

Infective Endocarditis in *Enterococcus faecalis* Bloodstream Infections: Prevalence, Risk Factors, and Patient Outcomes

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Background

- *Enterococcus* species bloodstream infection (BSI) mortality risk: 17-34%^{1,2}
- Of all gram positive causes of infective endocarditis (IE), *E. faecalis* accounts for mostly 5-15% (up 33%) in several reviews^{3,4,5}
- IE prevalence with *E. faecalis* BSI is widely ranging between 4-26% in W. European studies (Denmark, Sweden, Spain), mainly 11-13%^{6,7,8,9,10}
- Tools for IE risk:
 - Duke's Criteria
 - NOVA Score (≥4 high risk for IE, <4 low risk for IE)
 - N: Number positive blood cultures, 5 pts
 - O: unknown Origin of bacteremia, 4 pts
 - V: prior Valvular heart disease, 2 pts
 - A: Auscultation of a heart murmur, 1 pt

Study Aims

Primary

- Prevalence of IE in *E. faecalis* BSI
- Risk factors predictive of IE
 - Comorbidities:
 - HTN, DM, COPD, ESRD, Cancer, Liver disease, CHF, Valvular heart disease, Cardiac Implantable Electronic Device (CIED), Immunosuppression, Alcoholism, Smoking, IVDU
 - Clinical variables:
 - Origin: community vs. nosocomial
 - Source: unknown vs. known
 - NOVA scores

