Material Support, Conducted clinical trials and studies in which participating hospitals and nursing homes received contributed antiseptic product) **Xttrium** (Other Financial or Material Support, Conducted clinical trials and studies in which participating hospitals and nursing homes received contributed antiseptic product) **Shruti K. Gohil, MD, MPH**, **Medline** (Other Financial or Material Support, Co-Investigator in studies in which participating hospitals and nursing homes received contributed antiseptic and cleaning products) **Molnycke** (Other Financial or Material Support, Co-Investigator in studies in which participating hospitals and nursing homes received contributed antiseptic and cleaning products) **Stryker (Sage)** (Other Financial or Material Support, Co-Investigator in studies in which participating hospitals and nursing homes received contributed antiseptic and cleaning products) **Susan S. Huang, MD, MPH**, **Medline** (Other Financial or Material Support, Conducted studies in which participating hospitals and nursing homes received contributed antiseptic and cleaning products) **Molnlycke** (Other Financial or Material Support, Conducted studies in which participating hospitals and nursing homes received contributed antiseptic and cleaning products) **Stryker (Sage)** (Other Financial or Material Support, Conducted studies in which participating hospitals and nursing homes received contributed antiseptic and cleaning products)**Xttrium** (Other Financial or Material Support, Conducted studies in which participating hospitals and nursing homes received contributed antiseptic and cleaning products)

6. *Staphylococcus aureus* in a Single Blood Culture Bottle: Should We be Concerned?

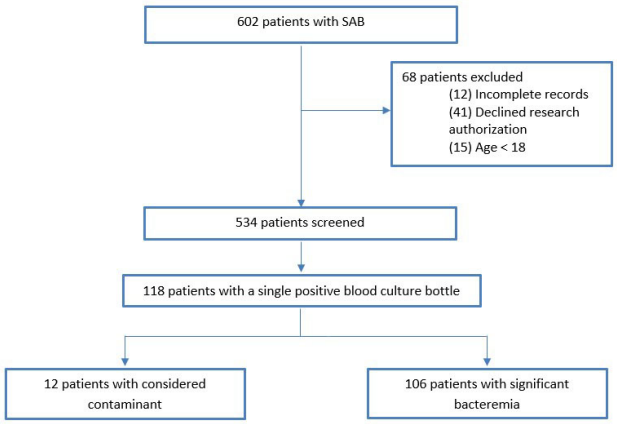
John Raymond U. Go, MD[1]; Douglas Challener, M.D.[1]; Cristina G. Corsini Campioli, MD[2]; Muhammad R. Sohail, MD[3]; Raj Palraj, MD[2]; Larry M. Baddour, MD[4]; Omar Abu Saleh, M.B.B.S[2]; [1]Mayo Clinic Rochester, Rochester, MN; [2]Mayo Clinic, Rochester, Minnesota; [3]Baylor College of Medicine, Houston, Texas; [4]Mayo Clinic College of Medicine, Rochester, MN

Session: O-02. Blood Stream Infections and Sepsis

Background. *Staphylococcus aureus* bacteremia (SAB) is common and is characterized by high rates of morbidity and mortality. The clinical importance of a single positive blood culture bottle (SPBCB), however, is poorly defined despite it being a frequent laboratory finding. We therefore examined patients with SPBCB to determine its clinical significance and to understand the rationale of current practice.

Methods. We performed a retrospective, multicenter study of patients with a SPBCB for *S. aureus* in initial cultures from January 2019 to December 2019 using data collected from both electronic health records and the clinical microbiology laboratory.

Figure 1. Study Population



Results. Overall, 534 patients with SAB were identified, and 118 (22.1%) had a SPBCB. Among SPBCB cases, 106 (89.3%) were classified as clinically significant while 12 were considered contaminated or of unclear clinical significance. Baseline characteristics were similar between the groups (Table 1). A majority (92.4%) received antibiotic therapy, but patients with clinically significant bacteremia were treated with a longer antibiotic course (25.9 vs 5.7 days, p< 0.001). Outcomes between those with SPBCB (contaminant vs clinically significant) were similar (Table 2). Of note, while there was no difference in use of echocardiography based on PREDICT criteria between the clinically significant SPBCB vs. the multiple positive blood culture bottles (MPBC) cohorts (Table 3), significant differences were seen in both frequency of echocardiography (65.1% vs. 84.6%, P< 0.001) and IE diagnosis (3.8% vs. 14.2%, P=0.002) for patients in the SPBCB vs. MPBC groups, respectively. In addition, those with MPBC had higher 90-day, 6-month and 1-year mortality rates.

