Systematic review of change in bodily pain after sinus surgery
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CRD summary
This review found a significant improvement in bodily pain after endoscopic sinus surgery in patients with chronic rhinosinusitis. Whilst the authors' conclusion is a reasonable interpretation of the evidence presented, caution should be exercised given the paucity of available data and unclear study quality.

Authors' objectives
To determine whether bodily pain is increased in patients with chronic rhinosinusitis and the efficacy of endoscopic sinus surgery for reducing bodily pain in these patients.

Searching
MEDLINE, EMBASE, the Cochrane Library, Web of Science (including ISI Proceedings) and Google Scholar were searched, unrestricted by language, from January 1980 or database inception to May 2008. Search terms were reported. Bibliographic searches of retrieved articles and manual searches of the American Journal of Rhinology not listed on Index Medicus (1987-1997) were conducted. Experts in the field were also contacted.

Study selection
Studies of any study design reporting symptom response following endoscopic sinus surgery were eligible for inclusion in the review. Studies had to include at least ten adults. Studies limited to turbinates or septum, radical surgery, surgery involving massive polyposis, or of patients with substantial co-morbidities were excluded. The primary outcome measure was bodily pain. All survey instruments measuring generic or disease specific quality of life following endoscopic sinus surgery were examined for questions relating to bodily pain.

Study designs included randomised controlled trials (RCTs), cohort studies, and record review. The surgical procedure in all studies was described as endoscopic sinus surgery but varied in extent depending on computed tomography and endoscopic findings. Most studies reported bodily pain as taken from the 36-item Short Form Health Survey; one study used the 8-item Short Form Health Survey. The mean age of participants ranged from 34 to 47.9 years, and percentage of women in each trial ranged from 28% to 67%. Some studies included patients with a prior history of nasal surgery (range 17 to 81%). Patients with serious co-morbid diseases were excluded from three studies and, in the other studies none of the patients were described as having significant co-morbid diseases.

Two reviewers independently selected studies for inclusion in the review.

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

Data extraction
Means and standard deviations were extracted in order to calculate effect size (standardised mean difference) for bodily pain scores. When standard deviations were unavailable, they were estimated based on the available 36-item Short Form Health Survey bodily pain domain standard deviation scores. When studies only reported results of separate groups (e.g., men and women), scores were weighted according to sample size and aggregated. Authors were contacted where additional information was required.

Two reviewers independently extracted data from the included studies.

Methods of synthesis
Studies were pooled in a meta-analysis, using both fixed-effect and random-effects models. Summary estimates were reported as standardised mean difference and odds ratios with their associated 95% confidence intervals. Statistical heterogeneity was assessed using the $I^2$ statistic.
Results of the review

Eleven studies were included in the review (n=1,020); one RCT (n=45), one clinical trial (n=108), seven prospective cohort studies (n=667), one retrospective study with randomly selected patients (n=150), and one retrospective record review with consecutive patients (n=50). Mean duration of follow-up was 10.1 months (range 3 to 36 months).

Preoperative bodily pain scores (using 36-item Short Form Health Survey) indicated a greater burden of bodily pain (24%) when compared to USA national or local population norms. Postoperative bodily pain scores improved to values similar to USA national or local population norms in seven studies.

Nine of the eleven studies reported a significant improvement in 36-item Short Form Health Survey bodily pain domain scores following endoscopic sinus surgery, and pooled results demonstrated a moderate effect size 0.55 (95% confidence interval: 0.45 to 0.64). Moderate statistical heterogeneity was found ($I^2=44\%$). The effect size did not substantially differ when performed with a random-effects model.

Authors’ conclusions

Bodily pain was increased in patients with chronic rhinosinusitis awaiting endoscopic sinus surgery, and a significant improvement in bodily pain was found after endoscopic sinus surgery.

CRD commentary

The review question was supported by broad inclusion criteria, particularly in terms of study design and outcome. Several sources were searched for relevant studies, non-published literature was sought and non-English articles were included, reducing the possibility of language and publication bias. Methodological methods used to select studies for inclusion and extract data were likely to minimise the possibility of reviewer error and bias.

The authors did not appear to have assessed study quality, limiting any interpretation of the results. The decision to combine studies in a meta-analysis appeared appropriate and statistical heterogeneity was assessed.

It should be noted that one of the review authors made the financial disclosure that he is or was a research consultant for Sinexus, Inc.

Whilst the authors' conclusion is a reasonable interpretation of the evidence presented, caution should be exercised given the paucity of available data and unclear study quality.

Implications of the review for practice and research

The authors did not state any implications for research or practice.

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