁾, G.F.F was estimated in elected teeth which included 16, 15, 13, 46, 45, 43. Gingival exudates was sampled according to extra crevicular method of Brill⁽¹⁶⁾ and finally discoloration index⁽¹⁷⁾ after the recording the parameters, the treatment group as well as the control group were instructed to use toothbrush to be performed twice daily. Further more, the treatment group instructed to rinse twice a day for 30 second with 15 ml of CHX.

After 1 and 2 months the plaque, gingival indexes and gingival fluid flow were recorded and after 3 months all the above mentioned

parameters plus the discoloration index were recorded again for reevaluation.

RESULTS

The results of student t test showed that no difference between groups was seen at baseline for any of parameters. The mean PL.I at 30 days was showed lower scores for experimental group in compare to control group. At 60 and 90 days, the change of PL.I was statistically difference to the case of experimental group, as the changes in the mean was reflection of significant our scores observed in the experimental group as shown in table-1-. The mean G.I found at each examination is present in table -2-.The changes in the mean was reflections of significant low scores observed in the experimental group at 60 and 90 days. Gingival fluid flow was assessed in both experimental and control groups at baseline examination(x=0.88and x=1.23 respectively) a slight but significant increase in the G.F.F. was noted after 60 and 90 days in the control group as shown in table -3-. The D.I is assessed in table-4-, it was showed higher scores in the experimental group in compares with the control, but they were not statistically significant

Table 1: mean PL.I (x) and standard deviation (SD) in CHX and C groups.

	Base line		30days		60days		90days	
	X	S.D	X	S.D	X	S.D	X	S.D
CHX	0.05	0.06	0.26	0.10	0.42	0.31	0.61	0.3
C	0.09	0.03	0.48	0.10	0.75	0.25	1.79	0.21

P < 0.05 Significant

Table 2: Mean G.I (x) and stander deviation (SD) in CHX and C groups

	Base line		30days		60days		90days	
	X	S.D	X	S.D	X	S.D	X	S.D
CHX	0.07	0.11	0.29	0.10	0.51	0.14	0.62	0.10
C	0.10	0.11	0.71	0.15	0.95	0.10	1.39	0.11

P < 0.05 significant

Table 3: Mean G.F.F.(x) and stander deviation (SD) in CHX and C groups

	Base line		30days		60days		90days	
	X	S.D	X	S.D	X	S.D	X	S.D
CHX	0.88	0.12	0.95	0.10	1.01	0.11	1.20	0.10
C	1.23	0.11	1.52	0.11	1.62	0.15	1.98	0.11

P < 0.05 Significant

Table 4: Mean D.I (x) and standard deviation (SD) in CHX and C groups

	Base line		90days	
	X	S.D	X	S.D
CHX	0.31	0.11	1.92	0.21
C	0.12	0.21	0.86	0.16

P > 0.05 Non-Significant

DISCUSSION

During orthodontic treatment with fixed appliance the effectiveness of plaque removal procedure impaired. This can enhance the risk for development of gingival inflammation⁽¹⁸⁾. further more it has been previously reported that a short loss of periodontal support can be seen following orthodontic treatment with fixed appliance⁽⁵⁾. Recognizing these risks the orthodontic must make great effort to educate patients as regards proper dietary and oral hygiene habits in an attempt to minimized detrimental effects on teeth and periodontal tissues during orthodontic treatment. The results of the present study showed that there were significant reductions in the PL.I, G.I, G.F.F. in the experimental group in compared with the control group. This reduction of the clinical parameters due to the use of 0.12% of CHX and this agreement with the findings of (3,17,19).

The increase in the amount of plaque and gingival inflammation during the orthodontic treatment in the control group were thus presumably a result of impaired access to tooth surfaces with tooth brushing rather than unwillingness of children to clean the teeth property, this finding are in agreement with⁽⁸⁾. Also the results showed increase in D.I in the experimental group as a result of the experimental solution which was not clinically or statistically significant in this study and this agreement with the finding of others^(3,17).

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