Table 1. Clinical features of patients with a single positive culture considered a contaminant/unclear significance vs clinically significant.

Characteristic	Contaminant/unclear significance (n=12)	Significant (n=106)	Total (n=118)	P-value
Age, years, mean (SD)	55.1 (16.9)	63.5 (17.6)	62.7 (17.6)	0.091[1]
Male, n (%)	6 (50.0)	59 (55.6)	65 (55.1)	0.766[2]
Body mass index, kg/m², mean (SD)	27.7 (9.2)	30.5 (9.5)	30.2 (9.5)	0.273[1]
Charlson comorbidity index, mean (SD)	3.7 (1.6)	5.1 (3.3)	4.9 (3.2)	0.112[1]
Comorbidities, n (%)				
Injection drug use	0	5 (4.7)	5 (4.2)	1.000[2]
Myocardial infarction	1 (8.3)	26 (24.5)	27 (22.9)	0.292[2]
Congestive heart failure	2 (16.7)	28 (26.4)	30 (25.4)	0.728[2]
Peripheral vascular disease	0	14 (13.2)	14 (11.9)	0.356[2]
Chronic obstructive pulmonary disease	1 (8.3)	17 (16.0)	18 (15.3)	0.690[2]
Connective tissue disease	2 (16.7)	8 (7.5)	10 (8.5)	0.269[2]
Liver disease	1 (8.3)	9 (8.5)	10 (8.5)	1.000[2]
Diabetes mellitus	2 (16.7)	54 (50.9)	56 (47.5)	0.102[2]
Moderate to severe chronic kidney disease[a]	3 (25.0)	25 (23.6)	28 (23.7)	1.000[2]
Malignancy	3 (25.0)	23 (21.7)	26 (22.0)	0.725[2]
Cardiac prosthetic device	0	9 (8.5)	9 (7.6)	0.595[2]
Prosthetic valve	0	3 (2.8)	3 (2.5)	1.000[2]
Permanent pacemaker	0	4 (3.8)	4 (3.4)	1.000[2]
AICD	0	1 (0.9)	1 (0.8)	1.000[2]
CRT	0	1 (0.9)	1 (0.8)	1.000[2]
VAD	0	1 (0.9)	1 (0.8)	1.000[2]
MRSA	2 (16.7)	29 (27.4)	31 (26.3)	0.730[2]
Acquisition				1.000[2]
Community, n (%)	5 (41.7)	39 (36.8)	44 (37.3)	
Healthcare-associated, n (%)	7 (58.3)	62 (58.5)	69 (58.5)	
Nosocomial, n (%)	0	5 (4.7)	5 (4.2)	
ICU admission	2 (16.7)	25 (23.8)	27 (23.1)	0.096[2]
Duration of symptoms > 7 days, n (%)	2 (16.7)	44 (41.5)	46 (39.0)	0.124[2]
Daily blood cultures	4 (33.3)	72 (67.9)	76 (64.4)	**0.026[2]**
Duration of BSI, mean (SD)	1.8 (0.9)	1.8 (1.3)	1.8 (1.2)	0.570[1]
% of patients w/ BSI > 72 hours	1 (10.0)	14 (15.1)	15 (14.6)	1.000[2]
Time to positivity, median hours [IQR]	21.2 (11.1)	25.0 (15.3)	24.6 (15.0)	0.223[1]
PREDICT score day 1, mean (SD)	1.4 (0.5)	1.4 (0.8)	1.4 (0.8)	0.803[1]
PREDICT score day 5, mean (SD)	1.4 (0.5)	1.8 (1.1)	1.7 (1.1)	0.376[1]
Complicated bacteremia, n (%)	3 (25.0)	56 (52.8)	59 (50.0)	0.125[2]
Infective endocarditis	0	4 (3.8)	4 (3.4)	1.000[2]
Osteomyelitis	1 (8.3)	13 (12.3)	14 (11.9)	1.000[2]
Number of patients treated	8 (66.7)	101 (95.3)	109 (92.4)	**0.006[2]**
Inpatient IV antimicrobial duration, mean (SD)	5.4 (2.1)	9.0 (6.7)	8.7 (6.5)	0.144[1]
Outpatient IV antimicrobial duration, mean (SD)	5.5 (2.1)	21.5 (15.4)	21.0 (15.4)	0.051[1]
Outpatient oral antimicrobial duration, mean (SD)	4.7 (3.2)	32.7 (44.1)	29.6 (42.4)	**0.020[1]**
Total antibiotic duration, mean (SD)	5.7 (5.0)	25.9 (21.6)	23.8 (21.4)	**< 0.001[1]**

