The use of perioperative antibiotics in tonsillectomy: does it decrease morbidity
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CRD summary
This review assessed the efficacy of peri-operative antibiotics in decreasing post-operative morbidity amongst patients undergoing tonsillectomy and adenotonsillectomy. The authors concluded that antibiotics reduce the time to return to normal oral intake by 1 day, but the effect on other potentially important outcomes was unclear. This cautious conclusion is justified given the variable nature of the studies.

Authors' objectives
To determine the efficacy of systemic peri-operative antibiotics in reducing post-operative morbidity among patients undergoing tonsillectomy or adenotonsillectomy.

Searching
MEDLINE, EMBASE, Cochrane databases (including the Cochrane Controlled Trials Register), ACP Journal Club, DARE, MD Consult and UpToDate were searched from inception to April 1, 2005; the search terms were reported. Internet searches using Google were also carried out. The reference lists of included studies and reviews were checked for further data. No limits were placed on the language of publication. The authors were unable to locate four studies identified as potentially eligible from their abstracts.

Study selection
Study designs of evaluations included in the review
All published studies were eligible for inclusion. All but one of the studies included in the review were randomised controlled trials (RCTs).

Specific interventions included in the review
Studies comparing any regimen of systemic (oral or intravenous) peri-operative antibiotics with no antibiotics were eligible for inclusion. Where reported, the studies included in the review assessed the following types of antibiotics versus placebo: oral augmentin for 7 days; one dose of intravenous cefonicid; one dose of intravenous timentin followed by 7 days of oral augmentin; oral amoxicillin for 5 days; and a single dose of intravenous ampicillin followed by 7 days of oral amoxicillin. Studies of topical antibiotics or systemic or topical steroids were excluded.

Participants included in the review
Studies of patients undergoing tonsillectomy or adenotonsillectomy were eligible for inclusion. Studies of children, adolescents and adults were included in the review. Where reported, the age ranges within the included studies ranged from 1 to 48 years. The authors stated that the studies used different types of surgical techniques, but provided no details.

Outcomes assessed in the review
To be eligible for inclusion in the quantitative analysis, studies had to report a point estimate and a measure of statistical variability for the time required for return to normal oral intake. Studies reporting other relevant outcomes were reported in the review, but were not included in the quantitative analysis. Other relevant outcomes included pain (also considered to be a primary review outcome), weight loss, days of (severe) halitosis, days until routine activity level, incidence of post-operative bleeding, incidence of nausea and vomiting, and incidence of post-operative fever.

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

Assessment of study quality
The quality of the RCTs was assessed using the Jadad scale. Each included RCT was awarded a quality score of between 1 and 5 points. The authors did not state how many reviewers performed the quality assessment, or how any disagreements were resolved.

Data extraction
Two reviewers independently abstracted the data from the studies and any differences were resolved by group consensus. Data were extracted, where reported, on the mean number of days to normal diet together with the standard deviation and/or statistical significance of the treatment difference.

Methods of synthesis
How were the studies combined?
Effect sizes for studies reporting sufficient data for time to return to normal oral intake were combined using both fixed-effect and random-effects models. A qualitative synthesis was used to combine other outcome data. Publication bias was assessed using Begg’s funnel plot, although the authors stated that this has limited significance given the small number of studies included in the review.

How were differences between studies investigated?
Statistical heterogeneity was assessed using the Q statistic. In an attempt to further detect heterogeneity, the effect sizes from the fixed-effect and random-effects models were compared. The influence of study quality on the time to return to normal activities was examined by ordering the RCTs in the meta-analysis by their Jadad quality score.

Results of the review
Seven studies (n=580) were included in the review; six RCTs (n=485) and one observational study with a control group (n=95).

Three RCTs scored the maximum number of points on the Jadad quality scale, while one scored 4 points and another scored 2 points. The seventh study was an observational study.

Time to return to normal oral intake.
A pooled mean difference of 1.0 day (95% confidence interval, CI: 0.5, 1.6; Q=2.36, P>0.05; three RCTs, n=310) was observed in favour of antibiotic treatment. Both random-effects and fixed-effect models showed similar results. No statistically significant heterogeneity was found (P>0.05). Begg’s funnel plot did not show any evidence of publication bias.

Pain.
One RCT reported no statistically significant difference between treatments in mean daily pain scores. One RCT reported a statistically significant reduction in analgesic use in patients taking antibiotics. The observational study reported a reduction in the percentage of patients requiring analgesics from their general practitioner with the use of antibiotics, but the statistical significance of this result was not reported in the review.

Secondary outcomes.
No significant differences were found between untreated patients and those treated with antibiotics in terms of post-operative bleeding (three RCTs and one observational study), nausea and vomiting (one RCT and one observational study) and halitosis (two RCTs and one observational study). One of three RCTs showed a significant reduction in the incidence of post-operative fever. Two of three RCTs reported a significant decrease in the time required to return to normal activity.

Authors’ conclusions
Tonsillectomy or adenotonsillectomy patients treated with peri-operative antibiotics appear to experience a 1-day
reduction in the time required to return to normal oral intake, compared with those who do not receive antibiotics. Definitive conclusions were not available for other potentially important outcomes such as post-operative pain and bleeding.

CRD commentary
This review was based on clear inclusion criteria and an extensive search of electronic databases. However, there are some concerns that the reviewers may not have taken appropriate steps to reduce the risk of selection bias, as they did not report how studies were selected for inclusion. It was also unclear how many reviewers were involved in the assessment of study quality, although studies were assessed and awarded a quality score according to the Jadad scale. The effect of study quality on the review findings was also investigated using meta-regression. The quality of the observational study was not reported.

Details of the individual studies were tabulated clearly and the methods used to analyse the data were appropriate. Some statistical heterogeneity was observed between the pooled studies, but was not judged to be significant by statistical tests (Q-statistic). The studies did, however, differ in terms of their populations, interventions and outcomes, which is of concern. Similarly, a funnel plot failed to show any evidence of publication bias. However, the reliability of the Q statistic and funnel plot is questionable given the small number of included studies. Overall, the authors are rightly cautious about the significance of their findings given the review's somewhat limited and variable data.

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

Research: The authors stated that in order to assess the true benefit of peri-operative antibiotics in tonsillectomy and adenotonsillectomy patients, large multicentre RCTs are required. These should use uniform surgical techniques, antibiotic regimens and outcome measures. Studies should also assess the potential additional benefit of steroid usage.

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Other publications of related interest

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Record Status
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.