Do blood cultures need continuous monitoring so that clinical action can be taken outside normal working hours?

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Abstract

Many automated blood culture reading systems monitor bacterial growth 24 hours a day but it is unclear if reacting to prompts indicating bacterial growth outside normal laboratory hours is of clinical benefit. An analysis of 50 blood cultures from 43 patients which had organisms seen on Gram films and had triggered positive out-of-hours showed that examination of the Gram film altered management of seven patients and the results of culture or sensitivity testing altered that of a further four. However, after review, it was felt the clinical outcome would not have been influenced by earlier intervention in any of these patients. We therefore consider that an out-of-hours service for dealing with positive blood cultures is not justified in our hospital. This conclusion may not apply universally, especially in hospitals where potential pathogens show less predictable antimicrobial sensitivity patterns. (J Clin Pathol 1995;48:1067–1068)

Keywords: Continuous monitoring, blood cultures, out-of-hours service.

The introduction of automated systems¹ allows blood cultures to be monitored continuously with, potentially, more rapid transmission of data to medical microbiologists and clinicians. However, very little has been published on the impact that such rapidly available data might have on clinical outcome. Southmead Hospital is a 1000 bed university associated hospital incorporating general medical and surgical specialties, obstetrics and gynaecology, as well as specialist services in renal medicine, orthopaedics, infectious diseases, clinical haematology, and neonatology. The automated blood culture system (Sentinel, Difco, East Molesey, UK) in use at Southmead Hospital only has staff available to follow up positive prompts between 0900 and 1700 hours each day (including weekends). We wished to determine whether the availability of an out-of-hours service would lead to significant changes in patient management and outcome, so we studied a sample of patients whose blood cultures first indicated potential bacterial growth outside normal working hours.

Methods

A computer based printout of culture positive out-of-hours blood samples between April and July 1992 was prepared. Forty three patients (50 positive cultures) out of 77 were studied; clinical records were not available for the remainder. For each patient, the following information was recorded: date of birth, clinical diagnosis, antibacterials (dose, route, frequency, dates of administration), details of the blood culture isolate, advice communicated to clinicians, and any change of therapy. An analysis was made of whether earlier communication would have altered management and ultimate outcome. An independent assessor (GES) examined the notes of the patients in whom earlier intervention might have influenced outcome.

Results and Discussion

The isolates from 19 episodes were judged to be contaminants or probable contaminants by medical microbiologists in consultation with their clinical colleagues. Of these, 17 were coagulase negative staphylococci (CNS), one a viridans streptococcus and one a mixture of Enterococcus faecalis with an aerobic spore bearer. One patient was started unnecessarily on fluclouxacillin for a suspected Staphylococcus aureus infection which cultures subsequently revealed to be a CNS. Of the 31 clinically important episodes, three patients died within six hours; all were on antibiotics active against the organism isolated from their blood culture. The results of microscopy or culture altered the management of 11 (22%) patients.

Examination of the Gram film led to an immediate change in therapy for seven patients (table) but we considered that earlier intervention would not have affected outcome. Therapy was altered in four cases when the identity of the organism or its antibiotic sensitivities became known; earlier processing would have led to more rapid identification and sensitivity testing, with an earlier change in therapy. However, the delay caused by our existing policy did not lead to a significantly worse outcome in any of these patients. Apart from the increase in staff costs, monitoring blood cultures overnight would lead to many extra telephone calls to clinicians, many of which would not result in a change of therapy. Often the hard-pressed junior staff providing cover at night do not know all the clinical details of the patients and in these cases it is possible that unnecessary antibiotics might be administered for defensive reasons.

In conclusion, we do not consider that an out-of-hours monitoring service is justified in

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Neomycin blood agar as a selective medium for vancomycin resistant Enterococcus faecium

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Abstract
Neomycin blood agar is commonly used as a selective medium for the isolation of vancomycin resistant enterococci from faeces; however, not all isolates are recovered using this medium, perhaps because the neomycin concentrations are too high. To test this hypothesis, the neomycin minimum inhibitory concentration (MIC) was determined for 27 vancomycin resistant Enterococcus faecium isolates, 14 from patients with leukaemia and 13 from patients on the renal unit. A further eight isolates that had been recovered from the faeces of patients on the renal unit on neomycin agar were also studied. Eleven of the 14 isolates from the patients with leukaemia showed equal recovery on neomycin agar and blood agar and had MICs >64 mg/l. In three other isolates there was...