

ORIGINAL RESEARCH

Effectiveness of Toothbrushing on periodontal clinical parameters

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ABSTRACT

Background: Tongue movement and saliva flow has some degree of potential to clean debris from facial, lingual, interproximal spaces and occlusal pits but is less effective in complete removal of plaque. **Materials and Methods:** The present study was having twenty subjects in the age group of 20-46 years, selected from the undergraduate clinic, Periodontics of the Subharti Dental College, Meerut. The subjects displayed good general health and were diagnosed with adult periodontitis.

Results: There was a significant reduction in OHI scores and pocket depths from baseline and 3 and 6 months.

Conclusion: Toothbrushing and maintenance of oral hygiene has a positive effect on the microbiota and leads to improvements in clinical parameters.

Keywords: Toothbrushing, pocket depths, oral hygiene index –Simplified,

INTRODUCTION

The main objective of time-honored periodontal treatment is to resolve the inflammatory lesion in the periodontal tissues. This engages the removal of plaque and calculus from tooth surfaces, either with scaling and root planing alone or combined with periodontal surgery.

Patients competency in achieving good mechanical plaque control is the key factor. Scaling and root planing without effective plaque control during the maintenance phase leads to subgingival microbial recolonization within a few weeks.^[1] Also, poor oral hygiene results in unsuccessful periodontal therapy and poor results of regenerative surgeries and may also cause periimplantitis.^[2]

Good supragingival plaque control is mandatory for preventing or arresting the periodontal diseases. Tooth brushing is the best tool for achieving this goal.^[3]

Literature states that toothbrushing alone removes only 60% of overall plaque at each episode of cleaning.^[4] Toothbrushing effectively removes plaque from facial surfaces but, interproximal areas need more specific cleaning practice. Various interdental aids have been developed to achieve this goal such as interdental brushes, wooden tips, floss etc.^[5]

The aim of this study was to estimate the changes in oral hygiene scores and pocket depth reduction after performing oral hygiene procedures and maintenance at the interval of 3 and 6 months.

MATERIALS & METHODS

The present study was having twenty subjects in the age group of 20-46 years, selected from the undergraduate clinic, Periodontics of the Subharti Dental College, Meerut. The subjects displayed good general health and were diagnosed with adult periodontitis. Each patient displayed an interproximal intrabony defect in a posterior tooth which was evident radiographically and which manually probed equal to or more than 6mm. Adequate oral hygiene performance was measured by oral hygiene index –simplified. Ethical clearance was obtained from the institutional ethical committee for the present study.

Written consent was obtained from each participant. Each patient was given initial periodontal therapy on an individual basis including instructions in proper oral hygiene techniques, scaling and root planing. Additional instructions and re-enforcement of oral hygiene aids was provided at 3 months and 6 months to test group. The clinical parameters measured were oral hygiene index-simplified (OHI-S) and probing depths pre operative at baseline and post operative at the interval of 3 months and 6 months.

ARMAMENTARIUM

- I. Diagnostic instrument set for clinical examination – mouth mirror, tweezers, William’s periodontal probe, explorer no. 23.
- II. Manual Scaling, Root planing and Curettage instruments – Hu Friedy sickle scaler, universal scaler and cures.
- III. Ultrasonic Scaler

Statistical analysis: Once data was collected and tabulated using MS Office Excel, the tabulated data was then analyzed on SPSS version 10.0. Descriptive Analysis was done using Percentages, Proportions, Mean and Standard Deviations and inferential Analysis was done using unpaired T-tests, chi-square. P value of <0.05 is taken as significant, P < 0.001= highly significant and P > 0.05 as non significant

RESULTS

On applying unpaired student “t” statistics to test the significant difference in oral hygiene improvement for group “A” and “B” patients pre operatively and post operatively at 5% and 0.01% level of significance, the following effect was found: (**Table 1**)

Table 1. Statistical test application on OHI-S scores for test group (group A)

TIME	MEAN ± STANDARD DEVIATION	T calculated	T tabulated (18,0.05)=2.10 (18,0.001)=3.92
BASELINE VERSUS THREE	1.15±0	5.22	P < 0.05* P < 0.001*

MONTHS			
BASELINE VERSUS SIX MONTHS	1.07±0.2	2.43	P < 0.05* P > 0.001**

* P < 0.05 =significant, * P < 0.001= significant

** P > 0.001= non significant

Table 2. Statistical test application on OHI-S scores for control group (group B)

TIME	MEAN ± STANDARD DEVIATION	T calculated	T tabulated (18,0.05)=2.10 (18,0.001)=3.92
BASELINE VERSUS THREE MONTHS	1.05±0.55	6.5	P < 0.05* P < 0.001*
BASELINE VERSUS SIX MONTHS	1.37±0.05	6.2	P < 0.05* P < 0.001*

