A systematic review on the clinical efficacy of subgingival debridement in the treatment of chronic periodontitis

Van der Weijden G A, Timmerman M F

Authors' objectives
To assess the effect of subgingival debridement (SGD) in patients with chronic periodontitis.

Searching
MEDLINE and the Cochrane Oral Health Group's Trials Register were searched to 2001 for reports published in the English language; the search terms were stated.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs), controlled clinical trials and uncontrolled studies were eligible for inclusion if they lasted more than 3 months. Case reports, letters and historical reviews were excluded. Studies with two treatment groups and which indicated that the outcome assessor was not blinded were excluded, as were studies in which the clinical and the outcome assessor were the same person. Studies were excluded if they randomised parts of mouths in studies, compared local antibiotics plus SGD with no antimicrobial control sites, or were parallel-group studies that used placebo subgingival placement as the control.

Specific interventions included in the review
Studies of SGD were eligible for inclusion. Studies were included if they mentioned SGD alone, SGD plus oral hygiene, or SGD plus oral hygiene instructions plus supragingival scaling. The included controlled studies used no treatment or subgingival plaque control (SPC) alone as a control treatment. The duration of the treatments varied considerably, from one session to 8 hours.

Participants included in the review
Studies of otherwise healthy patients with chronic periodontitis were eligible for inclusion if the patients had not received systemic medication or periodontal treatment within the last 6 months. Initially, only patients aged older than 35 years were to be included, but this criterion was abandoned in view of the problems of selecting such patients from studies of mixed-age populations. The included studies were mostly of patients with moderate to advanced periodontitis.

Outcomes assessed in the review
Studies that assessed clinical outcomes for at least two sites were eligible for inclusion. The primary outcome in the review was probing attachment level. The secondary outcomes were changes in pocket depth and bleeding on probing.

How were decisions on the relevance of primary studies made?
Two reviewers screened titles and abstracts according to seven specified criteria, and resolved any disagreements on relevance through discussion. Full texts were obtained of studies with titles suggesting the use of any form of supra and subgingival debridement. Two reviewers independently made the final selection of studies from full publications using 17 specified criteria. Agreement for both stages of the study selection process was assessed using the kappa statistic.

Assessment of study quality
The reviewers assessed validity on the basis of adequacy of the method of randomisation, allocation concealment, blinding of the outcome assessors, and completeness of follow-up. The authors did not state how the validity assessment was performed.
Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

Data were extracted for the longest follow-up period up to 1 year. Means and standard deviations were extracted for plaque index, bleeding on probing, probing pocket depth (PPD) and clinical attachment level (CAL) for studies reporting follow-up ranging from 3 months to 1 year. For controlled studies, the authors calculated the difference in PPD and CAL between SGD and SPC, or SGD and no treatment.

Methods of synthesis
How were the studies combined?
The studies were grouped into four categories: controlled trials of SGD that presented details about pockets 5mm or more PPD at baseline; studies comparing SGD with control, but with no details about baseline pocket depth; single arms of controlled trials, including split-mouth studies and cohort studies that compared SGD on packets with baseline depth 4 mm or more; studies of SGD, but no information about baseline pocket depth. Information was presented in tabular format. The studies were pooled in a meta-analysis for attachment gain and pocket depth reduction, using a fixed-effect method weighted according to the standard error.

Weighted means were calculated for three groups of studies: controlled studies comparing SGD with SPC or no treatment; longitudinal studies comparing change in CAL and PPD from baseline; and studies with a SGD treatment group only and no information on baseline pocket depth.

How were differences between studies investigated?
Differences between the studies were discussed with respect to duration of treatment, variation in pocket depth and severity of periodontal disease.

Results of the review
Twenty-six papers were included. These reported 10 non-randomised controlled studies that compared SGD with SPC or no treatment (777 patients), and 18 longitudinal studies without a control group.

Only two reports described the method of randomisation and none of the reports gave details of allocation concealment. More than 50% of the studies reported the number of patients at baseline and follow-up, but only 8 studies analysed data taking drop-outs into consideration. The studies did not always describe the method or instruments used for SGD.

No RCTs that assessed the effect of SGD on clinical outcomes were identified.

Four of the 10 non-randomised controlled studies assessing clinical outcomes showed that SGD was more effective than the control. One study (that did not include instruction in oral hygiene) showed that SGD was less effective than control. One study showed no effect of SGD. The results from the remaining studies were unclear. The pooled data from 4 studies (mentioned in two reports) found the weighted mean attachment gain for pockets 5 mm or more at baseline was 0.64 mm with SGD, compared with 0.37 mm for SPC alone. SGD reduced pocket depth by 1.18 mm compared with 0.59 for SPC alone.

Longitudinal studies with no control group: 8 of the 18 studies showed that SGD improved CAL compared with baseline; the pooled data from 6 studies showed the weighted mean gain was 0.74 mm for pockets 4 mm or more at baseline. Twelve of the 18 studies showed that SGD improved PPD; the other studies did not present adequate data for analysis.

Studies with a SGD treatment group only and no information on baseline pocket depth: the pooled data from 2 studies showed that SGD improved CAL by 0.22 mm compared with baseline.

Authors' conclusions
SGD plus SPC reduced pocket depth and improved clinical attachment level compared with SPC alone.
**CRD commentary**

The review question initially appeared to be clear in terms of the study design, intervention, participants and outcomes, but inclusion and exclusion criteria were amended during the review process. Searching only two databases for studies published in the English language may have resulted in the omission of some relevant studies. No attempt to locate unpublished studies was made, thus raising the possibility of publication bias. Two reviewers independently selected the studies, which reduces the potential for bias and errors. However, the methods used to assess validity and extract the data were not described; hence, any efforts made to reduce errors and bias cannot be judged. Validity was assessed using criteria generally used for RCTs, but most of the included studies were longitudinal in design, hence these criteria were not appropriate for the majority of the studies.

Some relevant information on the included studies was presented in tabular format, but the study design was not always clear. The initially stated inclusion criteria were not adhered to and, therefore, few studies provided data suitable for analysis. The studies were combined in a meta-analysis, but no assessment of statistical heterogeneity or statistically significant differences between treatments was undertaken. In light of the methodological flaws in the review, the authors' conclusions should not be viewed as robust.

**Implications of the review for practice and research**

**Practice:** The authors stated that SGD plus SPC is an effective treatment for patients with periodontal disease.

**Research:** The authors stated that that reports of research should adhere to the CONSORT guidelines (see Web Address at end of abstract). They also stated that research analysing subgroups according to initial pocket depth will allow an assessment of the effect of treatment on shallow, moderate and deep pockets. Future research should include multiple sites for each patient.

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