Effectiveness and safety of short vs long duration of antibiotic therapy for acute bacterial sinusitis: a meta-analysis of randomized trials
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CRD summary
This generally well-conducted review concluded that short-course antibiotic treatment (median five days) was as effective as longer-course treatment (median 10 days) for patients with acute uncomplicated bacterial sinusitis. This conclusion accurately reflected the results of the review and is likely to be reliable.

Authors' objectives
To compare the efficacy of short-course antibiotics with longer treatment duration for the treatment of acute bacterial sinusitis.

Searching
PubMed and Cochrane Central Register of Controlled Trials (CENTRAL) were searched. Search terms but not search dates were reported. References of identified studies were checked. Studies reported only in abstract form were excluded, as were studies in languages other than English, French, Spanish, Italian, German or Greek.

Study selection
Randomised controlled trials (RCTs) that compared short-course (up to seven days) with long-course treatment with the same antibiotic, at the same daily dose, in the treatment of acute bacterial sinusitis, in patients of all ages, were eligible for inclusion. Acute bacterial sinusitis had to be diagnosed on the basis of clinical criteria, with or without the use of additional imaging, microbiological or laboratory criteria. Detailed definitions of criteria for clinical diagnosis were reported in the paper. There had to be a difference of a minimum of two days difference between the regimes evaluated. Trials were required to evaluate at least 30 patients in each of the trial arms relevant to this review. Included trials had to report data on the following outcomes: clinical cure or improvement of symptoms and signs (primary outcome), microbiological efficacy, relapses, adverse events, or withdrawals due to adverse events. Trials with mixed patient populations were included if data for those with acute bacterial sinusitis were reported separately, or if such patients comprised over 70% of all patients in the trial.

Included trials used the following antibiotics: azithromycin, beta-lactams, fluoroquinolones, telithromycin and trimethoprim/sulfamethoxazole; a range of doses were used. Concomitant therapies (where allowed) included paracetamol, anti-inflammatory agents, cough preparations and decongestants (including antihistamines, local vasoconstrictors, oxymetazoline and prednisolone or methylprednisolone). Short-course therapies lasted between three to seven days, and long-course therapies between six and 10 days; the most common comparison was five day versus 10 day regimens. Test-of-cure visits took place between trial days 10 and 36. All trials were in adults with uncomplicated sinusitis.

Two reviewers independently assessed the studies for inclusion; differences were resolved by discussion with two other reviewers.

Assessment of study quality
The trials were assessed for validity using the Jadad scale, awarding up to 5 points for the criteria of randomisation, blinding and reporting of withdrawals and drop-outs.

The authors did not state how many reviewers performed the validity assessment.

Data extraction
Data were extracted to permit the calculation of odds ratios (OR) with 95% confidence intervals (CI). Where data for the combined outcome of cure or improvement were not reported, data for cure alone were included.
Data were independently extracted by two reviewers; differences were resolved by discussion with two other reviewers.

**Methods of synthesis**
Pooled odds ratios with 95% confidence intervals were calculated in meta-analyses using both Mantel-Haenszel fixed-effect and DerSimonian and Laird random-effects models. Heterogeneity between trials was assessed using the $X^2$ and $I^2$ statistics; where statistically significant differences were detected results from the random-effects models were presented, otherwise the fixed-effect analyses were reported. Sensitivity analyses which included only trials that compared five day and 10 day treatments, or only trials using beta-lactams were conducted. Publication bias was assessed by visual inspection of funnel plots.

**Results of the review**
Twelve RCTs (n=4,430 patients) were included in the review. Trial quality was generally high; ten trials were double-blinded and Jadad scores reflected this, with four trials scoring 5 points, six scoring 4 points and two scoring 3 points.

There was no statistically significant difference between long and short-course antibiotics for the primary outcome of clinical success (cure or improvement of symptoms) (OR 0.95, 95% CI 0.81 to 1.12; 12 RCTs). There was no statistically significant heterogeneity ($I^2=0\%$). The sensitivity analyses showed similar results. There were no statistically significant differences between the groups in the overall analyses for the outcomes of microbiological efficacy (three RCTs), relapses (five RCTs), adverse events (10 RCTs) or withdrawals due to adverse events (11 RCTs). Significant heterogeneity was reported only for the outcome of adverse events ($I^2=44.1\%$). A sensitivity analysis did show significantly fewer adverse events in patients treated for five days compared to those treated for 10 days (OR 0.79, 95% CI 0.63 to 0.98; five RCTs), but no other statistically significant results were found in the sensitivity analyses.

**Authors' conclusions**
Short-course antibiotic treatment (median five days) was as effective as longer-course treatment (median 10 days) for patients with acute uncomplicated bacterial sinusitis.

**CRD commentary**
The review question and the inclusion criteria were clear and specific. Two relevant databases were searched for studies in several languages. This reduced, but did not remove, the potential for language bias. No systematic search for unpublished studies was reported and, while publication bias was apparently assessed, the results of this assessment were not reported. The authors used methods designed to reduce reviewer bias and error in the selection of the studies and the extraction of data, but did not report doing so for the assessment of validity.

The decision to use meta-analyses was appropriate. Heterogeneity was assessed using appropriate methods. The decision to use sensitivity analyses for the comparison of particular durations of treatment was sensible and informative.

The authors' conclusions reflect the results of the review and are likely to be reliable.

**Implications of the review for practice and research**
**Practice:** The authors stated that shorter duration treatments for acute bacterial sinusitis may become the standard treatment but the clinician's own assessment should remain paramount in ensuring that antibiotic therapy is not inappropriately curtailed in a patient who does not respond adequately to the regimen administered.

**Research:** The authors did not state any implications for further research.

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