* P < 0.05 =significant, * P < 0.001= significant

Table 3. Statistical test application on Probing Depths for test group (group A)

TIME	MEAN ± STANDARD DEVIATION	T calculated	T tabulated (18,0.05)=2.10 (18,0.001)=3.92
BASELINE VERSUS THREE MONTHS	3.6± 0.48	5.9	P < 0.05* P < 0.001*
BASELINE VERSUS	3.5±0.72	5.22	P < 0.05*

SIX MONTHS			P < 0.001*
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* P < 0.05 =significant, * P < 0.001= significant

Table 4. Statistical test application on Probing Depths for control group (group B)

TIME	MEAN ± STANDARD DEVIATION	T calculated	T tabulated (18,0.05)=2.10 (18,0.001)=3.92
BASELINE VERSUS THREE MONTHS	3.9±0.29	9.2	P < 0.05* P < 0.001*
BASELINE VERSUS SIX MONTHS	4±0.37	10	P < 0.05* P < 0.001*

* P < 0.05 =significant, * P < 0.001= significant

DISCUSSION

The main symptoms of periodontal disease involve loss of periodontal tissue attachment, bone and pocket formation. It is imperative to recognize the role of bacteria accumulating in the periodontal pocket. There is ample literature which upholds the effectiveness of scaling and root planning in removing plaque deposits by scraping on tooth surface within the periodontal pocket, thereby reducing pocket depth. ^[6]Toothbrushing decreases the gingival bacterial diversity and helps in preventing periodontitis. ^[7]

Mechanical cleaning alone is not sufficient so adjunctive protocols have been advocated. Multiple trials have also used antimicrobial agents and antiseptic rinses as an addition to conventional therapy.

In one study it was observed that bleeding on probing, pocket depth and levels of subgingival counts and putative periodontal pathogens was greatly reduced after 14 days of subgingival root brushing. This reduced probing depths by a mean of 1.8mm and reduced number of bacteria. Also, no significant clinical changes were seen after 14 days where patients pre existing oral hygiene regimen was unaltered. ^[8]

In test group (Group A) pretreatment mean OHI-S score was 2.07± 0.50 and had decreased to 1.0±0.3 at 6 months interval. In control group (Group

B) mean OHI-S score was 2.08 ± 0.48 and 0.71 ± 0.53 pretreatment and post treatment respectively.

Mean probing depth in test group was 7.8 ± 1.13 mm pre operatively and it was reduced to 4.3 ± 1.85 mm (average reduction of 3.5 mm) post operatively. In Control group it was 7.9 ± 1.1 mm and $3.9 \pm .73$ mm (average reduction 4 mm) pre and post operatively. Inter group comparison of probing depth reduction was not significant statistically.

The improvement in mean OHI – S score in the present study support the observed treatment effects obtained under a strict plaque control regimen. It is in conformity with various studies. Cortelloni et al in 1993 explained that the long term clinical trials have in fact demonstrated that good clinical results can be obtained and maintained over time only if an optimal plaque control regimen is instituted. Conversely, deterioration of the root hygiene levels result in impairment of obtained therapeutic effect. ^[9]

Karapataki et al in 2000 evaluated the oral hygiene performance by plaque index and soft tissue index and showed that the post surgical compliance was in general of a high level with few site showing plaque or gingivitis. ^[10]

Zybutz et al 2000 suggested that the level of post operative oral hygiene and efficacy of supportive care programme may be the most critical for G.T.R. treatment outcomes. ^[11]

Interdental cleaning aids provide a significant benefit over brushing as a monotherapy. But, the use of these aids may not achieve the same results if not effectively performed. They rely on patient comfort, acceptance and the motivation of the patient.

Presently no specific protocol exists with proven superiority, in terms of effectiveness over scaling and root planning procedures. Some clinicians advocate the use of antibiotics for specific microbial load. But the evidence for benefit of this drug based control of pathogens is not satisfactory. Bacterial microflora recolonises the treated sites after some time. the degree of recolonization depends on treatment modality, distribution patterns of microbiota elsewhere in the oral cavity and the quality of patients oral hygiene protocol. Further efforts are required to optimize procedures addressing the microbial colonization of periodontal pocket. ^[6]

CONCLUSION: The findings of this study support the earlier reportings that toothbrushing and maintenance of oral hygiene has a positive effect on the microbiota and leads to improvements in clinical parameters. Moreover, if oral hygiene maintenance is maintained constantly enough, the bacterial plaque has limited chances of invading the periodontal tissues.

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