Early switch to oral versus intravenous antimicrobial treatment for hospitalized patients with acute pyelonephritis: a systematic review of randomized controlled trials

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CRD summary
This review evaluated early switching to oral treatment compared to remaining on intravenous antibiotic therapy in patients with acute pyelonephritis and concluded that it was effective and safe to do so in children. The conduct of the review was not well reported and so the results need to be treated with some caution.

Authors’ objectives
To evaluate the effectiveness and safety of early-switching to oral treatment compared to remaining on conventional intravenous antibiotic therapy in hospitalised patients with acute pyelonephritis

Searching
The authors searched PubMed, Cochrane Central Register of Controlled Trials (CENTRAL) and Scopus up to March/April 2008. Search terms were reported. Bibliographies of relevant articles were searched. Studies published in languages other than English, Spanish, French, German, Italian and Greek were excluded from the review.

Study selection
Randomised controlled trials (RCTs) of patients of any age hospitalised due to acute pyelonephritis were eligible for inclusion in the review. Trials needed to compare intravenous antibiotic regimens (either not switched to oral antibiotic treatment until the end of the study period or switched to oral antibiotic treatment later than the comparator arm) with treatment regimens initially administered or followed by an early switch to oral treatment. Time of switching could be according to an individual study protocol or from patients’ clinical response. Early switch was defined as administration of oral antibiotics after at least one day of initial treatment with intravenous antibiotics. Definitions were provided by the authors for acute pyelonephritis, concomitant treatment and the outcomes of interest.

Conference abstracts, letters and commentaries were excluded from the review. Studies published in languages other than English, Spanish, French, German, Italian and Greek were excluded.

The review included six trials of paediatric populations and two of adult populations. A range of intravenous and oral antibiotic treatment regimens and concomitant treatments was used. Timing of switch from intravenous to oral antibiotics varied (full details in the paper). Duration of treatment varied across the trials from five to 21 days. Total duration of treatment was the same in both treatment arms in all except one trial. Follow-up varied between three days and nine months post-treatment. Outcomes assessed were renal scarring, microbiological eradication, clinical success, reinfection and persistence and adverse events.

The authors did not state how many reviewers performed the study selection.

Assessment of study quality
Quality of the included trials was assessed using the Jadad criteria of randomisation, blinding and study withdrawals (maximum was 5 points).

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

Data extraction
The authors did not state how data were extracted for the review.

Methods of synthesis
A narrative synthesis was conducted.
Results of the review
Eight RCTs were included in the review (n=1,235 patients, range 36 to 548 patients). Four trials received 3 out of 5 on the quality scale, two scored 2 and two scored 1 point.

None of the outcomes were statistically significant: renal scarring (assessed by four paediatric trials, no adult data), microbiological eradication (four paediatric trials, two adult trials), clinical success (two paediatric trials and two adult trials), reinfection (three paediatric trials and two adult trials), persistence (one paediatric trial and two adult trials) and adverse events (three paediatric trials and two adult trials).

Authors’ conclusions
Early switching to oral antibiotic strategies seemed to be as effective and safe as remaining on intravenous antibiotics for treatment of children with acute pyelonephritis.

CRD commentary
The review was based on defined inclusion criteria for population, intervention, outcomes and study design. Searching encompassed a number of databases and additional sources. It was unclear whether unpublished studies were eligible for inclusion in the review, which opened up the possibility of publication bias. Overall quality of the trials was assessed, but the impact of quality on the results of individual trials was not reported in full. A narrative synthesis was appropriate given observed clinical heterogeneity between the included trials. Any conclusions on equivalence of treatment regimes would need confirmation in further appropriately designed trials. Several stages of this review were not fully detailed; for example, procedures to reduce bias and errors in the study selection, data extraction and quality assessment processes were not reported. For this reason, the results of the review need to be treated with some caution.

Implications of the review for practice and research
Practice: The authors stated that there was probably a potential to decrease duration of intravenous treatment by four to 11 days in hospitalised patients with acute uncomplicated pyelonephritis without compromising their outcomes. The paucity of data in adults does not allow for extrapolation into clinical practice.

Research: Further studies focused on both paediatric and adult populations with acute pyelonephritis treated with early-switch strategies would provide information for clinicians to consider such strategies in practice.

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