[1] Kruskal-Wallis rank sum test
[2] Fisher's Exact Test for count data
Data presented in means (standard deviation) or no. (%).
Abbreviations: BSI, bloodstream infection; IR, interventional radiology; IV, intravenous; MIC, minimal inhibitory concentration; n, number.
[a]Moderate = creatinine >3 mg/dL (0.27 mmol/L). Severe = on dialysis, status post kidney transplant, uremia.

Table 2. Comparison of outcomes in patients with a single positive culture considered a contaminant or of unclear significance compared with those considered clinically significant

Characteristic	Contaminant, Single Positive (n=12)	Clinically Significant, Single Positive (n=106)	Total (n=118)	P-value
Hospital length of stay, days, mean (SD)	6.6 (7.0)	9.7 (9.0)	9.45 (8.8)	0.229[1]
Mortality, n (%)	4 (33.3)	31 (29.5)	35 (29.9)	0.750[2]
30-day mortality	0	15 (14.2)	15 (12.7)	0.359[2]
60-day mortality	0	18 (17.0)	18 (15.3)	0.209[2]
90-day mortality	0	18 (17.0)	18 (15.3)	0.209[2]
6-month mortality	1 (8.3)	23 (21.7)	24 (20.3)	0.455[2]
1-year mortality	1 (8.3)	28 (26.4)	29 (24.6)	0.289[2]
90-day relapse, n (%)	0	1 (0.9)	1 (0.8)	1.000[2]

[1] Kruskal-Wallis rank sum test
[2] Fisher's Exact Test for count data

Table 3. Comparison of outcomes in patients with clinically significant single positive culture compared with those with multiple positive cultures

Characteristic	Clinically Significant, Single Positive (n=106)	Multiple Positives (n=416)	Total (n=522)	P-value
Hospital length of stay, days, mean (SD)	9.7 (9.0)	13.0 (14.3)	12.3 (13.5)	0.2291
Mortality, n (%)	31 (29.5)	174 (41.8)	205 (39.3)	0.025[2]
30-day mortality	15 (14.2)	79 (19.0)	94 (18.0)	0.321[2]
60-day mortality	18 (17.0)	100 (24.0)	118 (22.6)	0.152[2]
90-day mortality	18 (17.0)	111 (26.7)	129 (24.7)	**0.043[2]**
6-month mortality	23 (21.7)	132 (31.7)	155 (29.7)	**0.044[2]**
1-year mortality	28 (26.4)	158 (38.0)	186 (35.6)	**0.031[2]**
90-day relapse, n (%)	1 (0.9)	18 (4.3)	19 (3.6)	0.143[2]
Echocardiogram needed based on PREDICT	53 (53.0)	243 (60.3)	296 (58.9)	0.212[2]
Echocardiogram performed	69 (65.1)	351 (84.6)	420 (80.6)	**< 0.001[2]**
Transthoracic (TTE)	55 (51.9)	268 (64.4)	323 (61.9)	**0.019[2]**
Transesophageal (TEE)	26 (24.5)	205 (49.4)	231 (44.3)	**< 0.001[2]**
Infective endocarditis	4 (3.8)	59 (14.2)	63 (12.1)	**0.002[2]**

