

PC-II-7. Evaluation of a Sonic Toothbrush on the Reduction of Clinical Parameters, Interleukin-1, MMP-8 and Periodontal Pathogens in Incipient to Moderate Periodontitis

Ho-Sun Yoo*, Ji-Youn Hong, Gyung-Joon Chae, Sung-Won Jung,
Yoo-Jung Um, Seong-Ho Choi, Chong-Kwan Kim

Department of Periodontology, College of Dentistry, Yonsei University

Background

Daily plaque removal with a toothbrush is an important component of most oral hygiene programs to prevent and treat periodontal diseases. The Sonicare® toothbrush utilizes solid-state electronics to create sonic-frequency bristle movement with 520 brush strokes per second. This rapid bristle movement, in addition to its scrubbing plaque-removing activity, creates dynamic activities in surrounding fluids. It has been suggested that these fluid forces lift and disperse plaque bacteria from tooth surfaces about 2–3 mm beyond the physical reach of the bristles. The aim of this study was to evaluate the effectiveness of the sonic toothbrush duration of 12 weeks on the reduction of the clinical parameters, Interleukin-1, MMP-8 quantitatively and Periodontal Pathogens in moderate periodontitis

Materials and methods

A 12-week, single-blind clinical trial was employed. Eighty two subjects, ages 25–55 years, were selected. Subjects with plaque index (PI) of >0.5, gingival index (GI) of >1.0 were randomly assigned to use either the manual or the Sonicare® Elite toothbrush, instructed in its use, and asked to brush each morning and evening for 2 minutes. Plaque index, gingival index, percentage of sites which bled on probing, pocket depth, loss of attachment level, Interleukin-1, MMP-8 and four Periodontal Pathogens (*Actinomyces viscosus*(AV), *Porphyromonas gingivalis*(PG), *Streptococcus sanguis*(SS), *Tannerella forsythensis*(TF)) in a subgingival plaque sample from 16S rRNA test were assessed at baseline and 1, 12 weeks from the selected teeth. Plaque score and gingival inflammatory score (GI) were taken at baseline and 1, 4, 12weeks using Silness & Løe gingival index, Løe & Silness plaque index, respectively. Gingival bleeding was assessed by the bleeding tendency score, presence or absence of bleeding on probing (BOP).

Results

The results demonstrate that both the Sonicare® elite brush and manual brush were significantly reduced all of the clinical parameters. However, statistics indicated Sonicare® was more effective than the manual brush in plaque and gingival Index scores reduction, respectively ($p < 0.001$). Reduction of BOP in the Sonicare® group (76.73%) was greater than manual group (44.57%). Reduction of Probing pocket depths compared to baseline were reduced in the Sonicare® group and the manual groups 18.55% and 14.81%, respectively. Clinical attachment level were significantly improved compared to baseline in the Sonicare® groups (25.24%) and the manual groups (16.94%) ($p < 0.001$). Concentration of IL-1 β and MMP-8 were decreased compared to baseline in both groups. AV, PG and TF in subgingival plaque samples did not show significantly decreased 12 weeks than the baseline both in Sonicare® and manual groups. SS showed significantly decreased 12 weeks than the baseline in Sonicare® but were not significantly reduced than baseline in manual group.

Conclusion

In conclusion, the tested Sonicare® toothbrush was more effective than the manual brush in removal plaque and reduction of gingival inflammation.