



Multidisciplinary Drug Use Endocarditis Treatment (DUET) Team: Results From an Academic Center Cohort

Darshali A. Vyas MD^{1,5,6}, Lucas Marinacci MD^{1,5,6}, Thoralf Sundt MD^{2,5,6}, Arminder Jassar MD^{2,5,6}, Benjamin Bearnot MD MPH^{1,5,6}, Virginia A. Triant MD MPH^{3,5,6}, Sandra Nelson MD^{3,5,6}, Sarah Wakeman MD^{1,5,6}, David M. Dudzinski MD^{4,5,6}, Molly L. Paras MD^{3,5,6}

¹Department of Medicine; ²Division of Cardiac Surgery; ³Division of Infectious Diseases; ⁴Division of Cardiology; ⁵Massachusetts General Hospital; ⁶Harvard Medical School, Boston, MA

Contact Information
Darshali A Vyas, MD
55 Fruit St
Boston, MA 02114
davyas@partners.org
617-643-5299

Introduction

Guidelines recommend multidisciplinary models for the management of infective endocarditis but have failed to incorporate the unique challenges of treating drug-use associated infective endocarditis (DUA-IE).

Given the drug use and overdose epidemic with rising cases of DUA-IE, we created a multidisciplinary Drug Use Endocarditis Treatment (DUET) Team, which convenes monthly and *ad hoc* case conferences with core members including Addiction Medicine, Cardiac Surgery, Cardiology and Infectious Diseases clinicians.

Objectives

To conduct a retrospective cohort study of the patients presented at the DUET conferences from August 2018 to May 2020 to

- (1) assess clinical and demographic characteristics
- (2) describe clinical outcomes.

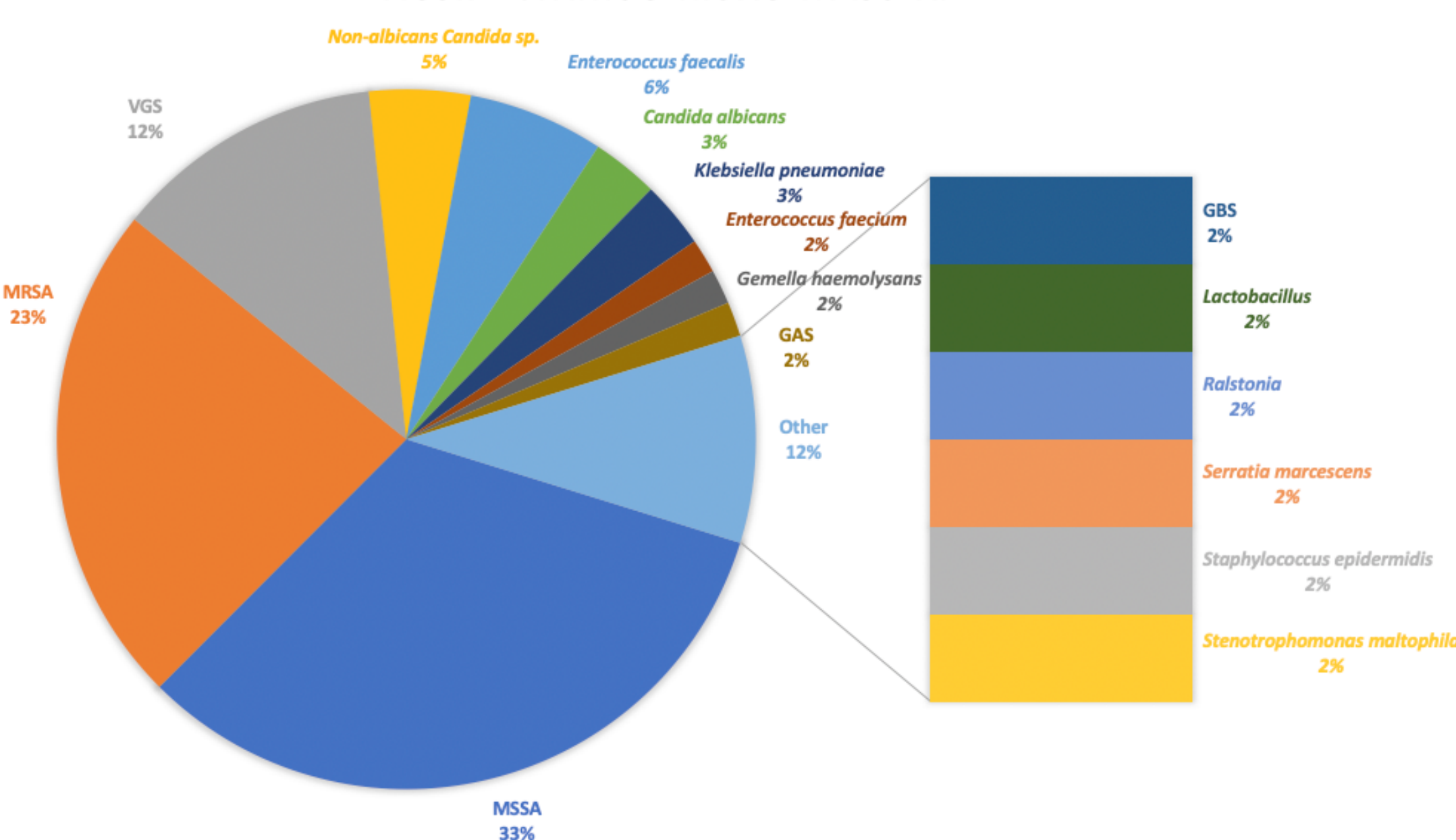
Methods

A retrospective chart review was conducted to analyze 60 patient cases, including descriptive statistical analyses of demographics, clinical characteristics, and outcomes.

