

Do Patients with Drug Use-Associated Infective Endocarditis Receive Differential Care?

Ashley Cenicerros MD MPH¹, Uriel Felsen MD MS¹, Aaron Fox MD MS²

¹Department of Internal Medicine, Division of Infectious Diseases, Albert Einstein College of Medicine, Montefiore Medical Center, Bronx, NY

²Department of Internal Medicine, Division of General Internal Medicine, Albert Einstein College of Medicine, Montefiore Medical Center, Bronx, NY

BACKGROUND

An estimated 800,000 Americans use heroin/synthetic opioids; 40-70% of heroin users report injecting in the past year.^{1,2} Injection drug use is a well-known risk factor for infective endocarditis (IE), with hospitalizations notably increasing in the past decade.^{3,4} Outpatient parenteral antimicrobial therapy (OPAT) is the preferred modality for long term IV antibiotics for infections such as IE.⁵ Recent studies have reported that people with drug use-associated (DUA) infections achieve similar outcomes as those with non-DUA-infections when treated using OPAT.^{6,7}

OBJECTIVES

- To compare the use of OPAT among a cohort of patients with drug use-associated infective endocarditis vs non-drug use-associated infective endocarditis in a large urban hospital system

METHODS

STUDY DESIGN

- Retrospective cohort study

PARTICIPANTS

- All patients ≥ 18yrs old admitted to 3 adult hospitals in the Bronx, NY between 1/1/2015-9/1/2019 with an admission diagnosis of IE by ICD-9 or ICD-10 codes

DATA COLLECTION

- Extraction from electronic medical record and manual chart review

ANALYSIS

- Exposure: DUA-IE defined by admission ICD-9 or -10 codes for IE AND admission, outpatient, or ED ICD-9 or ICD-10 codes for drug use within 6 months of admission^{8,9}
- Outcome: OPAT defined as documented discharge home with plan to continue receipt of IV antibiotics
- Multivariable logistic regression, adjusting for clinically significant covariates that were decided a priori

RESULTS

Patients ≥18yo with ICD-9-CM and ICD-10-CM for infective endocarditis for 1/1/2015 to 9/1/2019 (n=1014)

Excluded (n=496):
Patients without documented treatment of IE on chart review (n=350)
Patients admitted to children's hospital (n=2)
Received CT Surgery during admission (n=144)

Patients with documented treatment or diagnosis of IE (n=518)

DUA-IE (n=126)

Non-DUA-IE (n=392)

Select Patient Characteristics

	Non-DUA-IE (392, 75.7%)	DUA-IE (126, 24.3%)	p-value
Age, ≥65 years (%)	240 (61.2)	30 (23.8)	<0.001
Sex, Male (%)	224 (57.1)	76 (60.3)	0.53
Race/Ethnicity (%)			0.03
White, Non-Hispanic	127 (32.4)	33 (20.2)	
Black, Non-Hispanic	109 (27.8)	27 (21.4)	
Hispanic	105 (26.8)	52 (41.3)	
Other	30 (7.7)	6 (4.8)	
Declined/unavailable	21 (5.4)	8 (6.4)	
Insurance (%)			0.62
Public	325 (82.9)	102 (81.0)	
Private	67 (17.1)	24 (19.1)	
Housing Status (%)			<0.001
Domiciled	377 (96.2)	107 (84.9)	
Undomiciled	1 (0.3)	12 (9.5)	
Unknown	14 (3.6)	7 (5.6)	
Median length of stay, ≥14days (%)	223 (56.9)	70 (55.6)	0.56
Median Charlson Comorbidity Index (IQR)	6 (4, 8)	5 (3, 8)	0.11
Admission to MICU (%)	63 (16.1)	24 (19.1)	0.44

PRIMARY MULTIVARIABLE REGRESSION ANALYSIS

	OPAT	No OPAT	Adjusted Odds Ratio*, 95% CI	p-value
	n=125, 24.1%	n=393, 75.9%		
DUA-IE (%)	15 (12.0%)	111 (28.2%)	0.21 (0.11, 0.41)	<0.001

SENSITIVITY ANALYSES

Removing Undomiciled Patients (n=505)

	OPAT	No OPAT	Adjusted Odds Ratio*, 95% CI	p-value
	n=125 (24.8%)	n=380 (75.3%)		
DUA-IE (%)	15 (12.0%)	99 (26.1)	0.24 (0.12, 0.46)	<0.001

Removing AMA/eloped patients (n=489)

