

288. Follow-Up Blood Cultures in Gram-Negative Bacteremia: How Do They Impact Outcomes

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Session: P-9. Bacteremia

Background: As opposed to *Staphylococcus aureus* bacteremia, there are no guidelines to recommend repeating blood cultures in Gram-negative bacilli bacteremia (GNB). Several studies have questioned the utility of follow-up blood cultures (FUBCs) in GNB, but the impact of this practice on clinical outcomes is not fully understood.

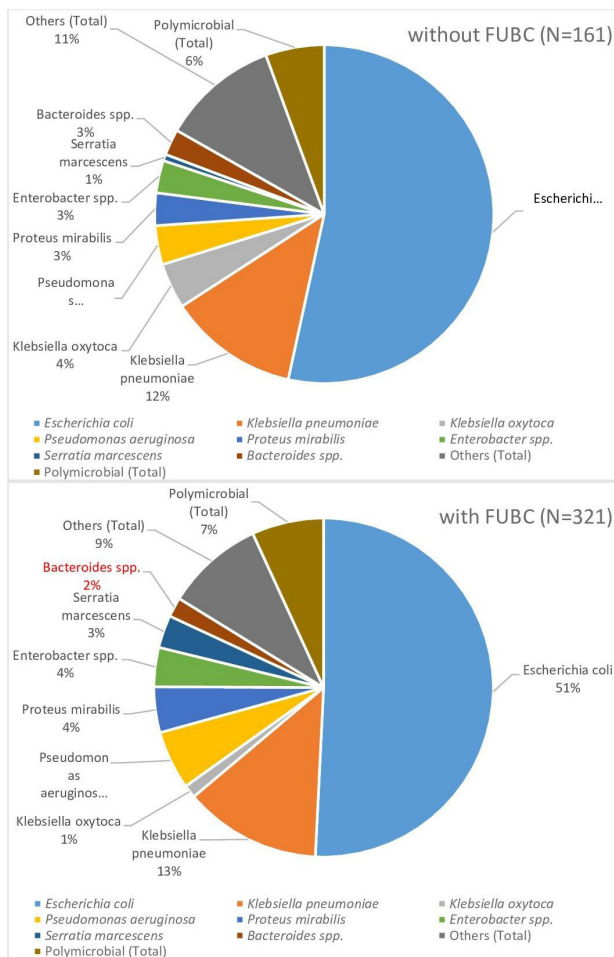
Our aim was to study the practice of obtaining FUBCs in GNB at our institution and to assess its impact on clinical outcomes.

Methods: We conducted a retrospective, single-center study of adult patients, ≥ 18 years of age admitted with GNB between January 2017 and December 2018. We aimed to compare clinical outcomes in those with and without FUBCs. Data collected included demographics, comorbidities, presumed source of bacteremia and need for intensive care unit (ICU) admission. Presence of fever, hypotension /shock and white blood cell (WBC) count on the day of FUBC was recorded. The primary objective was to compare 30-day mortality between the two groups. Secondary objectives were to compare differences in 30-day readmission rate, hospital length of stay (LOS) and duration of antibiotic treatment.

Mean and standard deviation were used for continuous variables, frequency and proportion were used for categorical variables. P-value < 0.05 was defined as statistically significant.

Results: 482 patients were included, and of these, 321 (67%) had FUBCs. 96% of FUBCs were negative and 2.8% had persistent bacteremia. There was no significant difference in 30-day mortality between those with and without FUBCs (2.9% and 2.7% respectively), or in 30-day readmission rate (21.4% and 23.4% respectively). In patients with FUBCs compared to those without FUBCs, hospital LOS was longer (7 days vs 5 days, P < 0.001), and mean duration of antibiotic treatment was longer (14 days vs 11 days, P < 0.001). A higher number of patients with FUBCs needed ICU care compared to those without FUBCs (41.4% and 25.5% respectively, P < 0.001)

Microbiology of index blood culture in those with and without FUBCs



Outcomes in those with and without FUBCs

Table 1: Outcomes

Variable	with FUBC (N = 321)	without FUBC (N = 161)	p-value
30-day mortality	9 (2.9%)	4 (2.7%)	> 0.999
Re-admission within 30 days	67 (21.4%)	37 (23.4%)	0.704
Length of stay	7 [5, 11]	5 [4, 7]	< 0.001
Duration of antibiotic treatment	14 [10, 14]	11 [10, 14]	< 0.001
Needed Intensive Care	133 (41.4%)	41 (25.5%)	< 0.001

Note. P-values come from Mann-Whitney U and χ^2 -tests depending on the distribution of the variable.

