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Original Article

Effectiveness between two tooth brushing methods on removing dental plaque

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Abstract

Background

Biofilm usually is a group of micro-organisms in which bacterial cells adhere to each other. It may form on a living or non-living surfaces within a self-produced matrix of glycocalyx. Recently, plaque has been identified as a biofilm, and its structure, microbiology and pathophysiology have been described. The effectiveness between modified bass technique and normal brushing technique has been compared in this study.

Material & Methods

Sixty auxiliary workers working in Nobel Medical College and Teaching Hospital were selected using systematic random sampling technique. Plaque accumulation was assessed on the index teeth using Silness and Loe plaque index. Both normal tooth brushing practices and modified Bass technique were asked to perform using a standard tooth brush and fluoridated dentifrices without label was used for all the subjects after the morning breakfast. The difference of the PI scores recorded in different examinations was assessed using ANCOVA test.

Results

The mean PI score was found similar for normal brushing and modified bass technique at the base line examination ($P < 0.05$). The modified Bass technique was more effective in removing plaque than normal tooth brushing ($P < 0.05$)

Conclusion

Tooth brushing is the most common, easy and effective method of plaque control. At the same time tooth brushing with correct technique reduces plaque effectively and maintains the integrity of tooth and surrounding periodontium. Modified Bass technique plays a vital role in prevention of plaque control, dental caries and periodontal disease.

Keywords:

Modified Bass technique, Oral Hygiene, Plaque control

Introduction

Biofilms are complex group of bacteria which are found in the human body. Recently, dental plaque has been identified as a biofilm, and its structure, microbiology, and pathophysiology have been described [1]. If the biofilms are not removed regularly, subgingival plaque in

patients with periodontitis has been associated with different systemic diseases and disorders [1]. Tooth brushing is one of the most effective and common method of mechanical plaque removal. Normal brushing consists of horizontal, vertical and circular movements [2]. Studies have shown that manual toothbrushes are

effective tool in preventing gingivitis and removing bacterial plaque [3].

Tooth brushes are over the counter products, hence no special instructions for use is given. The normal tooth brushing practice if adequately performed is sufficient to control dental plaque [4]. Tooth brushing reduces dental plaque and improves oral hygiene. Dentist can improve the oral hygiene of the patient using tooth brushing by two means. Either advocating use of specific tooth brushing method or by improving the performance of normal tooth brushing method but most of the studies have shown specific tooth brushing technique have better result as compared to normal tooth brushing practices [5]. The aim of the present study is to compare effectiveness between modified bass technique and normal brushing technique.

Materials and Methods:

The present experimental study was conducted in the Periodontics department of Nobel Medical College and Teaching Hospital. The data was collected by personnel interview and clinical examination. The patients were given information regarding their participation in the study and all individual gave written informed consent. Ethical clearance was obtained from Ethical committee of Nobel Medical College and Teaching Hospital. The Study duration was from January 2017 to March 2017.

Subjects:

Sixty auxiliary workers working in Nobel Medical College and Teaching Hospital were selected using systematic random sampling technique. It comprised of twenty males and forty females with age ranging from 16 to 28 years. Subjects having periodontal pocket ≥ 4 mm, patients undergoing orthodontic treatment, crowding, fewer than 6 natural teeth in each quadrant and subjects under antibiotic coverage were excluded from the study.

Subject voluntarily gave written informed consent.

Plaque accumulation was assessed using Silness & Loe plaque index [6], index teeth were assessed. The examiner (Dental surgeon posted in the department) was trained and experienced in recording oral hygiene index. The examiner was uninformed of the tooth brushing technique used by the subjects while recording plaque Index.

Tooth brush and tooth paste:

Both normal tooth brushing practices and modified Bass technique[7] were performed using a standard tooth brush (The Humble Co., Sweden) and fluoridated dentifrices without label was used.

PART I Normal tooth brushing practices :

The participants were asked not to perform oral hygiene procedures for 48 hours. The amount of dental plaque using the Silness & Loe plaque index was recorded [6]. After baseline record of PI score, participants were instructed to brush twice daily for three weeks. Any other instruction or oral hygiene advice was not given. Subjects were not allowed to use any other oral hygiene product other than those permitted for the study. Recall visit were at two days, one and three weeks. Plaque was recorded similarly as the criteria used at baseline. Participants were not reinforced during recall visit.

PART II Modified Bass brushing technique:

Second part of the experiment was conducted after a period of 2 weeks. During this period subjects were not given any specific tooth brushing instructions.