	OPAT	No OPAT	Adjusted Odds Ratio*, 95% CI	p-value
	n=125 (21.3%)	n=364 (78.7%)		
DUA-IE (%)	15 (12.0%)	89 (24.5%)	0.29 (0.15, 0.57)	<0.001

Removing Undomiciled Patients and AMA/Eloped (n=480)

	OPAT	No OPAT	Adjusted Odds Ratio*, 95% CI	p-value
	n=125 (26.0%)	n=355 (74.0%)		
DUA-IE (%)	15 (12%)	81 (22.8%)	0.30 (0.15, 0.59)	<0.01

*Adjusted for age ≥65 years, race, insurance, year of admission, length of stay, Charlson Comorbidity Index, MICU admission

CONCLUSIONS

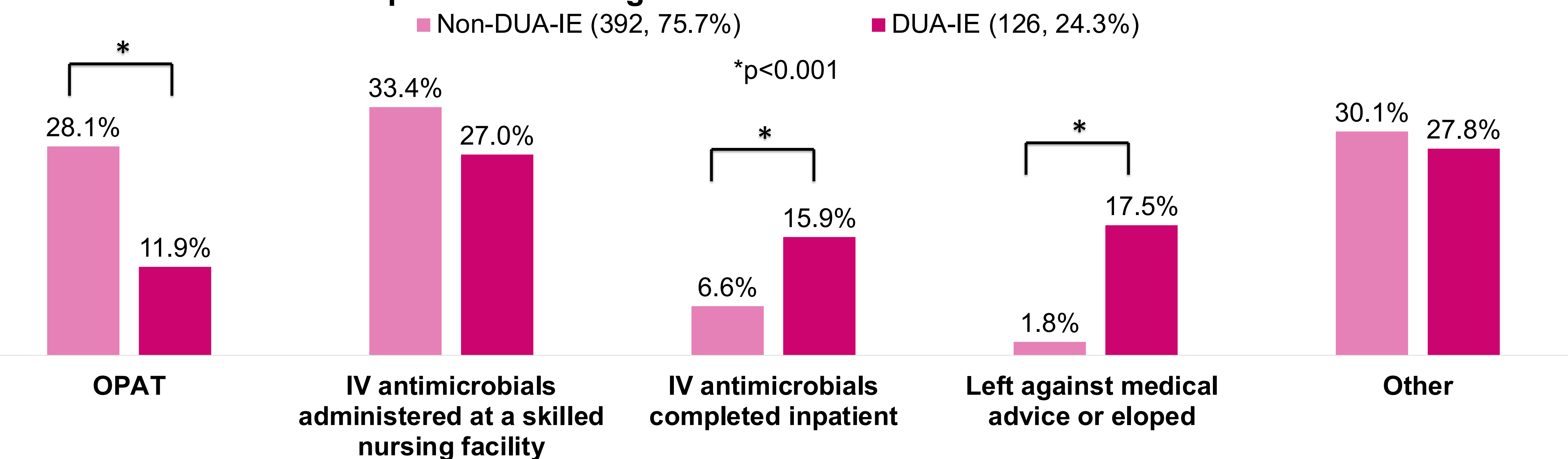
SUMMARY

Utilization of OPAT was lower among patients with DUA-IE compared to patients with non-DUA-IE admitted to an urban medical center. Unstable housing or unplanned discharges were unlikely to account for the significant difference between groups. Other research had demonstrated promising outcomes for OPAT use in DUA-IE, therefore, efforts to increase OPAT could have broad benefits for patients and the healthcare system.

NEXT STEPS

- Understanding addressable system and provider reasons for not recommending OPAT
- Understanding patient attitudes and preferences for OPAT
- Multidisciplinary program development to address barriers to care

Dispositions Among Patients with Non-DUA-IE vs. DUA-IE



1) Behrends, C. N., et al. *J Subst Abuse Treat*. 2019, 106, 79-88.
 2) Midgette G, D. S., et al. RAND Corporation. 2019.
 3) Mori, M., et al. *J Am Heart Assoc*, 2019, 9(6): e012465.
 4) Schranz, A. J., et al. *Ann Intern Med*. 2018.
 5) Norris, A. H., et al. *Clin Infect Dis*, 2019, 68(1): e1-e35.
 6) O'Callaghan, K., et al. *Eur J Clin Microbiol Infect Dis*, 2019, 38(3): 575-580.
 7) Price, C. N., et al. *J Infect Dis*, 2020, 222(Supplement_5): S494-S498.
 8) Ball, L. J., et al. *Med Care*, 2018, 56(10): e70-e75.
 9) Kobayashi, T., et al. *Open Forum Infect Dis*, 2020, 7(6): ofaa201.