

**ARTICLE TITLE AND  
BIBLIOGRAPHIC  
INFORMATION**

Effect of smoking cessation on non-surgical periodontal therapy: results after 24 months.

Rosa EF, Corraini P, Inoue G, Gomes EF, Guglielmetti MR, Sanda SR, Lotufo JPB, Romito GA, Pannuti CM.

*J Clin Periodontol* 2014;41(12):1145–53.

**REVIEWER**

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**PURPOSE/QUESTION**

To assess the adjunctive effect of smoking cessation in non-surgical therapy of smoking subjects with severe chronic periodontitis

**SOURCE OF FUNDING**

Government: São Paulo Research Foundation (FAPESP) Grant 07/54494-3

**TYPE OF STUDY/DESIGN**

“Quasi-Experimental” clinical trial (non-randomized clinical trial)

**LEVEL OF EVIDENCE**

Level 2: Limited-quality, patient-oriented evidence

**STRENGTH OF  
RECOMMENDATION GRADE**

Not applicable

**Smoking Cessation May Promote  
Additional Benefits to Non-Surgical  
Periodontal Therapy in Adults With  
Chronic Periodontitis****SUMMARY****Subjects**

Between May 2007 and October 2010, 116 subjects who sought treatment in the Smoking Cessation Clinic at the University Hospital in São Paulo were included in the study. To be eligible, patients had to be willing to quit smoking, retain at least 10 teeth, and have a proximal clinical attachment level (CAL) of at least 5 mm in 30% or more of their teeth. Smoking cessation therapy (SCT) consisted of four consecutive 1-h lectures (once a week) offering counseling, cognitive behavioral therapy, and nicotine replacement and/or pharmacotherapy (bupropion or varenicline), according to individual needs. Exhaled carbon monoxide (CO) measurements were used to determine the efficacy of SCT. Nonsurgical periodontal treatment consisted of supra- and subgingival scaling using manual and ultrasonic devices that was performed concomitantly with SCT by specialists. A tri-monthly interval maintenance program was provided to all participants. Subjects were re-examined after 3, 12, and 24 months. Although all patients received SCT, not all of them succeeded in quitting smoking. The subjects were then classified as quitters (subjects who stopped smoking up to 6 months after periodontal therapy), non-quitters (those who did not stop smoking at any time), and oscillators (those stopped smoking and started again). The mean age of the participants was  $48.2 \pm 8.4$  years at baseline, and the sample consisted of mostly of women ( $n = 38$ ) of low socio-economic status.

**Key Exposure/Study Factor**

The key study factor was the impact of smoking cessation (SCT) on nonsurgical periodontal therapy in chronic periodontitis patients. A trained and calibrated examiner conducted all examinations. Attempts to blind the examiner to smoking status were made. All patients received stain removal/dental polishing and a 0.12% chlorhexidine rinse before the examination to mask the cigarette odor. Quitters were compared with oscillators and non-quitters regarding periodontal clinical parameters, including CAL, probing depth (PD), percentage of sites with visible plaque (VP), and bleeding on probing (BoP).

**Main Outcome Measure**

Authors did not previously define the primary and secondary outcomes. Frequency distributions of CAL, PD, percent of sites with VP, and percent of sites with BoP were given at 3, 12, and 24 months. Multilevel linear analysis also compared groups with respect to CAL and PD differences (baseline values subtracted from the follow-up value) in diseased sites ( $CAL_{dif PD \geq 4 mm}$  and  $PD_{dif PD \geq 4 mm}$ ), proportion of sites with CAL gain ( $\%CAL_{\geq 2 mm}$  and  $\%CAL_{\geq 3 mm}$ ), and proportion of sites with PD

reduction ( $\%PD_{red \geq 2 \text{ mm}}$  and  $\%PD_{red \geq 3 \text{ mm}}$ ). Missing data were imputed through the last value carried forward method.

