

Table 3. Multivariate logistic regression analysis for risk factors for in-hospital mortality

Parameter	Odds Ratios (95% CI)
Acute kidney injury	30.9 (2.8 - 334.7)
Septic shock	143.5 (4.5 - 4,541)
Native heart valve	2.0 (0.13 - 30.6)
Gram-positive bacterial etiology	1.9 (0.2 - 16.8)
Glycopeptides based antibiotic regimen	0.49 (0.03 - 6.7)

Disclosures. All authors: No reported disclosures.

164. Analysis of Adult, Hospitalized Patients With Carbapenem-resistant (CR) Gram-Negative Bloodstream Infections (GN-BSIs) due to Lactose Fermenters (LFs) and Non-lactose Fermenters (NLFs): Is There a Difference in Outcomes? Thomas Lodise, PharmD, PhD¹; Hemanth Kanakamedala, BS² and Wei-Chun Hsu, MS³; Bin Cai, MD, PhD⁴; ¹Albany College of Pharmacy and Health Sciences, Albany, New York; ²Genesis Research Inc., Hoboken, New Jersey; ³Genesis Research Inc., Hoboken, New Jersey; ⁴Shionogi, Inc., Florham Park, New Jersey

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Background. The deleterious consequences of BSIs due to CR-GN bacteria among hospitalized adult patients are well described in the literature. However, scant data exist that compares the baseline features and outcomes of patients with CR-GN-BSIs due to LFs relative to those caused by NLFs.

Methods. We performed a retrospective cohort analysis of consecutive hospitalized adult patients (age ≥18 years) in the Premier Healthcare Database (January 2014–June 2018) with GN-BSI due to select LFs (*E. coli*, *Klebsiella* spp., *Citrobacter* spp., *Enterobacter* spp., and *Serratia* spp.) and NLFs (*Pseudomonas* spp., *Acinetobacter* spp., and *Stenotrophomonas* spp.). Patients with a diagnosis of cystic fibrosis or who had both LF and NLF GNB on index BSI culture were excluded. Baseline demographics, medical history, comorbidities, hospitalization history, and outcomes were compared between patients with CR-GNB due to LFs and NLFs. Outcomes assessed included composite death (in-hospital death or discharge to hospice), in-hospital mortality, discharge to home, and hospital length of stay post index GNB-BSI culture collection.

Results. Of the 1749 patients with a CR-GNB-BSI due to an LF or NLF, 1505 met study criteria. Of the 1505, 418 (27.8%) were LFs and 1087 (72.2%) were NLFs. The most common LFs were *Klebsiella* spp. (55.7%) and *Enterobacter* spp. (25.7%), while *Stenotrophomonas* spp. (45.2%) was the most common NLF. Overall, groups were highly similar at baseline but patients with CR-GNB-BSIs due to an LF were slightly older and more likely to be in the ICU at index BSI culture collection (table). Outcomes were also comparable between patients with CR-GNB-BSIs due to LFs and NLFs but there were a few notable differences. Composite mortality was higher in patients with GNB-BSIs due to an LF and these patients were also less likely to be discharged home.

Conclusion. The findings indicate that CR-GNB-BSIs result in considerable morbidity and mortality irrespective of whether the GNB is an LF or NLF. One in five patients died during their hospitalization and less than half were discharged home. This highlights the need for better and more preventive and therapeutic strategies aimed at combating CR-GNB-BSIs.

Table. Baseline characteristics and outcomes between patients with CR-GNB-BSI due to LF or NLF	Lactose Fermenters (N=418)		Non-lactose Fermenters (N=1087)	
	N	%	N	%
Baseline characteristics				
Age in years	63.32 (15.58)		58.64 (17.11)	
Mean (Std Dev)				
Sex	191 45.69%		497 45.72%	
Female				
Baseline CCI Score	3 (2-6)		3 (1-5)	
Median (Q1-Q3)				
Days between admission and index culture^[1]	127 30.38%		357 32.84%	
>3 days				
Admission source	295 70.6%		760 69.9%	
Non-healthcare facility point of origin				
ICU at index culture	181 43.3%		351 32.3%	
Pathogen^[2]				
<i>Acinetobacter</i> spp.	0	0.0%	190	17.4%
<i>Citrobacter</i> spp.	10	2.4%	0	0.0%
<i>E. coli</i>	57	13.6%	0	0.0%
<i>Enterobacter</i> spp.	108	25.7%	0	0.0%
<i>Klebsiella</i> spp.	234	55.7%	0	0.0%
<i>Pseudomonas</i> spp.	0	0.0%	410	37.5%
<i>Serratia</i> spp.	11	2.6%	0	0.0%
<i>Stenotrophomonas</i> spp.	0	0.0%	494	45.2%
Outcomes				
Composite death	120	28.7%	259	23.8%
In-hospital mortality	94	22.5%	218	20.1%
Home discharge	118	28.2%	450	41.4%
Infection-associated length of stay	8 (4-14)		7 (4-12)	
Median (Q1-Q3)				
[1] Day between admission and index culture. Number of days between admission and index culture day, calculated as index culture day-admission day +1. For example, 2 days represent having index culture one day after admission.				
[2] Pathogen at index culture. Patients could have more than one pathogen present at index culture.				

