

Comparing Sentinel Admission for Infective Endocarditis Among Patients With and Without Injection Drug Use: A Single Center Study

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BACKGROUND

- Infective endocarditis (IE) is associated with high morbidity and mortality¹ with injection drug use (IDU) being a known risk factor¹⁻³
- IDU-associated IE (IDU-IE) patients have worse outcomes relative to those without IDU-associated IE^{4,5}
- Hospitalizations for IDU-IE have increased between 2000 to 2013 from 7% to 12% of all patients with endocarditis, particularly among young, white women⁶

OBJECTIVE

To describe evolving trends in demographics, clinical characteristics, rates of surgical intervention, and mortality among patients hospitalized with IE, comparing those with and without IDU-IE at a tertiary care center

METHODS

- Retrospective cohort study of patients admitted between January 1, 2007 to June 30, 2015
- Tertiary care center in Boston, MA
- Endocarditis defined by ICD-9 code and verified by modified Duke criteria
- IDU-IE = IDU as cause of IE and active IDU within 3 months of admission
- Additional data: clinical characteristics, microbiology, site of infection, complications of IE, and death

METHODS

Surgical Intervention

- Collected rates of Cardiothoracic (CT) surgery consultation and intervention within 90 days of admit
- Surgical risk by EuroSCORE II (euroscore.org/calc)

Statistics

Descriptive statistics performed using SAS v. 9.3

RESULTS

Table 1. Demographic and baseline clinical characteristics of pts with IDU-IE vs non-IDU IE

Characteristic	IDU (n=103)	Non-IDU (n=278)	p-value
Age, mean (SD)	35.4 (33.3-37.4)	61.9 (60.1-63.8)	<0.0001
Gender Female	47 (46.6%)	84 (30.2%)	0.007
Race			0.83
White	78 (75.7%)	202 (72.7%)	
Black	9 (8.7%)	31 (11.1%)	
Hispanic	6 (5.8%)	19 (6.8%)	
HIV	4 (4.8%)	7 (8.0%)	
HCV	66 (70.2%)	17 (16.0%)	
Diabetes mellitus	3 (2.9%)	47 (17%)	0.0001
Renal Function			0.0002
Normal (GFR > 85)	76 (73.8%)	145 (52.2%)	
Moderate (GFR 50-85)	12 (11.6%)	47 (16.9%)	
Severely impaired (GFR <50)	15 (14.6%)	54 (19.4%)	
Dialysis dependent	0 (0%)	32 (11.5%)	
Prior CT Surgery	9 (9.2%)	63 (22.9%)	0.003
Previous IE	22 (21.4)	18 (6.5)	<0.0001
Prosthetic Valve	9 (8.7%)	45 (16.2%)	0.06

RESULTS

Figure 1. Microbiologic Cause of IDU-IE (A) and non-IDU IE (B)

