Review of Clinical Outcomes in Patients Treated with Beta-lactam vs Non-beta-lactam Therapy for AmpC Producing Bacterial Bloodstream Infections

Background

AmpC beta-lactamase producing organisms are traditionally treated with carbapenem or fluoroquinolone antibiotics. Recent studies, however, describe similar clinical outcomes in patients that receive cefepime or piperacillin/tazobactam. We sought to assess outcomes in patients with bloodstream infections caused by AmpC-producing organisms that received beta-lactams compared non-beta-lactam therapy.

Methods

Data was obtained retrospectively from the electronic health record (EHR) from January 2012 to February 2020. The primary objective was 30-day mortality from the day of first positive blood cultures with *Enterobacter* spp., *Citrobacter* spp., or *Serratia* spp. in patients who received non-beta-lactam therapy (carbapenem, fluoroquinolone, trimethoprim/sulfamethoxazole) to those who received beta-lactam therapy (cefepime, piperacillin/tazobactam). Secondary objectives included 30-day recurrence of bacteremia, pathogen isolated, source of bacteremia, hospital length of stay, and duration of antimicrobial therapy.

Results

A total of 90 patients were included, 50 in the non-beta lactam group and 40 in the beta-lactam group. Demographics were similar between groups. Thirty-day mortality was significantly higher in the beta-lactam group (20% vs 2%, p=0.009). *Enterobacter* spp. was the most frequently identified pathogen (67%), most commonly isolated from a urinary (31%) or intra-abdominal source (22%). The average duration of antibiotic therapy was significantly higher in the non-beta lactam group (18 vs 12 days, p=0.001). In contrast, there was no significant difference found in hospital length of stay, recurrence of bacteremia, pathogen isolated or source of bacteremia between groups.

Conclusion

Beta-lactam therapy for the treatment of bloodstream infections caused by Amp-C producing organisms was associated with significantly greater 30-day mortality compared to patients that received non-beta-lactam therapy.