

## The Effect Of Motivational And Reminder Therapy On The Compliance Of Patients Wearing Fixed Appliances

Research Article

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### Abstract

**Introduction:** Oral hygiene maintenance is very important during active orthodontic treatment. There is always a rapid decline in oral hygiene after the initial bonding due excessive plaque build-up around brackets which can cause caries, white spot lesions and other periodontal problems. Proper oral hygiene instructions and brushing technique should be followed to maintain good oral hygiene. Reminding orthodontic patients to maintain hygiene can improve oral hygiene status and this study was conducted to determine if reminder therapy helps in improving oral hygiene status in orthodontic patients.

**Materials And Methods:** 30 Subjects in whom orthodontic treatment was started recently were selected and divided randomly into two groups group 1 – reminder therapy group, group 2 – control group respectively. In Group 1, subjects received oral hygiene instruction reminders through text messages. In group 2, oral hygiene instructions were given before the start of the treatment but no reminders were sent later. 2% mercurochrome was also used as disclosing agent to check the amount of plaque accumulation. Patient was asked to follow modified Bass brushing technique.

**Results:** Results were assessed in terms of improvement in oral hygiene, and of plaque index scores. Plaque index scores were significantly lesser in the reminder therapy message group than in the control group at T0, T1 and T2.

**Conclusion:** A reminder therapy in the form of SMS is effective for improving oral hygiene compliance in orthodontic patients.

**Keywords:** Oral Hygiene; Orthodontic Patients; Reminder Therapy; Text Message Instructions; Plaque Index.

### Introduction

Oral hygiene is an important factor which is dependent on the patient and it can affect the outcome of the orthodontic treatment [1,2]. According to previous studies it has been found that a rapid decline in oral hygiene compliance was seen especially after the initial bonding. The orthodontic fixed appliances favour plaque accumulation and makes it difficult to maintain oral hygiene predisposing to plaque build-up, especially between the bracket and gingival margin [3]. Plaque build-up during orthodontic treatment may lead to gingival and periodontal problems and also exposes teeth to prolonged acid challenges which may lead to white spot lesions [5,6].

Earlier studies have shown that oral hygiene can be improved with

reward system or active reminder therapy [7,8]. It has been suggested that instructional videos should be made by the clinicians responsible for treating the target group patients, so that precise information is conveyed to the patient (Guin & Donaldson, 1991). Perhaps the main advantage of a reminder therapy over other instructional methods is that it can be used repeatedly at no additional cost, a suggestion made by McCulloch et al. (1983) who successfully developed a videotape for teaching dietary control to insulin dependent diabetics. The advantages of video presentation is attributed to its convenience and clarity of demonstration of related material, with the opportunity for self-learning in privacy and comfort. For now, texting may be characterized as not only the wave of the future but also the present [9]. Direct text messaging of patients began as a way to remind patients of appointments but may now be used to remind them of brushing, elastic

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wear, wearing retainers, and so forth. There are few studies which have introduced interventions that could improve oral hygiene compliance in orthodontic patients, including reward system[10].

The purpose of this study was to evaluate the effect of motivational and reminder therapy on the compliance of patients wearing fixed appliances.

### Materials And Methodology

Thirty adolescent patients scheduled to start an orthodontic fixed appliance treatment were randomly divided into two groups of 15. Each Plaque index (PI) scores were recorded in all patients, and they were given instructions regarding domestic oral hygiene maintenance on the day of fixed appliance placement and every month, that is, T0, T1 and T2 where T0 stands for the start of the treatment, T1 first month after the treatment and T2 is the second month of the treatment. Study group patients were enrolled in a WhatsApp group and were instructed to visit the dental setup weekly to record the indices again.

