Abstract

Background: Antimicrobial resistance is a global health issue exacerbated by the overuse and misuse of antibiotics. Rapid identification of pathogens in bloodstream infections is essential for reducing broad-spectrum antibiotic use and minimizing resistance. The BioFire Blood Culture Identification 2 (BCID2) Panel is a rapid multiplex PCR test that detects 43 common targets associated with bloodstream infections. This study evaluates the impact of the BCID2 Panel, coupled with a pharmacist-driven protocol for antibiotic de-escalation, on patient outcomes and antimicrobial stewardship.

Methods: This single-center, retrospective chart review included patients aged 18 to 89 hospitalized with positive blood cultures at Hospital Sisters Health System St. Elizabeth's Hospital. Data was compared from a period before rapid blood culture diagnostic testing was available (October-December 2023) versus post data using rapid diagnostic technology (March-May 2024). The primary outcome was time to antibiotic de-escalation, defined as the time from starting broad-spectrum antibiotics until intervention or order entry.

Results: A total of 77 participants were included in the primary outcome analysis, with 43 in the pre-BCID2 group and 34 in the post-BCID2 group. The average time to antibiotic de-escalation was significantly shorter in the post-BCID2 group (25.2 hours vs. 51.9 hours, $p<0.001$). Time from initial positive blood culture to de-escalation was also significantly reduced (43 hours vs. 11.2 hours, $p<0.001$). Pharmacists made more interventions of both escalations and de-escalations in the post-BCID2 group. No significant differences were found in length of hospital stay, antibiotic duration, or 30-day mortality. The BCID2 panel showed a 98.5% match with final culture results.

Conclusion: The implementation of the BioFire BCID2 Panel alongside a pharmacist-driven protocol for antibiotic management significantly improved time to de-escalation of antibiotics and supported appropriate therapy adjustments. This approach can enhance antimicrobial stewardship and optimize patient outcomes in the management of bloodstream infections.