Efficacy of exclusively oral antibiotic therapy in patients hospitalized with nonsevere community-acquired pneumonia: a retrospective study and meta-analysis
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CRD summary
This review assessed oral versus parenteral antibiotic therapy in patients with community-acquired pneumonia. The authors concluded that oral therapy is effective in terms of clinical success and mortality. Several methodological and reporting limitations of the review mean that the authors' conclusions should be treated with caution.

Authors' objectives
To assess the efficacy of oral versus parenteral antibiotic therapy in in-patients with community-acquired pneumonia (CAP).

Searching
The authors searched MEDLINE and EMBASE to March 2003, and PREMEDLINE to May 2003; the search terms were listed. The bibliographies of all retrieved articles and relevant reviews were checked. Also searched were ACP Journal Club, the Cochrane Controlled Trials Register, the Cochrane Database of Systematic Reviews and DARE. The searches were limited to studies published in English.

Study selection

Study designs of evaluations included in the review
Inclusion criteria for the study designs were not explicitly stated. The included studies were all open randomised trials.

Specific interventions included in the review
The inclusion criteria specified studies that compared the use of exclusively oral to parenteral antibiotic therapy. The included trials used a range of antibiotics (listed in the review) of varying doses; the most commonly used oral agents were fluoroquinolones. The control interventions included both intramuscular and intravenous treatments. The duration of the treatment regimens was not described.

Participants included in the review
Studies of adults with CAP who were admitted to hospital for treatment were eligible for inclusion. The included patients were predominantly male (60%) and all were aged over 14 years. The mean age was 60 years in the oral treatment group and 63 years in the parenteral treatment group. Most of the included studies excluded patients with severe illness, usually defined by the need for management in the intensive care unit.

Outcomes assessed in the review
Studies that reported data on clinical success, mortality or length of hospital stay were eligible for inclusion. In the included studies, clinical success was measured at the end of treatment and at follow-up, while mortality was analysed as in-hospital and at follow-up. The duration of follow-up ranged from the time of discharge to 60 days post-treatment. 'Clinical success' was not defined.

How were decisions on the relevance of primary studies made?
It appeared that two authors reviewed all retrieved abstracts for relevance.

Assessment of study quality
The studies were assessed for validity using a scale adapted from Heintjes et al. (see Other Publications Of Related Interest). Each study was assigned a score out of 10 for quality, based on ten criteria. Two authors independently assessed the validity of the studies. Any discrepancies were resolved by discussion.
Data extraction
Two authors independently extracted the data. Any discrepancies were resolved by discussion. For mortality and clinical success, the numbers of patients with the outcome in each group were used to calculate the relative risk (RR). The mean length of stay was also extracted.

Methods of synthesis
How were the studies combined?
The studies were combined in a meta-analysis using a random-effects model.

How were differences between studies investigated?
Heterogeneity was evaluated using the Mantel-Haenszel method. The results were considered heterogeneous if the P-value was less than 0.2. Analyses showing significant heterogeneity were repeated with the exclusion of studies considered the main source of heterogeneity.

Results of the review
Seven trials (n=1,366) were included.

The quality scores ranged from 5.17 to 7.5.

Clinical success at the end of treatment (5 studies).

There was no benefit of oral over parenteral treatment; the RR was 1.02 (95% confidence interval, CI: 0.97, 1.07, P=0.50) and there was some evidence of heterogeneity between studies (P=0.17). The overall success rate was 90% for the oral group and 86% for the parenteral group.

Clinical success at follow-up (5 studies).

There was no benefit of oral over parenteral treatment; the RR was 1.07 (95% CI: 0.98, 1.16, P=0.13) and there was significant heterogeneity between studies (P=0.02). The overall success rate was 85% for the oral group and 86% for the parenteral group.

Mortality at follow-up (4 studies).

There was no benefit of oral over parenteral treatment; the RR was 0.61 (95% CI: 0.26, 1.41, P=0.25) and there was no evidence of heterogeneity between studies (P=0.91). The overall mortality rates was 2.7% for the oral group and 4.7% for the parenteral group.

Mortality at the end of treatment.

Although there appeared to be no benefit of oral over parenteral treatment from the diagram presented, there appeared to be an error in the quoted figures.

Length of stay.

The mean length of stay was 6.1 days in the orally treated groups and 7.8 days in the parenterally treated groups.

Authors' conclusions
Exclusive oral antibiotic therapy for patients with CAP was effective, although there was insufficient evidence to identify appropriate candidates for such treatment.

CRD commentary
The authors had a clear review question and inclusion or exclusion criteria in terms of the study design and participants.
The authors searched a range of relevant sources, but the limitation of the search strategy to English language papers means that some relevant papers could have been missed. Furthermore, there was no mention of any attempt to identify unpublished trials and there was no attempt to investigate the possibility of publication bias. The methods used to select studies and extract the data were not described in detail, but some efforts to reduce errors and bias in the review process (duplicate study selection and data extraction) appear to have been made. The assessment of validity was comprehensive, although subgroup analyses based on high-quality studies alone were not conducted.

The authors noted the limitation of the included trials in terms of their lack of a description of the participants, in particular severity of pneumonia. Significant heterogeneity was present for some outcomes and this, together with the lack of information about the participants, suggested that the decision to pool the included studies may not have been appropriate. Insufficient details on the main outcome (i.e. clinical success) limits the interpretation of these results. It is important to note that there is a typographical error in the presentation of the main results (mortality at the end of treatment).

In view of the limitations in methodology and reporting of the review, the authors' conclusions should be regarded with caution.

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

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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.