# Review of Clinical Outcomes in Patients Treated with β-Lactam vs. Non-β-Lactam Antibiotics for AmpC-Producing Bloodstream Infections

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**Background**

- Infections caused by AmpC-producing organisms are traditionally treated with carbapenems or fluoroquinolones
- Recent studies describe similar clinical outcomes in patients that receive cefepime or piperacillin/tazobactam
- We sought to assess outcomes in patients with bloodstream infections (BSI) caused by AmpC-producing organisms that received beta-lactams compared non-beta-lactam therapy.

**Methods**

- Retrospective chart review of patients with *Enterobacter, Serratia, and Citrobacter* spp bloodstream infection between January 2012 and February 2020
- Patients were stratified into the beta-lactam (BL) group (piperacillin/tazobactam (P/T) or cefepime) or non-beta-lactam (NBL) group (carbapenem, fluoroquinolone (FQ), or trimethoprim/sulfamethoxazole (T/S)) based on definitive 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).
- The average duration of antibiotic therapy was significantly higher in the non-beta lactam group (18 vs 12 days, *p*=0.001).
- There was no significant difference found in hospital length of stay, recurrence of bacteremia, pathogen isolated or source of bacteremia between groups

**Conclusions**

- 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.

We observed a **significantly higher mortality** rate in patients that received **β-lactam antibiotics** versus non-β-lactam antibiotics for the treatment of **bacteremia** caused by **AmpC-producing** organisms

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**Table 1: Infection-Related Characteristics**

| | BL Group N=40 | NBL Group N=50 | p-Value |
|---|---|---|---|
| **Most common sources** | | | |
| Urinary, n (%) | 8 (20) | 20 (40) | 0.066 |
| Intra-abdominal, n (%) | 8 (20) | 12 (24) | 0.800 |
| **Organism, n (%)** | | | |
| *Enterobacter* spp | 22 (55) | 32 (64) | 0.397 |
| *Serratia* spp | 15 (37.5) | 11 (22) | 0.084 |
| *Citrobacter* spp | 3 (7.5) | 7 (14) | 0.502 |

**Definitive Therapy**

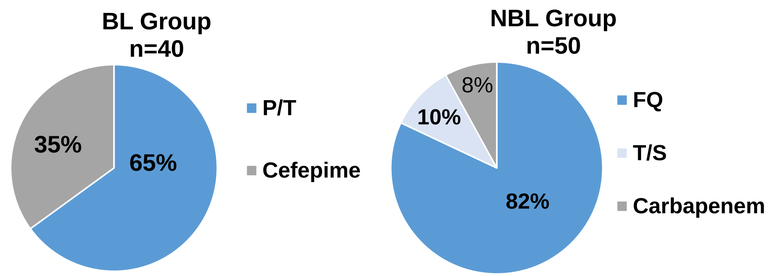


**Table 2: Outcome Measurements**

| | BL Group N=40 | NBL Group N=50 | p-Value |
|---|---|---|---|
| **Primary Outcome** | | | |
| **30-Day all-cause mortality, n (%)** | 8 (20.0) | 1 (2.0) | 0.009 |
| **Secondary Outcomes** | | | |
| **Total antibiotic days, n (%)** | 12.2 (6.81) | 18.46 (11.21) | 0.001 |
| **Recurrence of BSI, n (%)** | 7 (17.5) | 4 (8) | 0.206 |
| **Hospital length of stay, n (%)** | 20.73 (25.15) | 13.72 (16.82) | 0.119 |

**Cause of 30-Day Mortality**