The role of the nose in the pathogenesis of obstructive sleep apnoea and snoring

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CRD summary
This review assessed the effectiveness of surgical and medical treatments of nasal obstruction on snoring and obstructive sleep apnoea. The authors concluded that long-term outcomes remained undefined through randomised controlled trials of medical and surgical therapy. The conclusion reflected the evidence presented, but its reliability is unclear given the apparent lack of formal validity assessment and poor reporting of methodology.

Authors' objectives
To evaluate the effectiveness of treatments of nasal obstruction on snoring and obstructive sleep apnoea.

Searching
EMBASE and PubMed were searched to identify relevant studies. Unspecified respiratory journals were handsearched to identify further studies.

Study selection
Single or double blind randomised controlled trials (RCTs) in which an intervention to the nose was used in participants of either sex with nasal conditions and sleep disordered breathing were eligible for inclusion in the review. No restriction was placed upon the type of intervention to the nose or the duration of the study. The included studies evaluated nasal dilators, topical drug treatments and surgery. Studies used a variety of measures to assess outcomes.

Two reviewers screened abstracts (no other details of the study selection process were reported).

Assessment of study quality
The authors did not state that they assessed validity.

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

Methods of synthesis
A narrative synthesis was presented because of the variation in outcome variables. The studies were grouped according to the type of intervention investigated.

Results of the review
Nine RCTs were identified that met the inclusion criteria (n=161). Sample sizes ranged from 10 to 38 participants.

One study (n=22), a pilot RCT, investigated the effect of surgical nasal intervention (temperature controlled radio frequency reduction of turbinate hypertrophy). An assessment of nasal obstruction on a visual analogue scale by a blinded assessor showed no statistically significant difference between surgery and placebo, but participants reported a significant improvement in continuous positive airways pressure. This study was underpowered and randomisation may have been performed incorrectly.

Five RCTs (n=96), all cross over in design, investigated effects of nasal dilators. In three studies the nasal dilator was compared to a placebo. In two studies the intervention was compared to no treatment. With the exception of one study, which reported no difference in outcome measures between the intervention and placebo/non-treatment group, all studies reported an improvement in at least one outcome measure. Outcome measures varied between studies.

Three RCTs (n=43), all crossover in design, investigated the effects of topical drug treatments of steroids (fluticasone) or nasal decongestants (oxymetazoline). All studies compared the intervention to placebo. In the one study using steroids there was no difference in outcome between the intervention and placebo group. The two trials that used...
decongestants reported an improvement in sleep architecture, but only one reported a positive effect on apnoea/hypopnoea index (average change -12, 95% CI: -3 to -22).

**Authors' conclusions**
The impact of treating nasal obstruction in patients with snoring and obstructive sleep apnoea on long-term outcome remained undefined through randomised controlled trials of medical and surgical therapies.

**CRD commentary**
The review addressed a clear although broad research question. The inclusion criteria were clear, with the exception of outcome measures. The search strategy was adequate, but there was no apparent attempt to search for unpublished material, so some relevant studies may have been missed. It was not reported how study selection and data extraction were performed, therefore, reviewer bias and error might have been introduced. Although the inclusion criteria stipulated randomised controlled trials, it was not reported whether a formal assessment of validity was performed. The potential impact of methodological flaws upon the reliability of the findings can not, therefore, be assessed. Given the heterogeneous nature of the outcome measures used, it was appropriate that a narrative synthesis was used.

The authors' conclusion reflected the evidence presented, but its reliability is unclear given the apparent lack of formal validity assessment and poor reporting of review methodology.

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

**Research:** There was a need for large scale RCTs in carefully defined patient populations with obstructive sleep apnoea or snoring. Such RCTs should have endpoints that included objective measures of snoring, indices of sleep disordered breathing and daytime sleepiness and measurements of nocturnal total nasal resistance.

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