Plaque Reduction and Inflammation Control with a Ultrasonic Toothbrush

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OBJECTIVES

◆ The two major bacterial diseases of the oral cavity are dental caries and periodontal diseases.
◆ Most important tool of prevention: personal oral hygiene using toothbrushes and fluoride containing dentifrices.
◆ Long-lasting use of abrasive brushes and pastes can result in combined erosive-abrasive lesions of teeth and gums.

AIM

◆ To evaluate alternative bio-physical methods for non-abrasive reduction of bacterial biofilms on teeth.
◆ To assess plaque reduction and inflammation control with the Ultrasonic Toothbrush emmi®-dental Professional (EMAG Technologies®, Mörfelden-Walldorf, Germany) compared to low-abrasive tooth cleaning tablets Denticaps® (Innovative Zahnpflegegesellschaft mbH, Berlin, Germany).

METHODS

◆ 16 healthy subjects aged 20-34 years with at least 26-28 teeth, except the third molars
◆ Cross-over study design: 2x 28 days
◆ Professional meticulous tooth cleaning prior to the study
◆ Four-day-training with the assigned toothbrush
◆ Three-day-plaque-regrowth
◆ Modified Navy-Plaque-Index (Lang et al. 2011), intraoral planimetric photography at baseline, after three minutes supervised brushing, and after seven and 21 days
◆ Löe and Silness gingival index (GI) was recorded at baseline, after seven and 21 days
◆ Eight days wash-out period
◆ Four training days and three-day plaque-regrowth
◆ Ethical committee approval number 35/2010

RESULTS and DISCUSSION

◆ The emmi®-dental Professional ultrasonic toothbrush demonstrated in comparison with the manual toothbrush Denttabs® an equally well pronounced reduction of plaque after four training days and three-day plaque-regrowth period in all 16 subjects.
◆ The plaque reduction on all sites of teeth after one single tooth-brushing was more than 20% compared to non-cleaned teeth.
◆ The area free of plaque was kept by 45% during follow-up for seven and 21 days.

◆ The plaque reduction with both brushes was better at the front teeth compared to the posterior teeth.
◆ Maxillary and mandibular teeth were equally well cleaned.
◆ The assessment of plaque control along the gum line and between the teeth demonstrated a clear reduction of plaque.
◆ Extremely low scores of GI over the whole study period for both toothbrushes indicated that most sites were free of inflammation.

◆ Unique results of an exclusively ultrasound activated powered toothbrush. According to the Cochrane Reviews of 2009 and 2010 ultrasound toothbrushes tested so far were combined sound-ultrasound models.
◆ Most important advantage: non-abrasive movement over the tooth groups to exclude any abrasive risk for teeth and gums when in permanent use.

CONCLUSIONS

◆ The tested exclusively ultrasound-activated toothbrush emmi®-dental Professional is as effective in plaque reduction as a manual toothbrush.
◆ The ultrasonic toothbrush contributes to gingival health and avoids completely abrasive brush movements.
◆ The risk of abrasive lesions on teeth and gums is excluded.