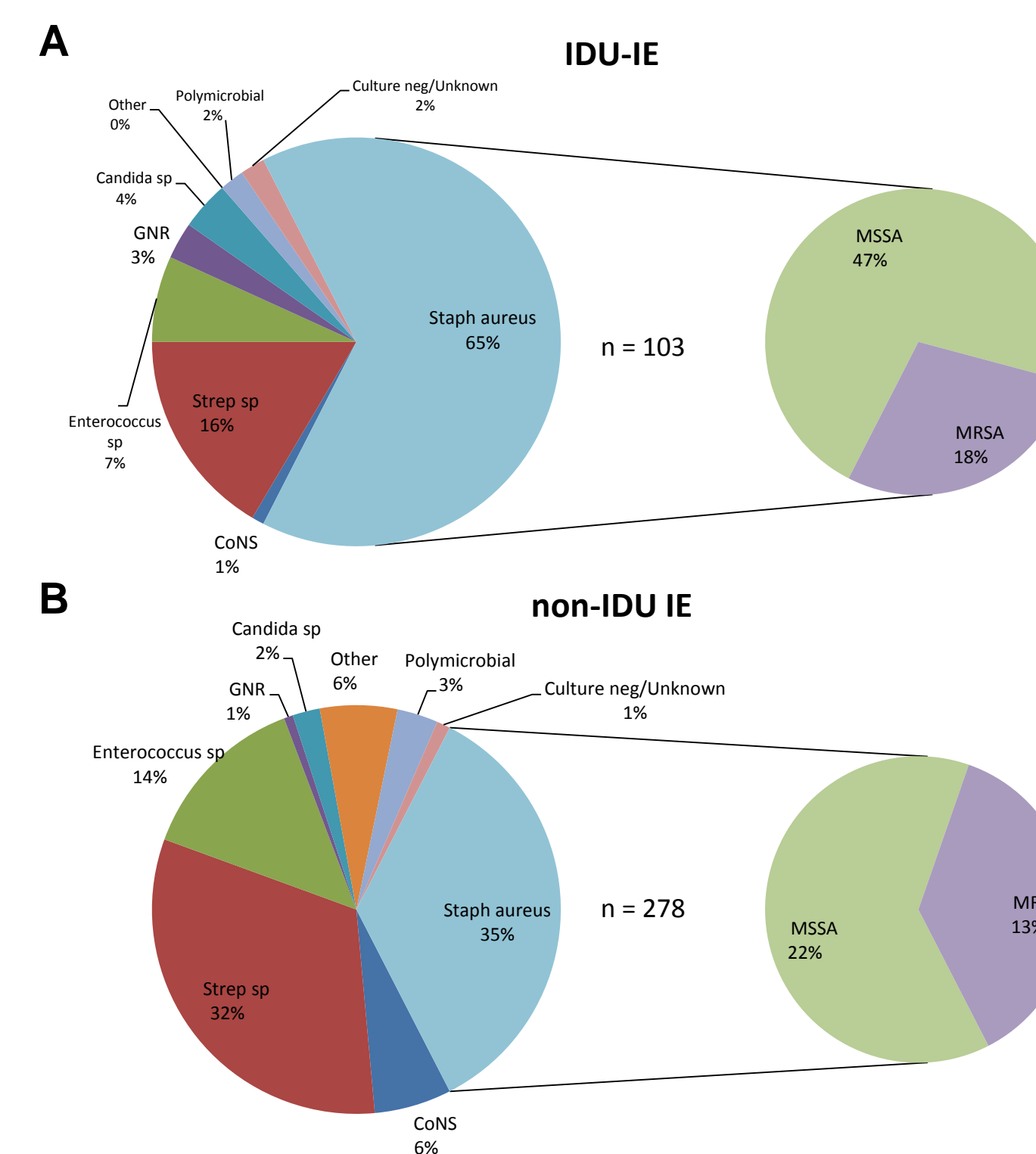


Table 2. IDU-IE vs non-IDU IE: Comparing site of infection, surgical evaluation and all-cause 1-yr mortality

Characteristic	IDU n=103 (%)	Non-IDU n=278 (%)
Site of Infection		
No vegetation seen	12 (11.6)	16 (5.8)
Left side	45 (43.7)	240 (86.3)
Right side	36 (35)	15 (5.4)
Both	10 (9.7)	7 (2.5)

RESULTS

Table 2. Continued

Characteristic	IDU n=103 (%)	Non-IDU n=278 (%)	p-value
Surgical Indications			
No surgical indication	3 (2.9)	59 (21.2)	<0.0001
Hemodynamic compromise	39 (37.9)	83 (29.8)	0.14
Perivalvular abscess	15 (14.6)	26 (9.4)	0.19
Failed antibiotics	1 (1)	5 (1.8)	1
Prosthetic valve dysfunction	2 (1.9)	11 (4)	0.52
Extracardiac emboli	85 (82.5)	135 (48.6)	<0.0001
Unresponsive organisms*	8 (7.8)	8 (2.9)	0.04
Vegetation > 1 cm	61 (59.2)	84 (30.2)	<0.0001
CT Surgery Consult			0.01
Yes	74 (71.8)	155 (55.8)	
No	29 (28.2)	119 (42.8)	
Unknown	0 (0)	4 (1.4)	
Surgery Performed	20 (38.8)	79 (28.4)	0.06
All-Cause 1-Year Mortality	16 (15.5)	37 (13.3)	0.62

* Resistant gram negative rod or *Candida* species

- IDU-IE was observed in relatively younger women with high rates of HCV infection and lower rates of diabetes, renal dysfunction, and prior CT surgery
- IDU-IE was associated with more complications and higher rates of CT surgery consultation
- Rates of surgery within 90 days and all-cause 1-year mortality were similar

CONCLUSIONS

Despite younger age, fewer medical comorbidities, and fewer prior cardiac surgeries, all-cause 1-year mortality was similar for patients after sentinel admission for IDU-IE and non-IDU IE

References

1. Murdoch DR. Clinical Presentation, Etiology, and Outcome of Infective Endocarditis in the 21st Century. *Archives of Internal Medicine*. 2009;169(5):463.
2. Wilson LE, Thomas DL, Astemborski J, Freedman TL, Vlahov D. Prospective Study of Infective Endocarditis among Injection Drug Users. *The Journal of Infectious Diseases*. 2002;185(12):1761-1766.
3. Fontana JA, Grados JD. Right-Side Endocarditis in Injection Drug Users: Review of Proposed Mechanisms of Pathogenesis. *Clinical Infectious Diseases*. 2003;36(2):374-379.
4. Rabkin DG, Makadani NA, Miller DW, Goetz RR, Venier ED, Aldrea GS. Long-Term Outcome for the Surgical Treatment of Infective Endocarditis With a Focus on Intravenous Drug Users. *The Annals of Thoracic Surgery*. 2012;93(1):51-57.
5. Shrivastava NK, Jan J, Hsu BS, et al. Injection Drug Use and Outcomes After Surgical Intervention for Infective Endocarditis. *The Annals of Thoracic Surgery*. 2015;100(3):875-882.
6. Wurcel AG, Anderson JE, Chu KH, et al. Increasing Infectious Endocarditis Among Young People Who Inject Drugs. *Open Forum Infectious Diseases*. 2016; 3(3).