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Comparative evaluation of efficiency of regular floss with water floss and only regular floss in oral hygiene status - A randomised clinical trial

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Abstract
Periodontitis is a chronic inflammatory disease that affects all parts of the periodontium. the aids for maintaining oral hygiene are toothbrushes, regular floss, water floss in this study we are assessing the effectiveness water floss with regular floss and regular floss in oral hygiene status. A randomized controlled clinical trail was conducted to compare the plaque removal efficiency among undergraduates of karpaga vinayaka institute of dental sciences. Pre and post flossing scores are calculated and found to be statistically significant with a p value of 0.004. The results showed that regular floss with water floss is more efficient in removing interdental plaque

Keywords: Flossing, plaque, water floss, regular floss, periodontitis

Introduction

Periodontitis is a chronic inflammatory disease that affects all parts of the periodontium and causes irreversible damage [1]. It is the most common oral disease worldwide, with an age-standardized prevalence of 11.2% [2]. It is a multi-factorial disease, with risk factors such as biofilm, inadequate oral hygiene, diabetes mellitus and smoking [3].

The accumulation of dental plaque and calculus is usually caused by improper toothbrushing techniques, failure to carry out interdental cleaning and irregular dental visits and poor oral hygiene. The aids for maintaining oral hygiene are toothbrushes, toothpaste, mouthwash, tongue scrapers, interdental brushes, floss and tooth picks [3].

Dental floss is a soft thread of silk or similar material used to clean interdentally which is invented by Dr. Levi Spear Parmly and proven effectively control the plaque. Water flosser is a device that aims a stream of water which can help remove food particles interdentally invented by Dr. Gerald Moyer. It can also be used for patients with orthodontic appliance and implants [4]. Only Few studies are available to assess effectiveness on this product. In this study we are assessing the effectiveness water floss with regular floss and regular floss in oral hygiene status.

Materials and Methods Study design

A randomized controlled clinical trial was conducted to compare the plaque removal efficiency of water flosser with regular floss vs regular floss. It was a Single blind study with complete mouth technique

Sample size and eligibility criteria

Study is conducted at karpaga Vinayaka institute of dental sciences among 100 patients aged 18 to 23 years old. Subjects are selected with moderate to fair oral hygiene and minimum of 20 scoreable teeth, probing depth <3. Patients with poor oral hygiene and pocket depth more than 4 mm are not included in this study. The patients are asked to not use any flossing for at least 1 week prior to the study and informed consent form obtained. Based on plaque index, the effects of oral hygiene were assessed by using water floss.

Plaque assessment and intervention procedures

Silness and Loe plaque index (Silness and Loe, 1964) was measured for all the subjects prior to the intervention by an examiner who was blind to the type of aid used. After recording index, among 100 patients, randomly selected 50 patients belong to group A and the other half belong to group B.

Group A was done with both regular floss with water floss and group B with only regular floss. The same investigator measured the plaque index after intervention

Statistical Analysis

Data was entered into excel sheet and analyzed using SPSS software. Mean and standard deviation, percentage reduction in the plaque scores were calculated and comparison is done and plotted in bar graphs.

Results

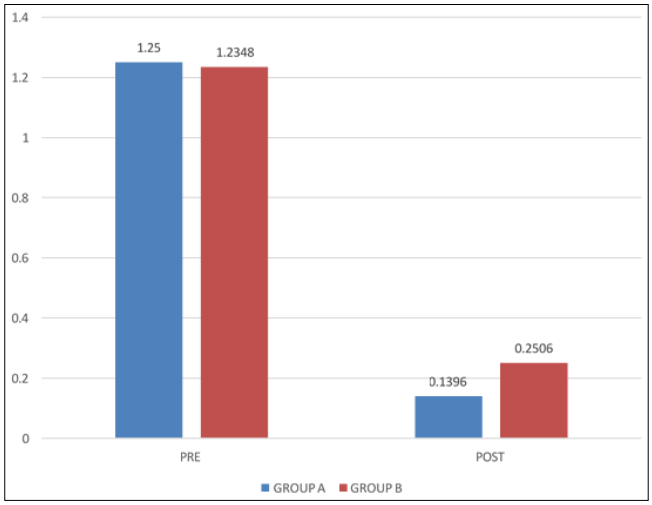
A total of 100 subjects is selected for the study. Among them, the mean plaque score for group A and group B at baseline are recorded as 1.25 and 1.24 respectively as preflossing scores. There is no statistically significant difference in the plaque scores between the groups before the use of respective interdental aids (Bar diagram 1).

After post flossing, plaque index is calculated and score are recorded as 0.13 and 0.25 for regular floss with water floss and only regular floss respectively. There is a statistically significant difference in plaque scores after use of interdental aids (Bar diagram 1).

Group Statistics

Table 1: Comparison of Pre and post plaque score

Flossing	Group	Mean	Standard Deviation	P value
Pre	Group A Group B	1.2500 1.2348	0.66558 0.67903	0.865
post	Group A Group B	0.1396 0.2506	0.15757 0.31458	0.004



Bar diagram: Comparison of Pre and post plaque score

Discussion

Randomised control clinical trial was conducted to compare the plaque removal efficiency of regular floss with water floss and only regular floss. Previous studies were only conducted involving distinct use of regular floss and water floss in split mouth technique [5]. Our study is based on combination of water floss with regular floss and only regular floss in complete mouth technique. subjects without any signs of periodontitis were included in the study. Silness and Loe Plaque index was used in this study, this index is valid, reliable and easily learned. This has been suggested as acceptable index to test the efficiency of oral hygiene in plaque removal [5]. Goyal *et al* conducted a study comparing water flosser with air floss and results showed water flosser to be better than air floss in reducing plaque and gingival bleeding after four weeks of use [4].

A systematic review found that groups using tooth brush plus oral irrigation had better oral health in general compared to tooth brush alone. In the same systematic review it was also observed that groups using oral irrigation had better gingival, bleeding and plaque scores compared to groups using floss at the end of one month [6]. Goyal *et al* conducted another study to compare the plaque removal efficacy of a water flosser to string floss combined with a manual toothbrush after a single use shows water floss to be more effective with toothbrush in plaque removal [7].

This study turned out to be effective in plaque removal using regular with water floss than only regular floss. They have been shown to reduce gingivitis, bleeding, probing pocket depth, host inflammatory mediators, and calculus [8]. Providing education on water floss turns out be a valuable tool in maintaining oral health. However, the limitations include discomfort, time consuming, and low hand dexterity.

Conclusion

The results showed that regular floss with water floss is more efficient than only regular floss in removing interdental plaque. Water floss with regular floss could be recommended in patients with moderate to fair oral hygiene to deal with food lodgement.

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