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study

Tooth-brushing: how frequent should it be for the periodontal patient?

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Background

Plaque-induced gingivitis is defined as an inflammatory lesion confined to the marginal gingival tissues which appears because of the presence of microbial plaque and the activation of the local host immune response. Although not all gingivitis cases advance to periodontitis, the management of gingivitis appears to be a primary goal in the prevention of periodontitis.

The main strategy in preventing the occurrence of gingivitis is establishing an effective oral-hygiene routine by maintaining a regular disruption of dental plaque through self-performed mechanical plaque control (SPC).

Recent studies have shown that personal oral hygiene performed at 12- or 24-hour intervals is compatible with gingival health. Nevertheless, there is no evidence in the literature regarding the efficacy of the SPC interval on gingival health in subjects with a history of periodontitis who participate in a periodic periodontal maintenance programme.

It thus appears important to establish SPC guidelines that result in gingival health in subjects susceptible to periodontitis, as it is known that sites consistently presenting with gingival bleeding represent an elevated risk for disease recurrence and therefore possible tooth loss.
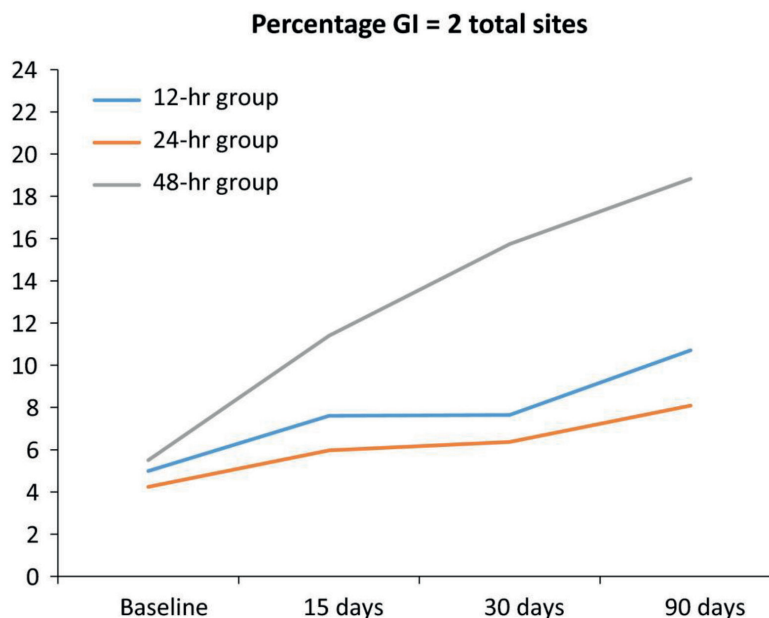
Aims

The aim of the present randomised controlled trial (RCT) was to evaluate the effect of SPC frequency on the maintenance of gingival health in subjects with a history of periodontitis.

Materials & methods

• The study was a single-masked, parallel-design, three-arm RCT.

• Qualification criteria were:
   • 35 years or older.
   • At least 12 teeth.
   • Gingival index (GI) = $2 \leq 7.5\%$ and BoP $\leq 25\%$.
   • Non-smokers, non-pregnant, and non-diabetic.
   • Without xerostomia or psychomotor disorders.
   • No fixed orthodontic appliances.
   • No antibiotic/anti-inflammatory drugs within the previous three months or need for antimicrobial prophylaxis or medication associated with gingival enlargement.

• The study included 42 patients – 14 subjects per group.

• Subjects were randomized into three groups, conducting SPC at 12-, 24-, or 48-hour intervals.

• Study subjects were interviewed and received oral prophylaxis at baseline.

• Each subject received a kit for SPC.

• All study subjects were instructed to use mouth wash three times a day to provide oral comfort and support compliance.

• Professional periodontal maintenance procedures were not performed during the study but were re-established once it ended.

• Clinical parameters were evaluated at six sites per tooth, including all teeth except third molars.

• Clinical parameters recorded at baseline and at days 15, 30, and 90 were plaque index (PI) and gingival index (GI).

• Clinical parameters recorded at baseline and at days 30 and 90 were probing depth (PD), clinical attachment level (CAL), and bleeding on probing (BoP).

• Clinical examination was preformed prior to SPC.

• Study subjects received a questionnaire concerning potential adverse events relating to the trial at the examinations on days 30 and 90.

Figure:

Percentage total sites with GI = 2 by SPC interval over the experimental period.

Percentage GI = 2 total sites

Legend: 12-hr group, 24-hr group, 48-hr group. X-axis: Baseline, 15 days, 30 days, 90 days. Y-axis: 0 to 24.

Results

- Out of 42 subjects that were randomised into the three SPC groups, four did not complete the study.

- At baseline, no significant sociodemographic, behavioural, or clinical-periodontal (PD, BoP, CAL, PI) differences were noted between the groups.

- The 12-hour group and the 24-hour group showed a significant change in GI at the 30- and 90-day examinations compared to baseline.

- The 48-hour group showed an increase in GI during the entire study, including significant changes between baseline and 15 days.

- Significant changes in mean GI over the 90 days of the trial were observed between the 12- and the 48-hour groups, and between the 24- and 48-hour groups.

- The 48-hour group had a higher percentage of patients with GI=2 at day 90 compared to the other groups.

- The pattern of sites with GI=2 was similar in all groups.

- At 90 days, the 48-hour group showed an increase in mean PI compared to the 12- and 24-hour groups.

- The increase in PI happened during the first 15 days and remained stable in the 12- and 24-hour groups. In the 48-hour group, PI continued to increase over the 90 days.

- By the end of the study, there were no significant differences in CAL and PD between the groups.

Limitations

- Assessing compliance and adherence to the study protocol is difficult in this type of RCT setting. Measuring the weight of dentifrice tubes is an unreliable measurement of subject compliance.

- Baseline parameters regarding the use of inter-dental devices was not standardised between the groups, with half of the patients in 48-hour group using dental floss compared to 14% in the 12-hour group, and no patients in the 24-hour group.

- There were no BoP percentage results over time, which makes the gingival index used in this study irrelevant to the new classification of periodontal and peri-implant diseases' conditions for defining periodontal health (Lang & Bartold, 2018).

- The study population includes only subjects with a history of periodontitis and with high oral-hygiene standards, thus the conclusions should be implemented with caution in relation to patients with average or low oral-hygiene standards.

Conclusions & impact

- Self-performed mechanical plaque control at 12- or 24-hour intervals along with consistent periodontal maintenance visits demonstrates stable levels of gingival health in patients susceptible to periodontitis.

- Self-performed mechanical plaque control at 48-hour intervals exhibited twice as many sites with gingival inflammation and bleeding.

- The same pattern was seen with twice as much gingival inflammation/bleeding sites detected in either buccal/lingual and interproximal sites in the 48-hour group.

- Increased gingival inflammation in the 48-hour group correlates with higher plaque levels compared to the 12- and 24-hour groups.

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