Secondary

- Clinical outcomes:
 - 30- and 60-day mortality
 - 30- and 60-day readmissions

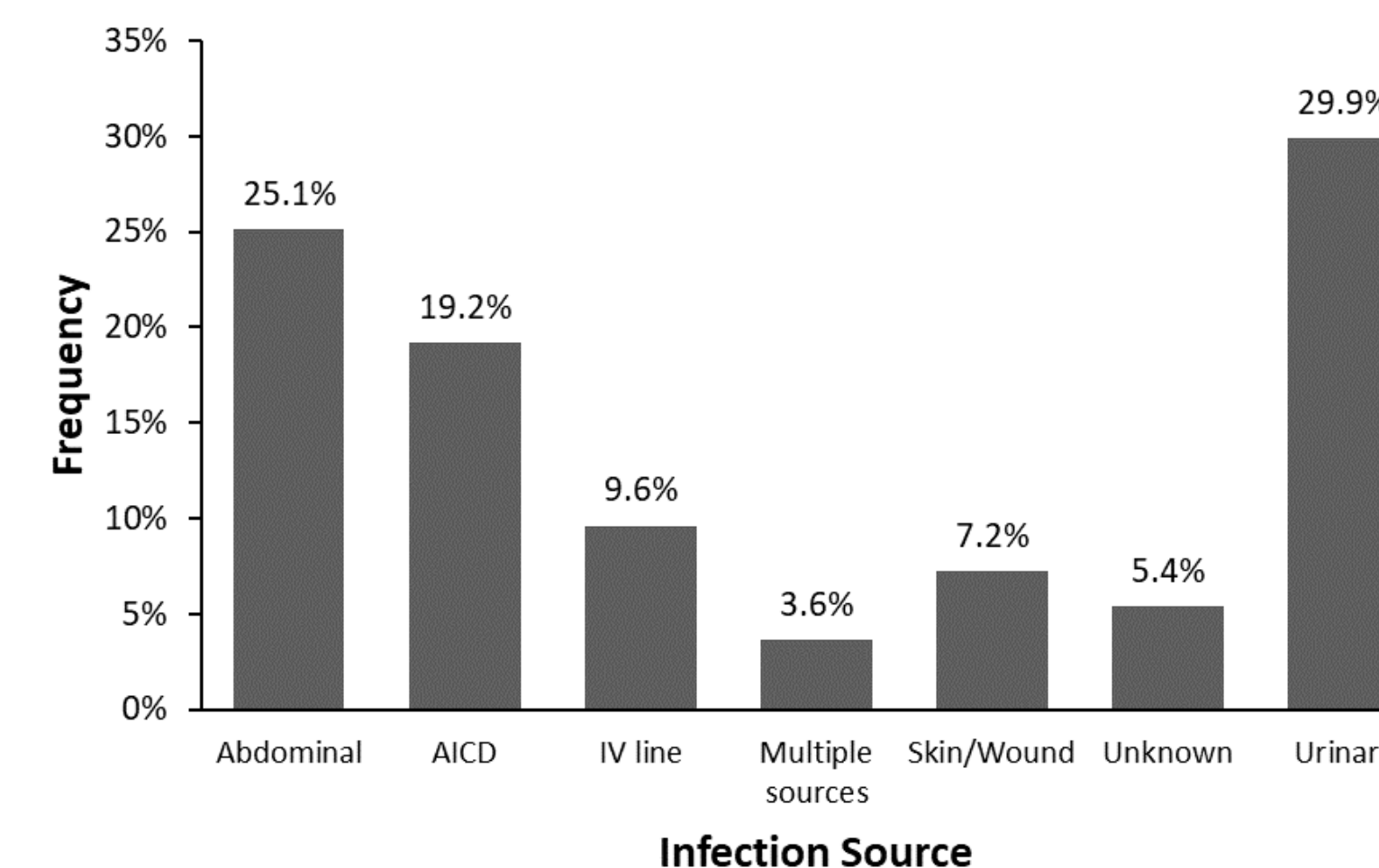
Methods

- Retrospective cohort study
- Inclusion:
 - Age ≥ 18
 - Hospitalized at St. Joseph Mercy Hospital Ann Arbor, Livingston, Chelsea, and Livonia
 - 1/1/2018 - 12/31/2020
- Exclusion:
 - Entered hospice or did not receive directed therapy within 48 hrs
- Statistical analysis:
 - Bivariate analysis (fisher's exact test, chi square), logistic regression modeling

Results

Variable	# of patients (n=167)
Age (mean, SD)	71.66 (14.81)
LOS (days, IQR)	7 [5, 11]
Gender	
Female	58 (34.73%)
Male	109 (65.27%)
IE	20 (11.98%)
DM	71 (42.51%)
COPD	43 (25.75%)
ESRD	63 (37.72%)
Liver disease	20 (11.98%)
Cancer	12 (7.19%)
CHF	51 (30.54%)
Valvular heart disease	40 (23.95%)
Alcohol abuse	2 (1.2%)
Cardiac implanted device	24 (14.37%)
Monomicrobial infection	123 (73.65%)
Polymicrobial infection	44 (26.35%)
Origin of infection	
Community acquired	156 (93.41%)
Nosocomial	11 (6.59%)
Infection source	
Known	158 (94.61%)
Unknown/other	9 (5.39%)
NOVA-1	
<4	140 (83.83%)
≥4	27 (16.17%)
NOVA-2	
<4	22 (13.17%)
≥4	145 (86.83%)

Figure 1. *E. faecalis* BSI Source of Infection



Variable	No IE	IE	p-value	
Gender	Female	53 (36.05%)	5 (25%)	0.47
	Male	94 (63.95%)	15 (75%)	
DM	63 (42.86%)	8 (40%)	0.99	
COPD	36 (24.49%)	7 (35%)	0.46	
ESRD	52 (35.37%)	11 (55%)	0.14	
Liver disease	19 (12.93%)	1 (5%)	0.47	
Cancer	11 (7.48%)	1 (5%)	>0.99	
CHF	41 (27.89%)	10 (50%)	0.08	
Valvular heart disease	30 (20.41%)	10 (50%)	0.01 *	
Alcohol abuse	2 (1.36%)	0 (0%)	>0.99	
Cardiac implanted device	17 (11.56%)	7 (35%)	0.01 *	
Polymicrobial infection	43 (29.25%)	1 (5%)	0.04 *	
Origin of infection	Community	136 (92.52%)	20 (100%)	0.36
	Nosocomial	11 (7.48%)	0 (0%)	
Source of infection	Known	140 (95.24%)	18 (90%)	0.29
	Unknown	7 (4.76%)	2 (10%)	
NOVA-1	<4	125 (85.03%)	15 (75%)	0.33
	≥4	22 (14.97%)	5 (25%)	
NOVA-2	<4	19 (12.93%)	3 (15%)	0.73
	≥4	128 (87.07%)	17 (85%)	

Table 3. Logistic Regression Modeling of IE status

Variable	OR (95% CI)	p-value
Gender: Male	1.62 (0.50, 5.26)	0.42
DM	0.71 (0.25, 2.06)	0.53
COPD	1.61 (0.52, 5.05)	0.41
ESRD	2.07 (0.70, 6.12)	0.18
CHF	1.19 (0.39, 3.69)	0.76
Valvular heart disease	2.55 (0.89, 7.34)	0.08
Cardiac implanted device	3.45 (1.06, 11.17)	0.04*
Source of infection: known	1.08 (0.14, 8.06)	0.94

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Conclusions

- IE prevalence: 12% in patients with *E. faecalis* BSI
- Greatest risk for IE with Valvular heart disease and a CIED
- Prior traditional factors not associated with increased risk IE
 - Community acquired origin
 - Unknown source of infection
 - NOVA scores
- IE status did not affect mortality, readmissions
- Mortality and readmissions are high with *E. faecalis* BSI

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- Disclosures: None