Randomized Trial of Blood Culture Pathogen Identification using the FilmArray Blood Culture ID (BCID) panel vs. Standard Techniques: Impact on Antimicrobial use and Outcomes

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Abstract

Background: Prior clinical trials studying antibiotics on rates of optimal blood culture diagnostics have not been performed. We conducted a randomised controlled trial comparing BCID testing with real-time molecular diagnostics and lab call with standard culture and susceptibility testing with templated comments (INT1), or BCID testing with real-time molecular diagnostics and antimicrobial stewardship (INT2) among patients with pathogens on the BCID panel, time from GS result to pathogen identification was shorter in INT1 and INT2 compared to control (23.6 h, p <.001). Among patients with pathogens on the BCID panel, time from GS result to pathogen identification was shorter in INT2 compared to control (23.6 h, p <.001). Time from GS result to pathogen identification was shorter in INT1 and INT2 compared to control (23.6 h, p <.001). Time from GS result to pathogen identification was shorter in INT2 compared to control (23.6 h, p <.001).

Methods: Patients with a positive blood culture (BCID) at Mayo Clinic between April 2015 and August 2016 were randomised to one of the 5 arms. Patients were excluded if they did not receive research consent or if they were ≥ 21. 94.3% of patients remained after exclusions. Results: 177 patients were enrolled (71 INT1, 21 INT2, 81 Control). Median age was 61.4 years (IQR 51.3-71.6). 46% were male, and 62% were white. Among patients on the BCID panel, time from GS result to pathogen identification was shorter in INT2 compared to control (23.6 h, p <.001). Time from GS result to pathogen identification was shorter in INT2 compared to control (23.6 h, p <.001). Time from GS result to pathogen identification was shorter in INT2 compared to control (23.6 h, p <.001). Time from GS result to pathogen identification was shorter in INT2 compared to control (23.6 h, p <.001). Time from GS result to pathogen identification was shorter in INT2 compared to control (23.6 h, p <.001).

Conclusions: Use of the BCID test led to more judicious antibiotic use for patients with bloodstream infections. Use of an optimal rapid diagnostic test led to significantly faster results. Time to GC result in INT2 and INT1 was significantly faster compared to control. Time to GC result in INT2 and INT1 was significantly faster compared to control. Time to GC result in INT2 and INT1 was significantly faster compared to control.

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