

Original Article

Comparative Assessment of the Efficacy of two Commercially available Manual Tooth Brushes for removal of Dental Plaque

Avineet Kaur¹, Raj Abhay Singh², Kavya Bhola³, Iqra Khilji⁴, Shivani Dhawan⁵, Deepak Kochar⁶

¹Assistant Professor, ^{5,6}Professor, Dept of Periodontology and Oral Implantology, Maharishi Markandeshwar College of Dental Sciences and Research, Mullana Ambala, Haryana, ²Assistant Professor, Dept of Orthodontics and Dentofacial Orthopaedics, Surendera Dental College and Research Institute, Sri Ganganagar, Rajasthan, ³PG Student, Dept of Pedodontics and Preventive Dentistry, Dasmesh Institute of Research and Dental Sciences, Faridkot Punjab, ⁴Associate Dentist, Rajas Dental And Wellness, Patiala, Punjab, India

ABSTRACT:

Background: Efficient plaque removal is essential for dental caries and gingivitis prevention. It is an important aspect for the perpetuation of proper oral hygiene. The present study was conducted to compare the efficacy of two commercially available manual tooth brushes for removal of dental plaque. **Materials & Methods:** The present study was conducted on 10 dental students age ranged 18-22 years. In Phase I, plaque score was brought to zero and subjects were given Colgate sensitive tooth brush and plaque score was recorded in the morning for 10 consecutive days. In phase II, Colgate- 17 X slim soft charcoal tooth brush was given after the span of 10 days. All the subjects were instructed to follow Modified Stillman's technique of brushing with same frequency and duration with both brushes. **Results:** Colgate sensitive tooth brush and Colgate- 17 X slim soft charcoal tooth brush was used on 10 subjects in present study. The mean plaque score with Colgate sensitive was 1.062 and with Colgate slim soft charcoal tooth brush was 0.750. The difference was significant ($P < 0.05$). **Conclusion:** There was better plaque control efficacy with Colgate Charcoal tooth brush as compared to Colgate sensitive tooth brush.

Key words: Coalgate, Plaque, Tooth brush.

Received: 22 May 2018

Revised: 19 June 2018

Accepted: 27 June 2018

Correspondence to: Dr. Avineet Kaur, Assistant Professor, Dept of Periodontology and Oral Implantology, Maharishi Markandeshwar College of Dental Sciences and Research, Mullana Ambala, Haryana, India

This article may be cited as: Kaur A, Singh RA, Bhola K, Khilji I, Dhawan S, Kochar D. Comparative Assessment of the Efficacy of two Commercially available Manual Tooth Brushes for removal of Dental Plaque. J Adv Med Dent Scie Res 2018;6(9):62-65.

INTRODUCTION

Efficient plaque removal is essential for dental caries and gingivitis prevention. It is an important aspect for the perpetuation of proper oral hygiene. In obtaining and preserving good oral health and to avoid periodontal diseases efficient plaque removal aids are most essential. As a solitary means of plaque removal manual toothbrush is extensively used by the public. Effective plaque control and good oral hygiene maintenance play a solid role in the maintaining oral health and prevention of these diseases.¹

There are many adjuncts for maintaining oral hygiene but by far the most widely accepted and adopted tooth cleaning tool is still the toothbrush. Numerous brands of toothbrushes are emerging these days with every company claiming superiority of their product over others. People being the consumer sector, also choose brushes based on cost, availability, advertising claims, family tradition or habit, shape, color due to lack of professional advice when it comes to selection of a toothbrush.² While selecting an effective toothbrush, the bristles are perhaps the most important consideration. As there are so many varieties of

brushes currently available and also due to constant development of new brushes, the dental professionals must have a high level of knowledge of these products and advice the patients accordingly.³

Colgate slim soft charcoal tooth brush has been introduced recently by Colgate Palmolive limited. This toothbrush has soft bristles that have been infused with Japanese charcoal. The charcoal makes the brush naturally anti-bacterial.⁴ The charcoal's deodorization properties helps to naturally clean your mouth, and remove dental plaque, while also preventing any bacterial build up between brushings. Colgate sensitive is another product of same company. The Colgate 360° sensitive toothbrush is a manual toothbrush providing gentle, proven plaque removal for patients with exposed dentine and/or dentine hypersensitivity.⁵ The present study was conducted to compare the efficacy of two commercially available manual tooth brushes for removal of dental plaque.

MATERIALS & METHODS

The present study was conducted in the department of Periodontics. It comprised of 10 dental students age ranged 18-22 years with normal occlusion, no caries on facial and lingual surfaces of teeth, with mild gingivitis. All were informed regarding the study and written consent was obtained. Ethical clearance was obtained from institutional ethical committee.