Disclosures. All authors: No reported disclosures.

165. Comparative Effectiveness of Oral Fluoroquinolones vs. β-Lactams for the Treatment of Patients with Enterobacteriaceae Bloodstream Infections

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Background. Fluoroquinolones (FQ) are associated with unacceptable rates of adverse drug events (ADE) and drug resistance. Safe and effective alternative oral agents are needed for definitive treatment of *Enterobacteriaceae* bloodstream infections (BSI). This study aims to determine whether treatment failure rates were similar in patients who received FQ or β-lactams (BL) for stepdown treatment of *Enterobacteriaceae* BSI.

Methods. We conducted a retrospective cohort study comparing oral BL vs. FQ as definitive therapy for patients with BSI due to *Escherichia coli*, *Klebsiella* spp., or *Proteus* spp. Eligible patients were ≥18 years old with a monomicrobial BSI treated with a single definitive oral antibiotic. Patients with a total antibiotic treatment duration of <6 or >21 days were excluded. Groups were matched based on age and gender. The primary outcome was treatment failure defined as recurrence or all-cause mortality within 90 days with a 10% non-inferiority margin. Secondary outcomes were death or recurrence within 30 and 90 days, symptomatic urinary tract infection (UTI) or BSI within 30 days, and the safety outcome of antibiotic-related ADE.

Results. The average age was 68 years, with 94% males. In the BL group, 80% had a urinary source of infection vs. 69% of the FQ group. The majority of patients had source control (88% of BL group vs. 83% of FQ group). The most common pathogens were *E. coli* (66%) and *K. pneumoniae* (24%). Cefpodoxime (71%) and ciprofloxacin (85%) were the most commonly used oral antibiotics. The average duration of oral therapy was 9.2 vs. 9.6 days and total duration was 14.4 vs. 13.9 days in the BL vs. FQ group, respectively. The primary outcome occurred in 15.4% of the BL group vs. 12.3% of the FQ group ($P = 0.8002$, RR = 0.80, 95% CI = 0.33–1.90). No deaths were directly attributed to infection. Symptomatic UTI or BSI within 30 days occurred in 20% of BL patients vs. 21.5% of FQ patients ($P = 1.0000$, RR = 1.07, 95% CI = 0.55–2.11). Mortality or recurrence at 30 days were similar between groups (4.6% of BL group vs. 9.2% of FQ group, $P = 0.4920$, RR = 2.00, 95% CI = 0.52–7.66). One FQ patient experienced an antibiotic-related ADE (*C. difficile* infection).

Conclusion. BL are non-inferior to FQ and appear to be as effective for oral step-down treatment of *Enterobacteriaceae* BSI without the associated risks.

Disclosures. All authors: No reported disclosures.

166. Comparison of Oral Fluoroquinolones to Alternative Oral Agents for Definitive Step-Down Therapy in Gram-Negative Bloodstream Infections

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Background. During the management of Gram-negative bloodstream infections (GN BSIs), definitive oral step-down therapy is often utilized. Fluoroquinolones (FQs) are commonly utilized due to excellent bioavailability; however, comparative evidence to oral trimethoprim/sulfamethoxazole (TMP/SMX) or β-lactams (BLs) are limited.

Methods. This multicenter, retrospective cohort included patients ≥18 years of age who had a GN BSI and received oral FQ, BL, or TMP/SMX as definitive oral step-down therapy for >33% of their total treatment duration. Patients were excluded if received <7 days or >17 days of total therapy, or had polymicrobial bacteremia. The primary outcome was treatment failure within 90 days. Treatment failure was a composite endpoint including both all-cause mortality and recurrence of infection. Secondary outcomes included all-cause and infection-related readmissions at 30 days.

Results. A total of 220 patients were included (FQ $n = 106$, BL $n = 96$, SMX/TMP $n = 18$). Patients were elderly (median age 70 years; IQR 59–79) and had a median Pitt bacteremia score of 1 (IQR 0–2). The most common pathogens were *E. coli* (58.2%) and *K. pneumoniae* (17.3%) and the primary source of infection was urinary (70%). Majority of BL use consisted of cephalixin (44.7%) and cefuroxime (21.3%) while FQ use was mostly ciprofloxacin (69.8%). Infectious diseases consultations were associated with 52.8%, 39.6%, and 72.2% of the prescribed FQ, BL, and SMX/TMP, respectively. Overall median intravenous, oral, and total effective antibiotic durations were 3.9, 9, and 13 days, respectively, and were similar between each group. Ninety day treatment failure rates were 9.5% in the FQ group vs. 14.6% in the BL group ($P = 0.27$) and 0% in the TMP/SMX group ($P = 0.35$). All-cause and infection-related readmissions were similar between FQ, BL, and TMP/SMX: (25.5%, 27.1%, 16.7%; $P = 0.73$) and (4.7%, 5.2%, 5.6%; $P = 1.0$), respectively.

Conclusion. We identified similar treatment failure rates between oral FQs, BLs, and TMP/SMX. Oral step-down therapy with BLs may be a promising