Early transition to oral antibiotic therapy for community-acquired pneumonia: duration of therapy, clinical outcomes, and cost analysis

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Using an abbreviated course of intravenous therapy (2-day i.v. antibiotic course followed by switch to oral antibiotics (cefaclor)) for the treatment of hospitalised patients with community-acquired pneumonia.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients over 18 years of age experiencing moderate or severe illness, who were hospitalised for the treatment of clinically suspected community-acquired bacterial pneumonia.

Setting
Hospital. The economic study was carried out in the USA.

Dates to which data relate
The effectiveness and resource use data were collected between October 1985 and October 1987. The price year was not specified.

Source of effectiveness data
Effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was retrospectively undertaken on the same patient sample as that used in the effectiveness analysis.

Study sample
Power calculations were used to determine the sample size (for the detection of a 15-20% difference between the groups a sample size of 32-34 patients was required for each group). A total of 135 patients entered the study. All patients initially received cefamandole nafate for a minimum of 48 hours and then were randomly assigned to either standard intravenous cefamandole (n=37, average age 63.5 years, range: 17 - 93) or early oral treatment with cefaclor (n=58, average age 60.5 years, range: 18 - 95).40 patients were excluded from the study sample.
Study design
The study was a multicentre randomised controlled trial. The duration of the follow-up was 28 days. No loss to follow-up was reported.

Analysis of effectiveness
The analysis of effectiveness was based on treatment completers only. The outcome measures were overall rate of clinical response, failure in clinical response, relapse, death, the identification of infecting organisms, and adverse effects. The groups were shown to be comparable in terms of demographic characteristics and underlying illness.

Effectiveness results
The standard group had an overall rate of clinical response of 97% versus 95% in the early oral therapy group. The number of patients with failed clinical response was 1 in each group. The number of patients with relapse was 0 in the standard group versus 2 in the early oral therapy group. Death occurred for 2 patients in the standard group versus 3 in the intervention group. The identification of infecting organisms was 72% in the intervention group versus 84% in the control group. 24.3% of the standard group had adverse events versus 18.9% in the intervention group.

Clinical conclusions
It is safe for a majority of hospitalised patients with community-acquired pneumonia to leave hospital in less than 5 days following an initial intravenous antibiotic response to cefaclor. All of the deaths occurred several days after discontinuing the study drugs and occurred in the highest risk patients. These deaths were secondary to the patients' underlying disease, and probably not related to the diagnosis of pneumonia.

Measure of benefits used in the economic analysis
No summary benefit measure was identified in the economic study, and only separate clinical outcomes were reported.

Direct costs
Cost discounting was not required as the study period was less than one year. Quantities were not systematically reported separately from the costs, although cost items were reported separately. Cost analysis covered the inpatient (daily hospital charges, laboratory fees, pharmacy administration and drug costs) and outpatient (follow-up phone call, clinic visit to a nurse practitioner, and sputum costs) costs. Inpatient costs were based on hospital bills while outpatient costs were based on estimation. The perspective adopted in the cost analysis was not explicitly specified. The date of the price data was not given.

Statistical analysis of costs
Statistical analysis (of an unspecified type) was performed to compare the groups in terms of inpatient, outpatient, and total costs.

Indirect Costs
Not considered.

Currency
US dollars ($).

Sensitivity analysis
Not performed.
Estimated benefits used in the economic analysis
Not applicable.

Cost results
The average total cost was $5,001.57 for the control group versus $2,952.48 in the intervention group, (p<0.05).

Synthesis of costs and benefits
A synthesis was not performed since the abbreviated therapy was weakly dominant (similar effectiveness and less costs).

Authors’ conclusions
It was concluded that early transition to an oral antibiotic after an abbreviated course of intravenous therapy in CAP is substantially less expensive than intravenous therapy and is of comparable efficacy. Altering physicians’ customary management of hospitalised patients with CAP can reduce costs with no appreciable additional risk of adverse patient outcome.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparator is clear.

Validity of estimate of measure of effectiveness
The internal validity of the estimates of effectiveness is likely due to the randomised design used in the effectiveness analysis. As the findings show similar effectiveness for the two strategies this study can be classified as a cost-minimization study.

Validity of estimate of costs
Resource utilisation was not reported separately from the costs, although adequate details of the methods of cost estimation were given. The cost data were collected retrospectively.

Other issues
The issue of generalisability to other settings was discussed by the authors and appropriate comparisons with other studies were made.

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