FUBCs characteristics

Table 2: FUBC Characteristics

Variable	N = 321
Mean number of FUBC	1.19 (SD 0.44)
Negative FUBC	309 (96.3%)
Positive FUBC	
Same pathogen (persistent bacteremia)	9 (2.8%)
Different pathogen	2 (0.6%)
Contaminant	1 (0.3%)
At time of FUBC	
Fever (>100.3 °F)	47 (14.6%)
Hypotension (SBP < 90, or on vasopressors)	22 (6.9%)
Mean WBC count	12 (SD 6.74)
Recorded reason for obtaining FUBC	91 (28.5%)
To document clearance	69 (75.8%)
Fever	18 (19.8%)
Others (leukocytosis, high lactate, unclear source)	4 (4.4%)

Note. P-values come from t-tests, chi-squared tests, and Fisher's exact tests depending on the distribution of the variable.

Conclusion: Obtaining FUBCs in GNB had no impact on 30-day mortality or 30-day readmission rate. It was associated with longer LOS and antibiotic duration. Our findings suggest that FUBCs in GNB are low yield and may not be recommended in all patients. Prospective studies are needed to further examine the utility of this practice in GNB.

Disclosures: All Authors: No reported disclosures

289. Impact of Clinician Specialty on the Use of Oral Antibiotic Therapy for Definitive Treatment of Uncomplicated Bloodstream Infections

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Session: P-9. Bacteremia

Background: No established guidelines exist regarding the role of oral antibiotic therapy (OAT) to treat uncomplicated bloodstream infections (uBSIs) and practices may vary depending on clinician specialty and experience.

Methods: An IRB-exempt web-based survey was emailed to Nebraska Medicine clinicians caring for hospitalized patients, and widely disseminated using social media. The survey was open access and once disseminated on social media, it was impossible to ascertain the total number of individuals who received the survey. Chi-squared analysis for categorical data was conducted to evaluate the association between responses and demographic groups.

Results: Of 275 survey responses, 51% were via social media, and 94% originated in the United States. Two-thirds of respondents were physicians, 16% pharmacists, and infectious diseases clinicians (IDC) represented 71% of respondents. The syndromes where most were comfortable using OAT routinely for uBSI were urinary tract infection (92%), pneumonia (82%), pyelonephritis (82%), and skin/soft tissue infections (69%). IDC were more comfortable routinely using OAT to treat uBSIs associated with vertebral osteomyelitis and prosthetic joint infections than non-infectious diseases clinicians (NIDC), but NIDC were more likely to report comfort with routine use of OAT to treat uBSIs associated with meningitis and skin/soft tissue infections. IDC were more likely to report comfort with routine use of OAT for uBSIs due to *Enterobacteriaceae* and gram-positive anaerobes, while NIDC were more likely to be comfortable with routinely using OAT to treat uBSIs associated with *S. aureus*, coagulase-negative staphylococci and gram-positive bacilli. In one clinical vignette of *S. aureus* uBSI due to debrided abscess, 11% of IDC would be comfortable using OAT vs 28% of NIDC; IDC were more likely to report routinely repeating blood cultures (99% vs 83%, p< 0.05).