Experimental subjects (n = 15) were given oral hygiene instructions through text messages twice daily, once in the morning and once in the evening. The control group (n=15) were given only oral hygiene instruction before the start of treatment. Before bracket bonding, all patients had undergone a session of oral hygiene aimed at obtaining a plaque index of zero and they also received standardized instructions on oral hygiene procedures. Both groups watched an audio-visual video on how to properly brush with a conventional toothbrush, using the Bass technique. The treatment group received text messages through whatsapp messenger daily for three months as a reminder and encouragement to practice good oral hygiene. These messages addressed the importance of oral hygiene and served as a reminder. At their first review appointment, each subject was examined for plaque index and subsequent index were also taken at first, second and third week. The plaque index scoring was done on three teeth, Upper right incisor, lower left central incisor and lower left first or second premolar. Second premolars were scored for all cases, unless they had been extracted as part of orthodontic treatment, in

which case first premolars were scored.

At the following appointment, after about one month, the participants' compliance to oral hygiene was measured using modified plaque index and 2% mercurochrome disclosing agent was used. It was recorded by application of the disclosing agent and then, analysing the amount of plaque by circulating a periodontal probe between the bracket base and free gingival margin at six sites around each bonded tooth. The plaque index (PI) was scored as described (Table 1). Second premolars were scored for all cases, except they had been extracted as part of orthodontic treatment, in which case first premolars were scored.

### Results

Data was analysed using the Statistical Package for Social Sciences version 16.0 for Windows. A Student's t-test was used to calculate the mean difference in the study and control groups (significance level 0.05).

The mean difference in plaque scores between study group and control group in the first month was 0.36 (control group .92; S.D +/- 0.37) (study group 1.28; S.D +/- 0.45). There was no statistically significant difference observed between the groups in the first month. The mean difference in plaque scores between study group and control group in the second month was -0.44 (control group 1.16; S.D +/- 0.62) (study group 0.72; S.D +/- 0.51). but there was no statistically significant difference observed between the groups in the second month also. The mean difference in the plaque scores between study group and control group in the third month was 0.85 (control group 1.34; SD +/- 0.67) (study group 0.49; SD +/- 0.43) still there was no statistically significant difference observed between the groups in the third month as well.

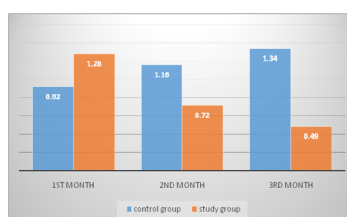
### Discussion

Poor oral hygiene is one of the factors which hampers successful orthodontic treatment. Increased amount of plaque around the brackets not only causes carious lesions, but also leads to increased friction while retraction. Previous studies have reported

**Table 1: Plaque index (PI) codification**

|   |   |
|---|---|
| 0 | No plaque   |
| 1 | Discontinuous band of plaque at gingival margin               |
| 2 | Up to 1 mm continuous band of plaque at gingival margin       |
| 3 | Amount of plaque wider than 1 mm but less than 1/3 of surface |
| 4 | Plaque covering tooth around 1/3rd and 2/3rd of surface       |
| 5 | Plaque covering almost 2/3rd or more of surface               |

**Figure 1: Plaque index scores of control and study group at three different time intervals**



that sending SMS reminders to patients on oral hygiene instructions leads to a marked improvement in their oral hygiene.

In our study, we had used disclosing agent to accurately quantify dental plaque. The disclosing agent used was 2% mercuriochrome and it was applied with an applicator tip. In this study the plaque scores in the control group did not show much improvement whereas the study group in which we had given SMS reminders plaque scores reduced significantly. Major limitation in this study was the sample size and because of the smaller sample size, the difference in the plaque scores in the study groups were statistically significant even though they were clinically significant. Total plaque scores in the study group especially for plaque gingival to the bracket where reductions were around double those found higher up the teeth. In the group who received reminder therapy the plaque scores were actually lower at the end of the study than at the beginning. In the control groups scores did not improve much. The mean of plaque scores in the control group at T<sub>0</sub>, T<sub>1</sub>, T<sub>2</sub> were 0.92, 1.16, 1.34 and these values point towards a worsening plaque control whereas in the study group at T<sub>0</sub>, T<sub>1</sub>, T<sub>2</sub> the values were 1.28, 0.72, 0.49 but these indicate an improvement in plaque control

## Conclusion

Reminder therapy in the form of daily SMS is an effective tool in reducing plaque scores in patients undergoing orthodontic treatment.

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