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#05819

Epidemiology, antimicrobial resistance, and outcomes of bloodstream infections in solid organ transplant recipients: a multi-year cohort from a high-complexity center.

10. Immune compromise & transplant ID

10b. Infections related to solid organ transplantation

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Background

Solid organ transplant (SOT) recipients are at high risk of bloodstream infections (BSIs), often caused by multidrug-resistant organisms (MDROs). Local data describing microbiology, resistance mechanisms, risk factors, and clinical outcomes are essential to guide antimicrobial stewardship and infection prevention strategies.

Methods

We conducted a retrospective cohort study including BSI episodes occurring during the first year post-transplant (2018–2019 and 2021–2024). Data were obtained from a prospectively maintained institutional database. We described epidemiology, microbiology, MDRO mechanisms, and clinical outcomes. Logistic regression identified factors associated with in-hospital mortality and MDRO-BSI.

Results

Among 221 BSI episodes in 106 SOT recipients, 61.5% were caused by MDROs (n=136). Gram-negative bacilli predominated (86.5%), mainly Klebsiella pneumoniae (33.5%) and Escherichia coli (28.6%). MDRO mechanisms included ESBL/BLEE-like (74.5%),

carbapenemases (11.8%), and non-fermenters MDR (6.4%). In-hospital mortality was 16.2%, with no significant difference between MDRO and non-MDRO BSI (14.7% vs 16.5%). In multivariable analysis, heart transplant (aOR 27.3; 95%CI 6.4–117.5) and lung transplant (aOR 11.9; 95%CI 2.0–70.5) were the strongest predictors of death. Prior MDRO colonization, prior MDRO infection, and having an MDRO as the causative pathogen showed no significant association with in-hospital mortality (crude ORs 1.65, 2.13, and 0.88, respectively). Time >180 days post-transplant was protective (aOR 0.20; 95%CI 0.07–0.56). Recent antibiotic exposure increased MDRO-BSI odds in univariate analysis but not after adjustment. MDRO BSI had a significantly higher relapse rate (41.5% vs 15.3%, p<0.001). No differences were found in severity at presentation or length of stay. Mortality attributable to infection remained low (7%).

Conclusions

BSIs in SOT recipients are predominantly due to Gram-negative organisms, with a high burden of MDROs, especially ESBL-producing Enterobacterales. Prior MDRO infection is the strongest determinant of MDRO BSI, whereas lung and heart transplantation markedly increase mortality risk. Despite similar mortality between MDRO and non-MDRO BSI, MDRO infections are associated with significantly higher relapse rates, underscoring the need for optimized empirical therapy strategies, early source control, and enhanced infection prevention practices.

Table 1. Baseline characteristics of SOT recipients with bloodstream infection (first episode per patient)

