The efficacy of oral irrigation in addition to a toothbrush on plaque and the clinical parameters of periodontal inflammation: a systematic review

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CRD summary
This review concluded that oral water irrigation did not appear to have a beneficial effect on reducing plaque scores, although there was evidence to favour irrigation over regular oral hygiene in terms of improved gingival health. These conclusions would appear reliable given the evidence presented, but there may be relevant evidence that was missed by this review.

Authors' objectives
To evaluate the effectiveness of oral water irrigation as an adjunct to toothbrushing on plaque and periodontal inflammation, compared to toothbrushing alone or regular oral hygiene.

Searching
The databases MEDLINE and the Cochrane Central Register of Controlled Trials were searched from 1965 to January 2008 for relevant English language publications. Search terms were reported. The reference lists of selected articles were also searched to identify any further relevant studies.

Study selection
Randomised controlled trials (RCTs) and non-randomised controlled studies comparing supragingival use of oral water irrigation as an adjunct to toothbrushing, or regular oral hygiene with toothbrushing alone, or regular oral hygiene, in adults in good general health were eligible for inclusion. Included studies were required to be of at least four weeks duration. Eligible studies had to report the outcomes of interest, which were plaque, bleeding, gingivitis, or pocket depth. Studies using orthodontic appliances or subgingival irrigation tips were excluded.

A range of irrigation devices were evaluated, irrigating with 500ml or 600ml of water, once or twice per day, where reported. A range of different indices were used to measure plaque, bleeding and gingivitis. Where reported, participants were aged from 18 to 75 years. Periodontal status of included participants varied across studies, including those with healthy tissue, periodontitis in a maintenance care phase, bleeding on probing, and those with a gingival index greater than one at a minimum number of sites.

Two reviewers independently screened studies for inclusion, with any disagreements resolved by discussion.

Assessment of study quality
The validity of included studies was assessed according to four criteria: method of randomisation, blinding of examiners, number of participants lost to follow-up and reported outcomes.

The authors did not state how many reviewers performed the assessment.

Data extraction
Mean values and standard deviations were extracted from the included studies. Where only standard error values were reported, standard deviations were calculated based on study sample size.

The data extraction was undertaken by three reviewers.

Methods of synthesis
Studies were combined in a narrative synthesis, incorporating a discussion of clinical and methodological heterogeneity among the included studies.
Results of the review
A total of seven studies (n=590 participants) were included in the review. Six studies were randomised controlled trials (RCTs) and one was a non-randomised controlled study. Five of the RCTs reported blinding of examiners. Across all studies, length of follow-up ranged from eight weeks to seven months.

Oral irrigation versus toothbrushing alone: Neither of the two studies reporting plaque and bleeding scores reported any significant difference between treatment groups. Similarly, the one study reporting gingival score reported no significant difference.

Oral irrigation versus regular oral hygiene: Of the four studies reporting plaque scores, none reported a significant difference between treatment groups. However, three of these four studies reported a significant difference on gingival score, favouring irrigation. All three studies reporting bleeding scores significantly favoured irrigation over regular oral hygiene on this outcome. Two of these studies also reported a positive statistically significant effect on pocket depth.

Authors’ conclusions
The evidence suggested that oral water irrigation did not have a beneficial effect on reducing plaque scores, although there was evidence to favour irrigation over regular oral hygiene in terms of improved gingival health.

CRD commentary
This review was based on a clear question, defined in terms of the participants, interventions, comparators, outcomes and study designs of interest. The authors took into account some aspects of study validity, and given the apparent clinical heterogeneity, appropriately chose to combine these studies in a narrative synthesis. The search for studies was limited to English language publications from two electronic databases and article reference lists, so there was potential for language and publications biases. However, given that the majority of included studies were both manufacturer-funded and yet reported null results may mitigate this concern somewhat. The authors’ conclusions would appear reliable given the evidence presented, but there may potentially be relevant evidence that was missed by this review.

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

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