### Main Results

After 24 months, approximately half of subjects ( $n = 55$ ) were lost to follow-up. The 61 remaining patients formed three dynamic groups. In the last visit 18 had quit smoking, 32 continued smoking, and 11 oscillated. Quitters presented significantly higher mean CAL gain in diseased sites ( $CAL_{dif \text{ PD} \geq 4 \text{ mm}} = 0.4 \text{ mm}$ ) and higher mean PD reduction ( $PD_{dif \text{ PD} \geq 4 \text{ mm}} = 0.4 \text{ mm}$ ) relative to non-quitters ( $p \leq 0.05$ ). The results were observed after 3 months of follow-up and remained for up to 24 months of follow-up.

### Conclusions

Quitters presented slightly better results in terms of CAL gain and PD reduction in disease sites ( $PD \geq 4 \text{ mm}$ ) than non-quitters.

## COMMENTARY AND ANALYSIS

The importance of this study is based on the choice of the issue approached by the authors. Although a substantial literature reports the effect of smoking on periodontal tissues and periodontal treatment, very few studies address the impact of smoking cessation on periodontal therapy results. Actually, there are only two previous studies that prospectively investigated this topic in the literature,<sup>1,2</sup> with one presenting the 1-year follow-up results of this same cohort.<sup>2</sup> The article is well designed, and although some limitations are present, its results have impact on daily clinical practice of periodontists.

The study describes the largest sample and the longest follow-up so far existing in the literature. Compared to the 1-year follow-up report,<sup>2</sup> results remain similar, with slight benefits in terms of CAL gain and PD reduction for quitters.

An important aspect that should be emphasized is the high smoking cessation rate obtained (approximately 35%). The multidisciplinary approach and the periodic re-motivation/counseling probably influenced these results, since even non-quitters and oscillators significantly decreased the number of cigarettes smoked over 24 months. Considering the “common risk factor approach,” all the patients had benefits at the end of the study, not only for their oral health, but also for several other chronic diseases affected by cigarette smoking.

The development of scientific knowledge is slow and sometimes tricky. In this case, a randomized controlled trial could not be done because of ethical considerations. Therefore all patients who seek treatment in the Smoking Cessation Clinic at the University Hospital in São Paulo were included. As expected, the dropout rate was high (up to 47%). In addition, the psychological profile of patients was unstable, probably related to the abstinence syndrome, leading to low levels of compliance. These findings, although disappointing, are frequently reported in the literature addressing SCT.

The major limitation of the study was the oral hygiene pattern of participants. High plaque levels and a high percentage of supragingival calculus were observed throughout the study among the three groups, and quitters presented more than 90% of visible plaque and more than 75% of supragingival calculus at the 24-month follow-up examination. This poor result, associated with the gingival inflammatory response of quitting smoking, may have directly impacted the PD results, avoiding greater differences between quitters and non-quitters.

In conclusion, taken together, the results of the literature addressing the impact of SCT on periodontal treatment demonstrates an additional benefit of quitting smoking of at least slight to moderate magnitude.<sup>3</sup> Although conclusive statements still cannot be made, the results of the present study put another piece in the puzzle of building a foundation of scientific evidence. The clinical implications for dental staff include considering SCT for their patients.

## REFERENCES

1. Preshaw PM, Heasman L, Stacey F, Steen N, McCracken GI, Heasman PA. The effect of quitting smoking on chronic periodontitis. *J Clin Periodontol* 2005;32(8):869-79.
2. Rosa EF, Corraini P, de Carvalho VF, et al. A prospective 12-month study of the effect of smoking cessation on periodontal clinical parameters. *J Clin Periodontol* 2011;38(6):562-71.
3. Fiorini T, Musskopf ML, Oppermann RV, Susin C. Is there a positive effect of smoking cessation on periodontal health? A systematic review. *J Periodontol* 2014;85:83-91.

## REVIEWER

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