Blood cultures in the evaluation of children with cellulitis

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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
Blood cultures performed on children admitted for cellulitis in the post-Haemophilus influenzae type b (Hib) vaccine era.

Type of intervention
Diagnosis.

Economic study type
Cost-effectiveness analysis.

Study population
Children admitted for cellulitis in the post-Hib vaccine era.

Setting
Hospital. The economic study was conducted in Washington DC, USA.

Dates to which data relate
Effectiveness and resource use data were collected between 1 January 1994 and 31 December 1995. The price year was not explicitly specified.

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

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

Study sample
Power calculations were not used to determine the sample size. The study sample consisted of 243 patients with a mean (standard deviation) age of 6.2 (5) years. 23 patients were excluded from the study sample.

Study design
This was a retrospective case series, carried out in a single centre. The duration of the follow-up and loss to follow-up were not specified.
Analysis of effectiveness
The principle used in the analysis of effectiveness was treatment completers only. The primary health outcome measure was the category of blood cultures (positive, negative, or contaminant). The type of organisms grown in positive cases was reported. In this study the sample of patients also served as the control group.

Effectiveness results
A total of 5 patients (2.1%; 95% CI: 0.67 - 4.74) had positive results. The corresponding figure for contaminated cultures was 13 (5.4%; 95% CI: 2.88 - 8.97). The patients with positive results had a lower mean age (26 versus 75 months, p<0.01) and higher mean BNR (0.32 versus 0.07, p<0.001). Streptococcus and staphylococcus organisms were identified as present in positive cases and there were no cases of H. influenzae.

Clinical conclusions
Positive blood cultures were uncommon and were seen only in association with active varicella or underlying soft-tissue infections (osteomyelitis, septic arthritis). Blood cultures were twice as likely to be contaminated than positive. The small number of bacteremic patients precludes definitive statements about the prospective use of the complete blood count or BNR to predict bacteremia.

Measure of benefits used in the economic analysis
The number (percentage) of patients with cellulitis in each category of blood cultures was implicitly considered as the main benefit measure.

Direct costs
Discounting was not required due to the short time frame involved. Quantities were not reported separately from the costs. The cost analysis covered the costs of aerobic culture, anaerobic culture, sensitivity for positive blood culture, and repeat cultures. Charges were used instead of true costs. The perspective adopted in the cost analysis was not explicitly specified. Actual charge data from the study hospital were used in the cost analysis. The date of the price data was not stated.

Indirect Costs
Not considered.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
The numbers of patients with negative, contaminated, and positive blood cultures were 225, 13, and 5, respectively. If the comparator (having a BNR=0.20 to be sent for blood culture) had been applied, a total of 213 patients (88%) could have avoided blood culture, while one case of positive culture would have been missed.

Cost results
The policy of obtaining blood cultures had a cumulated charge of $50,986. The estimated savings due to the hypothetical application of the comparator was $42,850.
Synthesis of costs and benefits
Costs and benefits were not combined.

Authors' conclusions
Blood cultures are not cost-effective and are more frequently contaminated than positive in the evaluation of a patient with uncomplicated cellulitis. Since introduction of the H. influenzae type b vaccine, the most common organisms are streptococci. Using a BNR of 0.20 as a threshold for sending blood cultures, one positive culture would have been missed, but this way 213 patients (88%) would have avoided blood cultures with estimated savings of $42,850.

CRD COMMENTARY - Selection of comparators
A justification was given for the choice of the comparator.

Validity of estimate of measure of effectiveness
As acknowledged by the authors, the internal validity of the effectiveness results may be weakened by the lack of a prospective design.

Validity of estimate of costs
Quantities were not reported separately from the costs and adequate details of methods of cost estimation were not given. The study lacked a prospective cost analysis covering all resource utilisation involved.

Other issues
In view of the lack of a prospective design, sensitivity analysis, and statistical analysis of the costs, the results need to be treated with some caution. The issue of generalisability to other settings or countries was not addressed.

Source of funding
None stated.

Bibliographic details

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Subject indexing assigned by NLM

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