Systematic review of autoinflation for treatment of glue ear in children

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Authors' objectives
To assess the effectiveness of autoinflation for treatment of glue ear in children.

Searching
The authors searched the MEDLINE database and the Cochrane Library using the search terms 'otitis media', 'autoinflation', 'auto-inflation', 'valsalva' and 'politzer'.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs). None of the trials were blinded and length of treatment ranged from 2 to 12 weeks.

Specific interventions included in the review
Intervention groups underwent autoinflation of the middle ear (by blowing up a balloon with the nose which raises intracranial pressure) using mechanical aids (a modified anaesthetic mask (1 trial), toy balloons (2 trials) and manufactured nasal balloons (3 trials)). All controls had myringotomy and suction of the middle ear at commencement of trial.

Participants included in the review
Children aged between 3 and 18 years diagnosed with glue ear. In one unpublished study all the subjects in that trial underwent myringotomy. Children were excluded if they had any craniofacial abnormality, had had tonsillectomy or adenoidectomy, or had previously had tympanostomy tubes.

Outcomes assessed in the review
For included studies, recovery and absence of effusion were reported in 2 trials, typanograms (2 trials) and improvement in hearing (2 trials). No a-priori outcome measures were reported.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the authors performed the selection.

Assessment of study quality
No formal assessment method was used, however the authors critiqued the included studies with respect to the adequacy of outcome measurements used, how results were analysed and presented, and how studies were blinded.

Data extraction
The authors do not state who, or how many of the authors, performed the data extraction. data were extracted for the categories of study identification, type of intervention and regimen of intervention, participant characteristics (age and condition treated), method of randomisation, and outcomes (unit of analysis and measurement of the outcome). The authors also extracted information for comparison of the categories of: method of autoinflation, selection criteria for subjects, presence of unilateral or bilateral glue ear, length of treatment range, and level of data analysis (patient versus ear).

Methods of synthesis
How were the studies combined?
Pooled odds ratios and 95% confidence intervals (CIs) were calculated for the 6 trials using the Mantel-Haenszel fixed-effect model.

How were differences between studies investigated?
The authors used the Q statistic to test for heterogeneity.

**Results of the review**
Six RCTs were included in the review with 298 participants in the treatment group and 291 participants in the control group.

For all studies combined, the OR for improvement with autoinflation was 1.85 (95% CI: 1.22, 2.8; p = 0.0038) which was statistically significant. Heterogeneity was found between the six trials (Q = 16.44, df = 5, p = 0.006).

For the 3 trials which used nasal balloons, the OR for improvement was 3.53 (95% CI: 2.03, 6.14) which was statistically significant. Homogeneity was found between the three trials (Q = 0.52, df = 2, p = 0.76).

**Authors’ conclusions**
Evidence for the use of autoinflation in the treatment of glue ear in children is conflicting but suggests that it may be of clinical benefit. Unfortunately, the studies are of variable and low quality. None used blinded outcome assessors, and all were short-term studies.

**CRD commentary**
The authors have clearly stated their research question but not the inclusion and exclusion criteria. It is not possible to determine whether the literature search may have missed additional relevant studies since search dates, language and publication status restrictions are not stated.

The quality of the included studies was not formally assessed and the authors have not reported on how the articles were selected, or how many of the reviewers were involved in the data selection and extraction, or on the specific design of the included studies.

The data extraction is minimally reported in the report: additional study details had to be obtained from the BMJ website in order to prepare this abstract. The studies were pooled despite findings of significant heterogeneity. The authors have discussed several methodological and data limitations in the review.

Although the review results were statistically significant the authors state that they should be viewed with caution because of the stated methodological limitations of the included studies.

**Implications of the review for practice and research**
Practice: The authors cannot recommend autoinflation for clinical practice.

Research: Better designed, larger trials are needed.

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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.