Figure 1: Clinician comfort using oral antibiotic therapy to treat uncomplicated bacteremia due to specific syndromes

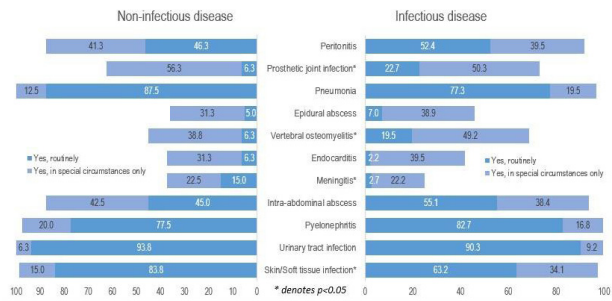
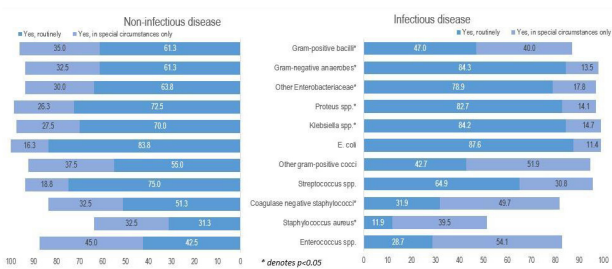


Figure 2: Clinician comfort using oral antibiotic therapy to treat uncomplicated bacteremia due to specific organisms



Conclusion: Considerable variation in comfort using OAT for uBSIs among IDC vs NIDC exists, highlighting opportunities for IDC to continue to demonstrate their value in clinical practice. Understanding the reasons for variability may be helpful in creating best practice guidelines to standardize decision making.

Disclosures: All Authors: No reported disclosures

290. Impact of follow up blood cultures on outcomes of patients with gram-negative bloodstream infections

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Session: P-9. Bacteremia

Background: Importance of follow up blood cultures (FUBC) for *Staphylococcus aureus* bloodstream infections (BSI) is well known, but the role of FUBC in gram-negative BSI remains controversial. This retrospective cohort study examined the association between obtaining FUBC and mortality in patients with gram-negative BSI.

Methods: Adults with first episodes of community-onset monomicrobial BSI due to gram-negative bacilli hospitalized at Prisma Health-Midlands hospitals in Columbia, South Carolina, USA from January 1, 2010 to June 30, 2015 were identified. Patients who died or were discharged from hospital within 72 hours of collection of index blood culture were excluded to minimize impact of survival and selection biases on results, respectively. FUBC were defined as repeat blood cultures obtained between 24 and 96 hours from initial positive blood culture. Cox proportional hazards regression model was used to examine association between obtaining FUBC and 28-day all-cause mortality.

Results: Among 766 patients with gram-negative BSI, 219 (28.6%) had FUBC obtained and 15 of 219 (6.8%) FUBC were persistently positive. Overall, median age was 67 years, 438 (57%) were women, 457 (60%) had urinary source of infection, and 426 (56%) had BSI due to *Escherichia coli*. Mortality was significantly lower in patients who had FUBC obtained than in those who did not have FUBC (6.3% vs. 11.7%, log-rank p=0.03). Obtaining FUBC was independently associated with reduced mortality (hazards ratio [HR] 0.49, 95%CI: 0.25–0.90) after adjustments for age (HR 1.35 per decade, 95% CI: 1.13–1.61), cancer (HR 5.90, 95% CI: 3.53–9.84), Pitt bacteremia score (HR 1.38 per point, 95% CI: 1.26–1.50), and inappropriate empirical antimicrobial therapy (HR 2.37, 95% CI: 1.17–4.39).

Conclusion: Obtaining FUBC was associated with improved survival in hospitalized patients with gram-negative BSI. These observations are consistent with the results of recent publications from Italy and North Carolina supporting utilization of FUBC in the management of gram-negative BSI.

Disclosures: Julie Ann Justo, PharmD, MS, BCPS-AQ ID, bioMerieux (Speaker's Bureau) TRC Healthcare (Speaker's Bureau)

291. Impact of Surveillance and Offered Infectious Diseases Consults for *Staphylococcus aureus* Bacteremia on Quality of Care Indicators

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Session: P-9. Bacteremia

Background: *Staphylococcus aureus* bacteremia (SAB) remains the leading cause of bloodstream infections and is associated with 20–40% mortality. Past studies demonstrated that Infectious Diseases (ID) consultation is associated with better adherence to quality of care indicators (QCI), including follow-up blood cultures, echocardiography, early source control, and appropriate choice and duration of antibiotics. A 2014 quality improvement project at Medstar Washington Hospital Center (MWHC) by Narsana et al. showed significantly better adherence to SAB QCI among patients with ID consults and a non-significant trend towards lower mortality. In 2015, MWHC instituted a policy advocating ID consultation for all SAB patients, and active surveillance was performed by the ID Section to offer prompt consults prospectively. Our study aimed to assess the impact of this policy and the proactively offered ID consults on adherence to SAB QCI and mortality rates amongst patients with SAB with and without ID consults.