IRB approval was obtained (MGH 2019P003774).

Results

FIGURE 1: PATHOGENIC AGENT ISOLATED



GAS= Group A *Streptococci*. GBS= Group B *Streptococci*. MRSA=Methicillin resistant *Staphylococcus aureus*. MSSA=Methicillin susceptible *Staphylococcus aureus*. VGS= Viridans group *Streptococci*.

Results

Table 1: Patient Characteristics

	N (60)	Percentage %
Mean Age (y ± SD)	38 ± 9	
Male Gender	31	51.7
Unstable Housing	20	33.3
Insurance Type		
Medicaid	41	68.3
Medicare	6	10
Commercial	12	20
Uninsured	1	1.7
Route of Admission		
Direct admit or ED	35	58.3
Outside hospital transfer	25	41.7
Self-Reported Injection Drug Use		
Injection heroin	46	76.7
Injection fentanyl	21	35
Injection cocaine	31	51.7
Injection methamphetamine	9	15
Prior episode(s) of endocarditis	33	55

Table 2: Infection Characteristics

	N (total=60)	Percentage (%)
Duke Criteria		
Definite	54	90
Probable	6	10
Valve Affected		
Tricuspid	35	58.3
Mitral	16	26.7
Aortic	15	25
Type of Valve		
Native	51	85
Prosthetic	9	15
Infection Characteristics		
Monomicrobial Infection	47	78.3
Polymicrobial Infection	9	15
Culture Negative	4	6.7
Sites of Metastatic Infection		
Lung	38	63.3
Joint	21	35
Central nervous system	17	28.3
Spleen	14	23.3
Kidney	8	13.3
Spine	7	11.7
Coronary arteries	4	6.7
Eyes	3	5
Muscle	3	5
Skin	3	5
Liver	2	3.3
Pericardium	1	1.7

Table 3: Outcome Measures

	N (60)	Percentage %	Days
Median length of hospital stay			14
Median days until blood cultures cleared			2
Consultations and Management			
Infectious Diseases consult	57	95	
Addiction Medicine consult	51	85	
Cardiology consult	25	41.7	
Cardiac Surgery consult	36	60	
Antimicrobial treatment alone	46	76.7	
Surgery during admission	14	23.3	
Planned Course of Antibiotic Treatment	n=48		
8 weeks	4		
6 weeks	38		
4 weeks	3		
2 weeks	3		
Mean days remaining in antimicrobial course on day of discharge			24.6
Long Term Access	n=43		
Peripherally Inserted Central Catheter (PICC)	41		
Peripheral IV (PIV)	2		
Type of Surgery			
Mitral valve repair	2		
Mitral valve replacement	3		
Aortic valve replacement	8		
Tricuspid valve replacement	4		
Endovascular right atrial thrombus removal	1		
Indication for Surgery (total n=14)			
Systemic Emboli	6		
Heart Failure Class NYHA III-IV	5		
Paravalvular Abscess	5		
Vegetation > 1cm	5		
Difficult to Eradicate Organism	4		
Prosthetic Valve Dysfunction	2		
Hemodynamic Compromise	2		
Completed Planned Antibiotic Course			
Yes (non-operative / operative)	17/9 (p=0.08)		
No/Uncertain (Non-operative / operative)	29/5		
Discharged on HIV PrEP	1	1.7	
SUD Management			
Discharged with naloxone	21	35	
Newly initiated on MOUD treatment	29	48.3	
Started on Buprenorphine + naloxone	8		
Started on methadone	21		
Discharge Location			
SNF/Rehab	31	51.7	
Unplanned/Patient directed discharge	10	16.7	
Transferred back to referring hospital	8	13.3	
Home to stable housing	6	10	
Died during admission	5	8.3	

Outcomes at 90 days post-discharge (n=46)		
Readmission to hospital	25	54.3
Recurrence of endocarditis	7	15.2
Bacteremia (excluding endocarditis recurrence)	4	8.7
Congestive heart failure	4	8.7
Skin and soft tissue infection	3	6.5
Death	2	4.3
Hemorrhagic stroke	1	2.2
Overdose	1	2.2
Renal failure	1	2.2
Loss to Follow Up	14	23.3

ED= Emergency Department. MOUD=Medications for Opioid Use Disorder. MRSA=Methicillin resistant *Staphylococcus aureus*. MSSA=Methicillin susceptible *Staphylococcus aureus*. PrEP= Pre-Exposure Prophylaxis. SNF=Skilled Nursing Facility. SD= Standard Deviation.

- Among the DUET cohort, 85% involved native valve endocarditis with 58% right sided involvement and 13.3% with mixed right and left-sided involvement
- MSSA was the most common pathogen isolated, followed by MRSA and then viridans group Streptococci
- 23% of patients were managed operatively
- The rate of antibiotic completion was higher among patients managed operatively, but did not reach statistical significance (p=0.08)
- Formal Addiction Medicine consults were obtained in 85% of cases, with 29% newly initiated on MOUD during the hospitalization
- 35% of patients were discharged with naloxone, and only 1 patient was initiated on PrEP
- 51.7% were discharged to SNF/Rehab after hospitalization
- 54.3% of patients were readmitted to the hospital and 15.2% experienced a recurrence of endocarditis within 90 days of discharge
- 7 of 60 (11.7%) of patients died including 5 patients while hospitalized and 2 after discharge

Conclusions

Multidisciplinary care teams such as the MGH DUET model provide a promising framework for DUA-IE to enhance and integrate nuanced decision-making. This patient population merits input from numerous sub-specialties, and further efforts are required to ensure continued integration of treatment and harm reduction strategies.