[1] Kruskal-Wallis rank sum test
[2] Fisher's Exact Test for count data

Conclusion. SPBCB was documented in almost one-quarter of SAB cases and should trigger a thorough investigation as its associated mortality was high and complications, including IE, occurred. Although some SPBCB cases may represent contamination, antibiotic treatment of SPBCB was commonplace. Patients with clinically significant SPBCB were less likely to undergo echocardiography and had a reduced prevalence of an IE diagnosis as compared to those with MPBC. Patients with SPBCB may have a more favorable long-term prognosis as compared to that in patients with MPBC.

Disclosures. **Muhammad R. Sohail, MD**, **Medtronic** (Consultant)**Philips** (Consultant) **Larry M. Baddour, MD**, Boston Scientific (Individual(s) Involved: Self): Consultant; Botanix Pharmaceuticals (Individual(s) Involved: Self): Consultant; Roivant Sciences (Individual(s) Involved: Self): Consultant

7. Clinical outcomes and epidemiological characteristics of bacteremia in the older population of Japan

Keiji Nakamura[1]; Kayoko Hayakawa, MD, PhD[2]; Shinya Tsuzuki, MD, MSc[3]; Satoshi Ide, n/a[1]; Hidetoshi Nomoto, n/a[1]; Takato Nakamoto, n/a[1]; Gen Yamada, n/a[1]; Kei Yamamoto, n/a[1]; Norio Ohmagari, MD, MSc, PhD[2]; [1]Disease Control and Prevention Center, National Center for Global Health and Medicine, Tokyo, Japan, Fukuoka, Fukuoka, Japan; [2]National Center for Global Health and Medicine Hospital, Shinjuku, Tokyo, Japan; [3]National Center for Global Health and Medicine, Shinjuku-ku, Tokyo, Japan

Session: O-02. Blood Stream Infections and Sepsis

Background. Japan is one of the most aging societies worldwide. Because older people are highly susceptible to infectious diseases, the characteristics and clinical consequences of bacteremia in this population need clarification.

Methods. Patients aged ≥ 65 years with positive blood cultures were included in this study conducted between April 1, 2015 and March 31, 2018, and divided into three groups: pre-old (65–74 years), old (75–89 years), and super-old (≥90 years) according to the criteria of the Japanese Society of Geriatrics. They were also classified based on medical exposure: community-acquired (CA), healthcare-associated (HCA), and hospital-onset (HO). Parameters retrieved from medical records were used to compare each group using the chi-square test or Fisher's exact test; factors related to mortality were identified using multivariate logistic regression analysis after controlling for the confounding effect of baseline characteristics and underlying diseases. The Bonferroni corrected $P < 0.05$ was deemed to be statistically significant.

Results. Overall, 1716 cases of bacteremia were identified in 1415 patients. Of these, 505 cases (29.4%) were found to be due to contamination. Of the 1211 cases without contamination, 397 (32.8%) included pre-old, 658 (54.3%) included old, and 156 (12.9%) included super-old patients. HCA bacteremia increased with age, while HO bacteremia was most common in pre-old patients. *Escherichia coli* bacteremia was most common in super-old patients. While a central line-associated bloodstream infection was more common in pre-old patients, a urinary tract infection was more common in old and super-old patients. The 7-day mortality was 7.4%, 5.8%, and 14.2% in the pre-old, old, and super-old groups, respectively (P = 0.002). The 7-day mortality for CA, HCA, and HO bacteremia was 5.4%, 6.6%, and 9.5%, respectively (P > 0.05). Multivariate logistic regression showed that HO bacteremia (aOR: 1.76 [1.05–2.94], P = 0.028) and increasing age (aOR: 1.03 [1–1.06], P=0.038) are independent risk factors for 7-day mortality.

