Ozone therapy for the treatment of dental caries

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Authors' objectives

Background: Dental caries is a bacterially mediated disease characterised by demineralisation of the tooth surface, which may lead to cavitation, discomfort, pain and eventual tooth loss. Ozone is toxic to certain bacteria in vitro and it has been suggested that delivering ozone into a carious lesion might reduce the number of cariogenic bacteria. This possibly could arrest the progress of the lesion and may, in the presence of fluoride, allow remineralisation to occur. This may in turn delay or prevent the need for traditional dental conservation by 'drilling and filling'.

Objectives:
To assess whether ozone is effective in arresting or reversing the progression of dental caries.

Search methods: We searched the Cochrane Oral Health Group's Trials Register (to 7 November 2003); Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2003, Issue 3); MEDLINE and PREMEDLINE (OVID) (1966 to November 2003); EMBASE (OVID) (1980 to November 2003); CINAHL (OVID) (1982 to November 2003); AMED (OVID) (1985 to November 2003). Quintessence was handsearched through 2002 and KaVo were contacted as manufacturers of the HealOzone apparatus for any additional published or unpublished trials.

Selection criteria:
Inclusion was assessed independently by at least two reviewers. Trials were only included if they met the following criteria: randomisation in a controlled trial; single surface in vivo carious lesion accessible to ozone application; clear allocation concealment; ozone application to the lesions in the intervention group; no such application of ozone in the control group; outcomes measured after at least 6 months.

Data collection and analysis: Reviewers independently extracted information in duplicate. A paucity of comparable data did not allow meta-analytic pooling of the included studies.

Main results: Three trials were included, with a combined total of 432 randomised lesions (137 participants).

Forty-two conference papers, abstracts and posters were excluded (from an unknown number of studies). The risk of bias in all studies appeared high. The analyses of all three studies were conducted at the level of the lesion, which is not independent of the person, for this reason pooling of data was not appropriate or attempted. Individual studies showed inconsistent effects of ozone on caries, across different measures of caries progression or regression. Few secondary outcomes were reported, but one trial reported an absence of adverse events.

Authors' conclusions: Given the high risk of bias in the available studies and lack of consistency between different outcome measures, there is no reliable evidence that application of ozone gas to the surface of decayed teeth stops or reverses the decay process. There is a fundamental need for more evidence of appropriate rigour and quality before the use of ozone can be accepted into mainstream primary dental care or can be considered a viable alternative to current methods for the management and treatment of dental caries.


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