Does oral health promotion influence the oral hygiene and gingival health of patients undergoing fixed appliance orthodontic treatment? A systematic literature review

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CRD summary
This review concluded that an oral hygiene programme for patients who underwent fixed appliance orthodontic treatment produced a short-term (up to five months) reduction in plaque and an improvement in gingival health, but no particular method was best. Most of the review's conduct was good, but a lack of detail about the results undermined the reliability of the conclusions.

Authors' objectives
To review the effectiveness of oral health promotion interventions for improving oral hygiene and gingival health in patients undergoing orthodontic fixed appliance treatment.

Searching
MEDLINE and EMBASE (inception to May 2005) and Cochrane Central Register of Controlled Trials (CENTRAL) (January 2005) were searched; search terms were reported. Handsearches of four orthodontic journals, a grey literature search (Google scholar) and searches of reference lists were conducted. There were no language restrictions.

Study selection
Randomised controlled (RCTs) and quasi-randomised clinical trials (CCTs) that evaluated health promotion interventions in patients who underwent orthodontic treatment with fixed appliances and that measured reductions in dental plaque levels and/or gingival bleeding were eligible for inclusion. Trials of plaque removal by a professional or use of proprietary antiplaque agents were excluded.

Included studies evaluated a range of educational interventions; one study assessed an environmental change. Study duration ranged from eight weeks to 10 months. Outcome measures included plaque index, gingival index, orthodontic patient cooperation scale, oral and modified oral hygiene index and flow of gingival exudate.

The authors did not state how many reviewers performed the study selection.

Assessment of study quality
The authors assessed allocation concealment, blinding of outcome assessors and reporting of withdrawals. This formed part of the data extraction, which was performed independently by two reviewers with consensus achieved through discussion.

Data extraction
Data were extracted by two reviewers independently using a specially designed form. Results were presented as positive or negative effects with p-values. There was no information on the definition of a positive or negative effect.

Methods of synthesis
Results were presented in a narrative synthesis.

Results of the review
Four RCTs (n=unclear) and two CCTs (n=38 and 59) were included. Study quality was variable. No trials described allocation concealment. Three trials reported blinding of the outcome assessor. Two trials reported withdrawal rates.

An oral hygiene programme showed positive effects on plaque and/or gingival health in four of the six studies. The other two studies reported no difference between groups. In the short-term (up to five months) significant reductions in plaque levels were reported after an oral hygiene programme in four trials (p<0.05). As the two other studies failed to find any improvement, it was not possible to compare an educational intervention to an environmental change.
Authors' conclusions
An oral hygiene programme for patients who underwent fixed appliance orthodontic treatment produced a short-term (up to five months) reduction in plaque and an improvement in gingival health. No particular method produced a greater short-term benefit.

CRD commentary
This review had a clearly stated research question that specified the intervention, participants and outcomes. Study inclusion criteria were specified. The search covered a number of relevant databases and made efforts to obtain further studies by searching grey literature and relevant journals. Language bias was unlikely to be a problem as there were no language restrictions. Data extraction (which included a validity assessment) was performed by two reviewers independently; it was not reported whether studies were selected in the same way. Only a brief narrative summary of the results was presented and no effect sizes were reported or included as tables or plots. Results were described as positive or negative, but no further details were given. The lack of detail about the results undermined the reliability of the author's conclusions.

Implications of the review for practice and research
Practice: The authors stated that patients with planned fixed appliance treatment should be provided with orthodontic oral hygiene programme material at the start of treatment and direct advice from an oral health professional backed up by written and, where possible, video evidence. Other recommendations for treatment to minimise plaque build up around the fixed appliance were given in the paper.

Research: The authors stated that studies that used appropriate methods and with longer follow-up periods were needed.

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