How do blood cultures sent from a paediatric accident and emergency department influence subsequent clinical management?

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METHODS

All children who attended the department over a seven month period and had blood culture investigations were identified. Case notes of patients who had any growth on blood culture were reviewed to determine whether the organism was felt to be pathogenic and how the result affected clinical management.

RESULTS

Altogether 15 938 children attended the department as new patients during the study period. Of these 1159 (7.3%), aged between 2 days and 15 years, had blood cultures sent, 111 grew an organism, 26 (2.2%) of which were felt to be pathogenic rather than a contaminant.

Pathogenic organisms were more likely to be identified in blood cultures taken from children aged less than 12 months. This relation was less marked if considering all children aged less than 2 years and did not achieve statistical significance in children aged less than 3 years (table 1).

It can be seen from table 2 that in 16 patients the blood culture result did not affect the management of the patient, either because empirical treatment had been started based on a clinical diagnosis or because culture of other specimens had already identified the organism. In five patients minor changes to the management of the patient were made (for example, narrowing antibiotic range), but these were unlikely to have a significant effect on outcome. Of the five patients who had positive blood cultures that significantly changed their management, four had been felt to be well enough for discharge clinically before the blood culture result and were recalled from home to have additional antibiotic therapy.

The cost of these investigations, including microbiologist time involved in follow up and notification, etc, was estimated as £4800 for the seven month study period by our local laboratory.

DISCUSSION

Blood culture investigations performed in a paediatric A&E department are costly and only yield a positive result that
changes clinical management in less than 0.5% of patients. This is similar to yields reported in adult emergency department and perioperative patients. A previous small study showed no difference in the outcome of children with a febrile illness who did not have a blood culture taken, however an earlier study identified a small but significant number of children with complications of bacteraemia that would not have been detected without blood culture analysis. We did not undertake to investigate the effects of positive cultures felt to be attributable to non-pathogenic organisms other than relying on blood cultures. Increasing availability and accuracy of polymerase chain reaction testing for bacterial DNA and assays for specific bacterial antigens permit rapid identification of common causative organisms (for example, meningococcus, pneumococcus, and haemophilus) although offer no means of determining antibiotic sensitivity.

CONCLUSION
Blood cultures have a very low yield and often do not influence the clinical management of the paediatric emergency department patient. They should be reserved for use in the investigation of younger children, particularly those aged less than 12 months, who have no focal signs of infection to explain their fever and appear clinically unwell.

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Contributors
Both authors conceived of the original idea for the paper. PL collected the data and performed the analysis. Both authors contributed to the final version of the paper.

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REFERENCES