Table Comparison of characteristics of bacteremia among the pre-old, old, super-old groups, n (%)

Table. Comparison of characteristics of bacteremia among the pre-old, old, and super-old groups, n (%)				
	Pre-old	Old	Super-old	P-value*
	n = 397	n = 658	n = 156	
Male	249 (62.7)	356 (54.1)	47 (30.1)	< .001
Community acquired	147 (37)	258 (39.2)	63 (40.4)	0.696
Healthcare associated	56 (14.1)	117 (17.8)	40 (25.6)	0.006
Hospital onset	194 (48.9)	283 (43)	53 (34)	0.005
<Pathogens causing bacteremia>				
Methicillin-sensitive *S. aureus*	30 (7.6)	27 (4.1)	5 (3.2)	0.024
Escherichia coli	84 (21.2)	196 (29.8)	47 (30.1)	0.006
<Underlying diseases>				
Diabetes	91 (22.9)	159 (24.2)	21 (13.5)	0.015
Chronic heart disease	35 (8.8)	78 (11.9)	29 (18.6)	0.006
Hematological malignancy	27 (6.8)	19 (2.9)	2 (1.3)	0.001
Solid cancer	143 (36)	188 (28.6)	18 (11.5)	< .001
<Focuses of bacteremia>				
Central line-associated bloodstream infection	76 (19.1)	71 (10.8)	12 (7.7)	< .001
Urinary tract infection	65 (16.4)	184 (28)	40 (25.6)	< .001
Infective endocarditis	13 (3.3)	6 (0.9)	0 (0)	0.003
Lower respiratory tract	19 (4.8)	51 (7.8)	4 (2.6)	0.021
<Outcomes>				
ID consultation within 30 days	163 (41.1)	212 (32.2)	44 (28.2)	0.003
7-day mortality	29 (7.4)	38 (5.8)	22 (14.2)	0.002
Length of stay after bacteremia, days (IQR)	24 (14–46)	24 (14–47)	21 (13–42)	0.428
Length of stay total, days (IQR)	36 (18–70)	36.5 (17–71)	28 (15–57)	0.1

* P value is calculated for the difference among three groups.

Conclusion. The epidemiology of bacteremia differs among different older age groups; thus, these populations should not be treated as a single entity. A careful approach is needed for the optimal management of bacteremia in them.

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8. Sepsis-Associated Acute Kidney Injury and Acute Kidney Disease: A 15-Year Cohort Study of 4,226 Adult Sepsis Inpatient Survivors at a Tertiary Medical Center in Taiwan

Chih-Chia Liang, MD, PhD[1]; Hung-Chieh Yeh, MD[1]; Pei-Shan Chen, MS[1]; Chin-Chi Kuo, MD, PhD[1]; Hsiu-Yin Chiang, PhD[2]; [1]China Medical University Hospital, Taichung City, Taichung, Taiwan; [2]Big Data Center, China Medical University Hospital, Taichung City, Taichung, Taiwan

Session: O-02. Blood Stream Infections and Sepsis

Background. Sepsis is the most common cause of acute kidney injury (AKI) and about one-third of patients with sepsis-associated AKI (SA-AKI) develop acute kidney diseases (SA-AKD) and may progress to unfavorable outcomes. We aimed to study the characteristics and outcomes associated with SA-AKI and SA-AKD.

Methods. This cohort study included adult inpatients with first-time sepsis who were admitted during 2003-2017, had qualifying serum creatinine (SCr) measurements at baseline (-365 to -3 days), -2 to +7 days, and +8 to +90 days of sepsis index day, and survived the first 90 days (**Figure 1**). Sepsis was identified using an electronic medical records-based Sepsis-3 criteria. We classified sepsis inpatients into SA-AKI(-), SA-AKD(-), SA-relapsed-AKD, and SA-nonrecovery-AKD (**Figure 2**). ESRD and mortality were ascertained by linking to the Catastrophic Illness records and to National Death Registry, respectively. Multivariable Cox proportional hazard model was used to evaluate the risk of mortality and end-stage renal disease (ESRD) associated with SA-AKI/AKD subtypes.

Figure 1. Flowchart of the selection process of adult sepsis survivors (N = 4226 patients).