General information such as name, age, gender etc. was recorded. The study was divided into 2 phases. In Phase I, plaque score was brought to zero and subjects were given Colgate sensitive tooth brush and plaque score was recorded in the morning for 10 consecutive days. In phase II, Colgate- 17 X slim soft charcoal tooth brush was given after the span of 10 days. (Fig 1, 2, 3 and 4).

All the subjects were instructed to follow Modified Stillman’s technique of brushing with same frequency and duration with both brushes. Results thus obtained were subjected to statistical analysis using chi- square and T- test. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of tooth brushes

| Tooth brush | Colgate sensitive tooth | Colgate charcoal tooth brush |
|--------------------|-------------------------|------------------------------|
| Number of subjects | 10 | 10 |

Table I shows that Colgate sensitive tooth brush and Colgate- 17 X slim soft charcoal tooth brush was used on 10 subjects in present study.

Table II Mean plaque score with both brushes

| Sample | Mean | S.D | t- test | P value |
|--------------|-------|-------|---------|---------|
| All Colgate | 1.062 | 0.349 | 6.487 | < 0.01 |
| All Charcoal | 0.750 | 0.331 | | |

Table II, graph I shows that mean plaque score with Colgate sensitive was 1.062 and with Colgate slim soft charcoal tooth brush was 0.750. The difference was significant (P< 0.05).

Graph I Mean plaque score with both brushes

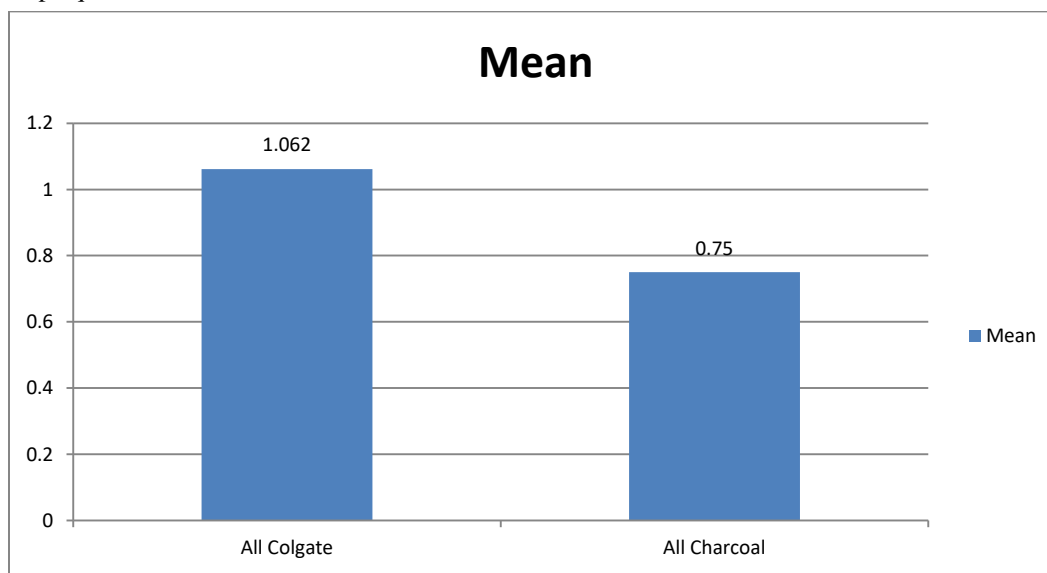


Figure 1: Both tooth brushes



Figure 2: Before and after prophylaxis



Figure 3: After 10 days with Colgate sensitive tooth brush



Figure 4: After 10 days with Colgate charcoal tooth brush



DISCUSSION

Tooth brushing is the most widely used method for plaque control, and a wide variety of toothbrushes is available in the market. Studies comparing the efficacy

of available toothbrushes are scarce. The use of soft bristles has been recommended to improve plaque reduction while minimizing harm to the gingival tissues. Different varieties of manual toothbrushes are available in the market now. A direct relation is present between bacterial plaques on the tooth surfaces causing gingival inflammation.⁶ Various epidemiological surveys admit the strong association between plaque and gingivitis. Toothbrush is the most important and frequently used tool used by the public to prevent periodontal disease as a good mechanical plaque control device.⁷ The present study was conducted to compare the efficacy of two commercially available manual tooth brushes for removal of dental plaque.