Methods: We retrospectively reviewed 557 patients diagnosed with SAB between July 1st, 2015 - June 30th, 2018. Data included follow-up blood cultures, echocardiography, presence of a focal source of infection, use of appropriate antibiotics, measurement of vancomycin levels, duration of therapy, death during hospitalization, and presence of an ID consultation. Chi-Square and Fisher exact tests, and t-test and Wilcoxon rank sum test were used to analyze categorical and continuous variables, respectively.

Results: A total of 513 patients were included in the analysis, 88% (n=453) of whom had ID consultations. Patients with ID consultations were more likely to have a focal source of infection (84% vs. 50%, p < 0.0001), echocardiography (97% vs. 56%, p < 0.0001), use of a beta-lactam antibiotic for methicillin-susceptible *S. aureus* (90% vs. 65%, p < 0.0001), and a longer duration of therapy (33 vs 9 days, p < 0.0001). Mortality was lower among patients with ID consults (16% vs. 23%, p=0.1495), but the difference was not statistically significant.

Table 1

Variables	Was an Infectious Diseases consultation obtained?		p-value
	Yes	No	
Were follow-up blood cultures done demonstrating clearance?			
Yes	423 (93.38%)	52 (88.14%)	0.1436
No	30 (6.62%)	7 (11.86%)	
Was a focal source of infection present?			
Yes	383 (84.55%)	30 (50%)	<0.0001
No	70 (15.45%)	30 (50%)	
If yes, was the focal source of infection removed?			
Yes	263 (78.04%)	16 (94.12%)	0.1375
No	74 (21.96%)	1 (5.88%)	
Was echocardiography performed?			
Yes	441 (97.35%)	34 (56.67%)	<0.0001
No	12 (2.65%)	26 (43.33%)	
Was a beta-lactam antibiotic used if MSSA?			
Yes	199 (90.45%)	27 (65.85%)	<0.0001
No	21 (9.55%)	14 (34.15%)	
If Vancomycin was used, was a trough of 15-20 documented during therapy?			
Yes	192 (88.07%)	18 (78.26%)	0.1813
No	26 (11.93%)	5 (21.74%)	
Did the patient die during hospitalization?			
Yes	72 (15.93%)	14 (23.33%)	0.1495
No	380 (84.07%)	46 (76.67%)	
Was the death attributable to this infection?			
Yes	49 (63.64%)	6 (42.86%)	0.1436
No	28 (36.36%)	8 (57.14%)	
Duration of therapy	32.91 (13.92)	9.25 (7.75)	<0.0001

Conclusion: Our study demonstrates that ID consultation is associated with better adherence to SAB QCI, with a trend towards lower mortality. Hospital systems should support mandatory ID consultation for patients with *Staphylococcus aureus* bacteremia.

Disclosures: All Authors: No reported disclosures

292. Impact of the BACT/ALERT VIRTUO blood culture system in the management of *Staphylococcus aureus* bacteremia

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Session: P-9. Bacteremia

Background: *Staphylococcus aureus* bacteremia (SAB) is a major cause of mortality. Recovery of SA may be enhanced with new blood culture systems resulting in a longer observed duration of bacteremia.

Methods: We performed a 24-month retrospective study of adults hospitalized with SAB at a 1250-bed academic hospital. Between 1/2018-12/2018 the VersaTREK system was used and 1/2019-12/2019 the BACT/ALERT VIRTUO (VIRTUO) system was used. We excluded patients without an Infectious Diseases (ID) consult. We defined