A new prophylaxis to remove plaque and calculus was carried out. The same 60 subjects were asked not to perform oral hygiene procedures for 48 hours. Then the same examiner evaluated the amount of plaque using Silness & Loe plaque index [6] for mesio-facial, facial, disto-facial and lingual surfaces. After the plaque index was recorded at baseline, the subjects

were instructed to brush their teeth using modified Bass technique [7].

Participants were asked to brush their teeth using modified Bass technique which was demonstrated and hands on to all subjects and confirmed all subjects learnt it properly. Recall visits were same as part one schedule. Participants were not reinforced during recall visit. No other instructions to maintain oral hygiene was advised.

Statistical Analysis:

PI scores were as mean ± SD. The mean PI was calculated for mesio-facial, facial, disto-facial and lingual surfaces for all individuals. The difference of the PI scores recorded in different examinations was assessed using ANCOVA test. The significance value was set at (p <0.05) level.

Results:

The Mean PI score were similar for normal brushing and modified bass technique at the base line examination (p<0.05). The modified Bass technique was found to be more effective in plaque removal than normal tooth brushing (p<0.05) **Table 1**. Although both the technique showed significant reduction in plaque score for all the surface mesio-facial, facial, disto-facial and lingual as compared to base level examination (p<0.05). Mean PI score reduction was significantly higher with modified Bass technique as compared to normal tooth brushing practices (p<0.05). The results showed that the modified Bass technique again significantly reduces mean plaque score for all (p<0.05) after 7 days. After 21 days, PI score was reduced significantly by modified bass technique where as normal tooth brushing showed no significant reduction. (p<0.05)

Table 1 (Plaque index score)

| Brushing method | Score (± SEM) at Examination | | | |
|-------------------------|------------------------------|---------------------|---------------------|-------------|
| | Baseline | 2 nd day | 7 th day | 21 day |
| Normal brushing | 0.43 ± 0.22 | 0.50 ± 0.32 | 0.95 ± 0.80 | 1.05 ± 1.00 |
| Modified Bass Technique | 0.44 ± 0.27 | 0.32 ± 0.34 | 0.39 ± 0.30 | 0.44 ± 0.31 |

Discussion:

Different tooth brushing technique has been developed eg: Leonard’s, Stillman’s, Charter’s, Fones’ and Bass [8]. Besides these techniques being taught by Dental professionals still over 90% of the population perform their personal tooth brushing method, the popular “scrub” method. [9].

While this successfully removes plaque from the teeth, it is generally considered harmful because vigorous scrubbing can lead to gingival recession and with dentifrices consisting of abrasives can create tooth abrasions. Bass technique of tooth brushing is the most recommended method because it mainly emphasizes sulcular placement of bristles. Studies have shown effectiveness of Bass Method [10] and several studies have shown effectiveness of Bass method as compared to other tooth brushing techniques. In the present study modified Bass technique was found to be effective over normal tooth brushing in plaque removal which is in accordance with study conducted by Kropf JL[11].

Kremers L et al [12] and Zhang JH et al [13] showed in their study that interdental plaque was more effectively removed by Bass technique than other brushing techniques. This might be the reason of modified Bass technique being most effective over other techniques.

Our study was consistent with the study done by McClure DB and Sangnes G et al

[14, 15] who conclude that modified Bass technique was efficient in removing interdental plaque whereas Smutkeeree A et al [16] in his study observed that both modified bass and horizontal scrub method effectively reduced dental plaque with no significant difference between them.

In our study normal brushing technique was effective in removing plaque but modified Bass technique was found to be more effective and consistent in removing plaque which is in accordance with the study reported by M PoyatoFerrera [17].

The modified bass technique was more effective in lingual sites of anterior sextant. Clinical practices showed us patient pays poor attention to lingual sites during their normal tooth brushing practice because most of the people cannot brush lingual surface of the teeth properly [18].

Conclusion

Tooth brushing is the most common, easy and effective method of plaque control. At the same time tooth brushing with correct technique reduces plaque effectively and maintains the integrity of tooth and surrounding periodontium. Whereas normal horizontal scrub tooth brushing remove plaque but has detrimental effect on tooth and surrounding structures. Modified bass technique differs from other techniques in that it has sweeping motion from cervical to incisal or occlusal surface and helps in excellent intrasulcular cleansing.

Dental professionals should advocate modified Bass technique as plaque control measure as it plays a vital role in controlling dental caries and periodontal disease. Hence correct brushing technique improves the level of oral hygiene and subsequently decreases the risk of different dental diseases.

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