In present study, all subjects were advised to follow Modified Stillman's technique of brushing with same frequency and duration with both brushes. We found that mean plaque score with Colgate sensitive was 1.062 and with Colgate slim soft charcoal tooth brush was 0.750. It is in agreement with Claydon et al.⁸

Sharma et al⁹ conducted a study which consisted of fifty seven subjects with age ranging from 15 to 28 years distributed into 3 different groups, Group A (multi angle cross bristled toothbrush), Group B (circular bristled toothbrush), Group C (z shaped bristles toothbrush). Study was single blinded, randomized clinical trial. Rustogi modified navy plaque index (RMNPI) and Sulcular bleeding index (SBI) were assessed at baseline, 7th day and 21st day. All brushes showed significant reduction in plaque score over 3 weeks period. Comparison of mean plaque index and Average SBI between the three groups shows that Group C has the highest value of 0.9086 (RMNPI) and 0.9204 (SBI). However, the reduction of plaque scores is greater in Group C (oral B shiny clean) when compared to other groups.

Colgate sensitive tooth brushes have tightly packed, tapered bristles reach interproximal and along the gingival margin to remove plaque, a raised cleaning tip provides better access to posterior areas, soft rubber polishing cups gently remove surface stains, a textured tongue and cheek cleaner removes odour causing bacteria and superior plaque removal compared to a leading soft manual tooth brush.¹⁰

Mohammed et al¹¹ carried a study on 13-15 year old school children to test the efficacy of two bristle designs of toothbrushes in single use plaque removal. The study was carried out in two test periods with a wash out period of 4 days between each test period. On day one of each test period plaque removal was carried out for all participants through oral prophylaxis following which they were asked to suspend oral hygiene practices for 24 hours. On the second day, the subjects were asked to brush with the allocated tooth brush for 2 minutes. A comparison of percentage reduction of the mean plaque scores between the two brushes showed no significant

differences between them. Although the difference between the pre brushing and post brushing plaque scores was greater with brush A (zig-zag) (0.669 ± 0.24) as compared to brush B (flat- trim brush) (0.573 ± 0.41), the values were statistically insignificant.

Scully and Wade in 1970 found that hard-textured (0.33mm) brushes were more effective than medium textured tooth brushes (0.22mm) brushes with long heads.¹² Recently, Carvalho et al., in 2007 compared hard and soft filament tooth brushes and concluded that hard filament tooth brushes removed more plaque than soft filament tooth brush.¹³

CONCLUSION

There was better plaque control efficacy with Colgate Charcoal tooth brush as compared to Colgate sensitive tooth brush.

REFERENCES

1. Claydon NC. Current concepts in tooth brushing and interdental cleaning. *Periodontol.* 2000; 2008; 48:10-22.
2. Sharma NC, Qaqish J. A Clinical Evaluation of the Plaque Removal Efficacy of Five Manual Toothbrushes. *J Clin Dent* 2010; 21:8-12.
3. Nageshwar Iyer, Shalu Chandna, Ashish Loomba. Plaque removal efficacy of Colgate 360 toothbrush: A clinical study. *Contemp Clin Dent* 2016; 7:317-21.
4. Haruaki Hayasaki, Issei Saitoh, Kuniko Nakakura Ohshima, Mika Hanasaki, Yukiko Nogami, Tsutomu

- Nakajima et al. Tooth brushing for oral prophylaxis. *Japanese Dental Science Review* 2014; 50:69-77.
5. Hayashi H, et al. Tooth brushing for oral prophylaxis. *Jpn Dent Sci Rev.* 2014; 50:69-77.
6. Bergenholtz A, Gustafsson LB, Segerlund N, Hagberg C, Ostby N. Role of brushing technique and toothbrush design in plaque removal. *Scand J Dent Res.* 1984; 92:344-51.
7. Staudt CB, Kinzel S, Haßfeld S, Stein W, Staehle HJ, Dorfer CE. Computer based intraoral image analysis of the clinical plaque removing capacity of 3 manual toothbrushes. *J Clin Periodontol.* 2001; 28:746-752.
8. Claydon N, Addy M. Comparative single-use plaque removal by toothbrushes of different designs. *J Clin Periodontol.* 1996; 23:1112-1116.
9. Sharma NC, Goyal CR, Qaqish JG, Cugini MA, Thompson MC, Warren PR, et al. Single-use plaque removal efficacy of three power toothbrushes. *Journal of dent.* 2005; 33:11-15.
10. Gjermo P, Rösing CK, Susin C, Oppermann R. Periodontal diseases in Central and South America. *Periodontol* 2000. 2002; 29(1):70-8.
11. Muhammad Kashif. Efficacy of tooth brushes of different bristles design in plaque removal. *JUMDC.* 2015; 6:41-47.
12. Scully CM, Wade AB. The relative plaque removal effect of brushes of different length and texture. *Dent Pract Dent Rec.* 1970;20:244-8.
13. Carvalho Rde S, Rossi V, Weidlich P, Oppermann RV. Comparative analysis between hard and soft filament toothbrushes related to plaque removal and gingival abrasion: *J Clin Dent.* 2007;18:61-4.

Source of support: Nil

Conflict of interest: None declared

This work is licensed under CC BY: **Creative Commons Attribution 3.0 License.**