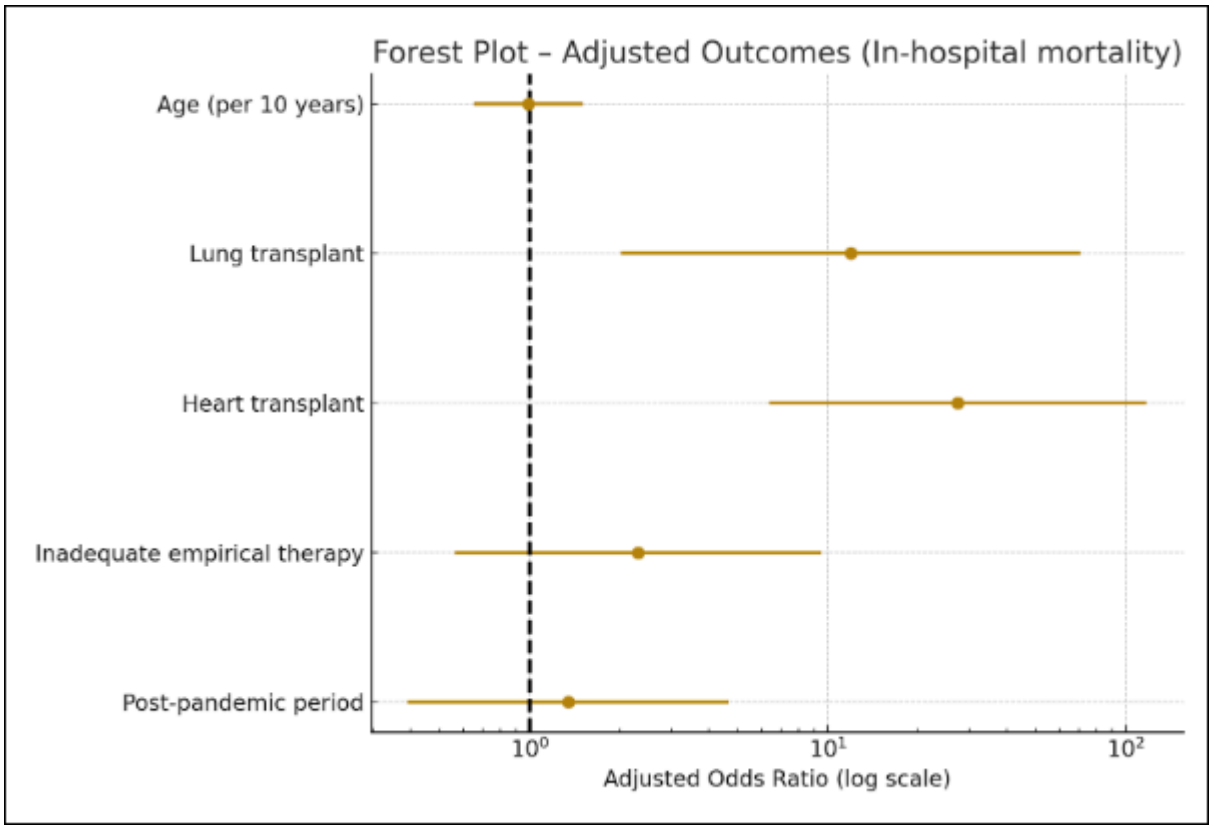
Characteristic	Total (N = 222)	Pre-pandemic (n = 121)	Post-pandemic (n = 101)	p-value
Age, years (median [IQR])	58 [42–66]	58 [42–66]	56 [45–66]	0.82
Male sex	132 (59.5%)	69 (57.1%)	63 (62.4%)	0.79
Type of transplant				0.12*
Renal	157 (73.0%)	95 (78.5%)	62 (66.0%)	
Hepatic	11 (5.1%)	3 (2.5%)	8 (8.5%)	
Cardiac	22 (10.2%)	10 (8.3%)	12 (12.8%)	
Lung	18 (8.4%)	8 (6.6%)	10 (10.6%)	
Other / Multiorgan	7 (3.3%)	5 (4.1%)	2 (2.1%)	
Cadaveric donor	203 (91.1%)	97 (88.2%)	76 (95.0%)	0.049
Re-transplantation	37 (16.7%)	11 (9.1%)	26 (26.0%)	0.003
Induction therapy: Thymoglobulin	72 (32.4%)	42 (34.7%)	30 (29.7%)	0.56
Maintenance immunosuppression (TAC + MMF + steroids)	159 (77.6%)	90 (74.4%)	69 (81.2%)	0.28
Prior MDRO colonization	74 (38.3%)	27 (23.1%)	47 (57.3%)	<0.001
Prior MDRO infection	30 (15.5%)	13 (11.0%)	17 (21.3%)	0.06
Antibiotics in the previous ≤3 months	145 (65.3%)	74 (61.2%)	71 (70.3%)	0.10
CMV reactivation within ≤30 days	23 (10.4%)	16 (13.2%)	7 (6.9%)	0.18

*Global p-value for transplant type distribution (chi-square test).

Table 2. Microorganisms isolated in BSIs and proportion of MDRO

Microorganism	Episodes n (%)	MDRO n (%)
Klebsiella pneumoniae	78 (35.1%)	63 (80.8%)
Escherichia coli	49 (22.1%)	10 (20.4%)
Enterobacter cloacae complex	33 (14.9%)	19 (57.6%)
Pseudomonas aeruginosa	27 (12.2%)	7 (25.9%)
Enterococcus spp.	14 (6.3%)	6 (42.9%)
Coagulase-negative *Staphylococci*	10 (4.5%)	3 (30.0%)
Staphylococcus aureus	3 (1.4%)	0
Acinetobacter baumannii	4 (1.8%)	4 (100%)
Serratia marcescens	2 (0.9%)	0
Klebsiella oxytoca	1 (0.5%)	1 (100%)
Stenotrophomonas maltophilia	1 (0.5%)	1 (100%)
Citrobacter freundii	1 (0.5%)	1 (100%)
Morganella morganii	1 (0.5%)	0
Candida spp.	5 (2.3%)	0
Other organisms	3 (1.4%)	0
Total	**222 (100%)**	**115 (52%)**

Figure 1. Forest Plot of Outcomes (Adjusted in-hospital mortality)



Keyword 1

Immunocompromised hosts and transplant ID

Keyword 2

Bacteria and bacterial infections

Keyword 3 (Please provide your suggestion)

bloodstream infection; multidrug resistance; carbapenemase-producing organisms; clinical outcomes.

References, 300 characters, including spaces (if exceeding 300 characters please provide DOI number only) :

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Conflicts of interest

Do any of the authors have conflicts of interest related to the studies presented in this abstract?

No