Use of chlorhexidine varnishes in preventing and treating periodontal disease: a review of the literature

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CRD summary
The authors concluded that chlorhexidine varnish may be of benefit for chronic gingivitis and that high-concentration varnish may help reduce pocket depth following scaling and root planing for chronic periodontitis. Poor reporting of review methods and failure to assess study validity or quantify effect sizes meant that the conclusions may need to be regarded with caution.

Authors' objectives
To evaluate the effectiveness of chlorhexidine varnishes for preventing and treating periodontal disease.

Searching
PubMed, EMBASE and The Cochrane Library were searched in June 2007. Search terms were reported.

Study selection
Controlled clinical trials of chlorhexidine for the treatment of gingivitis and periodontitis were eligible for inclusion. Studies were required to report clinical outcomes. The authors excluded studies of chlorhexidine mouth rinse or gel, studies that used preventative interventions in addition to chlorhexidine (for example, fluoride varnishes), studies that reported only bacterial or biochemical outcomes and studies with small sample sizes (not further defined).

Patient populations in the review varied widely and included adolescents, young adults (some intellectually disabled) and older adults with either gingivitis or chronic periodontitis. The age range was 10 to 93 years. The studies used a wide variety of chlorhexidine varnishes, with chlorhexidine concentration ranging from 1 per cent to 40 per cent. In most studies the varnish was applied on a single occasion, but in some cases applications were repeated. For treatment of periodontitis the varnish was used as an adjunct to scaling and root planing. Controls received no varnish or placebo. Outcomes reported in the review were periodontal pocket depth, indices of plaque, bleeding and gingival health (for example, the Loe and Silness gingival index) and microbiological measures. In most studies outcomes were assessed on two to four occasions. Duration of follow up varied from six weeks to nine months.

The authors stated neither how the papers were selected for the review nor how many reviewers performed the selection process.

Assessment of study quality
The authors did not state that they assessed validity, but they noted the level of blinding.

Data extraction
Descriptive data were reported. The authors stated neither how the data were extracted for the review nor how many reviewers performed the data extraction.

Methods of synthesis
Studies were combined in a narrative synthesis organised by clinical indication.

Results of the review
Nine randomised controlled trials (RCTs) were included in the review (n=347). Four were placebo-controlled, one using a split-sample design. Six studies were double blinded, two were single blinded and one did not describe the type of blinding used.

Chlorhexidine varnish versus controls
Treatment of gingivitis (four RCTs): One RCT (using 1.6% chlorhexidine varnish) showed a significant drop in the plaque index in the intervention group for up to eight weeks, but no difference in the gingival index. A second RCT
(using 40% varnish) showed a reduction in plaque and bleeding indices in the intervention group plus a reduction in bacterial colonisation. A third RCT (using 10% varnish) reported improvements in the gingival index among adolescents in the intervention group for up to six months. The fourth RCT (using 1% varnish) found no significant difference between the groups in any plaque and bleeding outcomes over six-month follow up.

Adjunctive treatment of chronic periodontitis (five RCTs): A split-sample RCT (using 1% chlorhexidine varnish) reported increased plaque in areas treated with placebo, but no significant difference between intervention and placebo areas in bleeding, pocket depth recession or microbiological measures. Four RCTs (using 40% varnish and all conducted by the same research group) reported improvements in pocket depth in both groups, but a greater improvement in the intervention group with additional reductions averaging between 0.62mm and 0.73mm. The greatest improvements were seen in the deepest pockets.

**Authors' conclusions**
Chlorhexidine varnish may be of benefit for chronic gingivitis, with prolonged effects if varnish is reapplied. High concentration varnish may help reduce pocket depth following scaling and root planing for chronic periodontitis.

**CRD commentary**
The objectives and inclusion criteria of the review were clear in most respects, although the review was restricted to treatment studies when the objective suggested that prophylaxis was also of interest. Relevant sources were searched, though it was not stated whether there was any restriction by language or publication status. It was unclear whether steps were taken to reduce the risk of error and bias by having more than one reviewer independently undertake study selection and data extraction. It did not appear that study validity was systematically assessed, which made it difficult to evaluate the reliability of the results presented. The decision to combine the studies by narrative synthesis appeared appropriate given the heterogeneity between them. However, little indication of the statistical or clinical significance of the findings was provided and it was not clear in all cases whether findings resulted from between-group comparisons or changes from baseline. In view of the poor reporting of review methods and failure to assess study validity or quantify effect sizes, the authors' conclusions may need to be regarded with caution.

**Implications of the review for practice and research**
Practice: The authors did not state any implications for practice.

Research: The authors stated that more research was needed on the use of chlorhexidine varnish for periodontal disease to establish its long-term effects and the optimum number and frequency of applications.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.