

BACKGROUND

- Studies of chronic inotropic support in end-stage heart failure (HF) have previously reported poor survival, but contemporary data are limited.
- There is insufficient data describing the effect of long-term inotropes on hemodynamic parameters and renal function.

RESEARCH AIMS

This study aims to examine the rate of successful orthotopic heart transplant (OHT) in patients on long-term inotrope therapy and listed for OHT at UNOS status 1A or 1B. In addition, we describe the effect of long-term inotrope treatment on patient hemodynamics and renal function.

METHODS

- Adults listed for OHT at status 1A or 1B and treated with inotrope for >30 days at the University of Rochester from 2001 to 2017 were identified from the UNOS database.
- Followed until “success” (recovery of cardiac function or OHT without preoperative mechanical support) or “failure” (death, downgrade of listing status due to instability, LVAD or IABP implantation).
- Invasive hemodynamics and creatinine after inotrope initiation (baseline) and immediately prior to outcome were obtained from UNOS and medical record
- Medications were recorded at 30 days after the initiation of inotrope
- Primary outcome: successful bridge to transplant
- Secondary outcomes: change in invasive hemodynamic parameters and change in creatinine

RESULTS: Patient Characteristics

- One hundred forty-nine patients were supported by inotrope for 156 ± 125 days (mean)
- One hundred eighteen patients (79.2 %) achieved success (10 recovered, 106 OHT at our center, 2 OHT at another center), and 31 (20.8%) failed (2 died, 4 clinically deteriorated, 8 LVAD, 17 IABP)

Table 1. Characteristics and Outcomes of Success and Failure Groups

Variable	Success (n = 118)	Failure (n = 31)	p Value
Age, mean ± SD	55.4 ± 11.2	53.5 ± 12.4	0.406
Male Gender, n (%)	88 (74.6)	29 (93.5)	0.022
Days on Inotropes, mean ± SD	161.5 ± 123.5	138.8 ± 131.9	0.293
Inotrope Type, n (%)			
Milrinone	111 (94.1)	31 (100)	0.933
Milrinone dose (mcg/kg/min), mean ± SD	0.43 ± 0.10	0.43 ± 0.12	0.933
Blood Type O, n (%)	41 (34.7)	12 (38.7)	0.682
Ischemic Cardiomyopathy, n (%)	52 (44.1)	10 (32.3)	0.235
Implantable Cardioverter-Defibrillator, n (%)	102 (86.4)	25 (80.7)	0.570
Medications Post-Inotrope, n (%)			
Beta-Blocker	101 (96.2)	27 (87.1)	0.079
Angiotensin converting enzyme inhibitor or angiotensin II receptor blocker	75 (71.4)	13 (41.9)	0.003
Aldosterone Antagonist	72 (67.9)	23 (74.2)	0.505
Antiarrhythmic	40 (38.1)	4 (12.9)	0.008
Measurements After Inotrope Initiation (Baseline), mean ± SD			
Mean Pulmonary Artery Pressure (mmHg)	30.6 ± 8.7	32.4 ± 8.2	0.290
Pulmonary Vascular Resistance (Wood units)	2.4 ± 1.3	2.7 ± 1.2	0.210
Serum creatinine (mg/dL)	1.17 ± 0.32	1.17 ± 0.29	0.943
Measurements Before Outcome, mean ± SD			
Mean Pulmonary Artery Pressure (mmHg)	29.0 ± 8.7	37.4 ± 10.9	<0.001
Pulmonary Vascular Resistance (Wood units)	2.2 ± 1.3	3.0 ± 1.9	0.072
Serum creatinine (mg/dL)	1.26 ± 0.33	1.67 ± 0.64	0.002

Disclosures: none

RESULTS: Patient Outcomes

Figure 1: Patient Outcomes

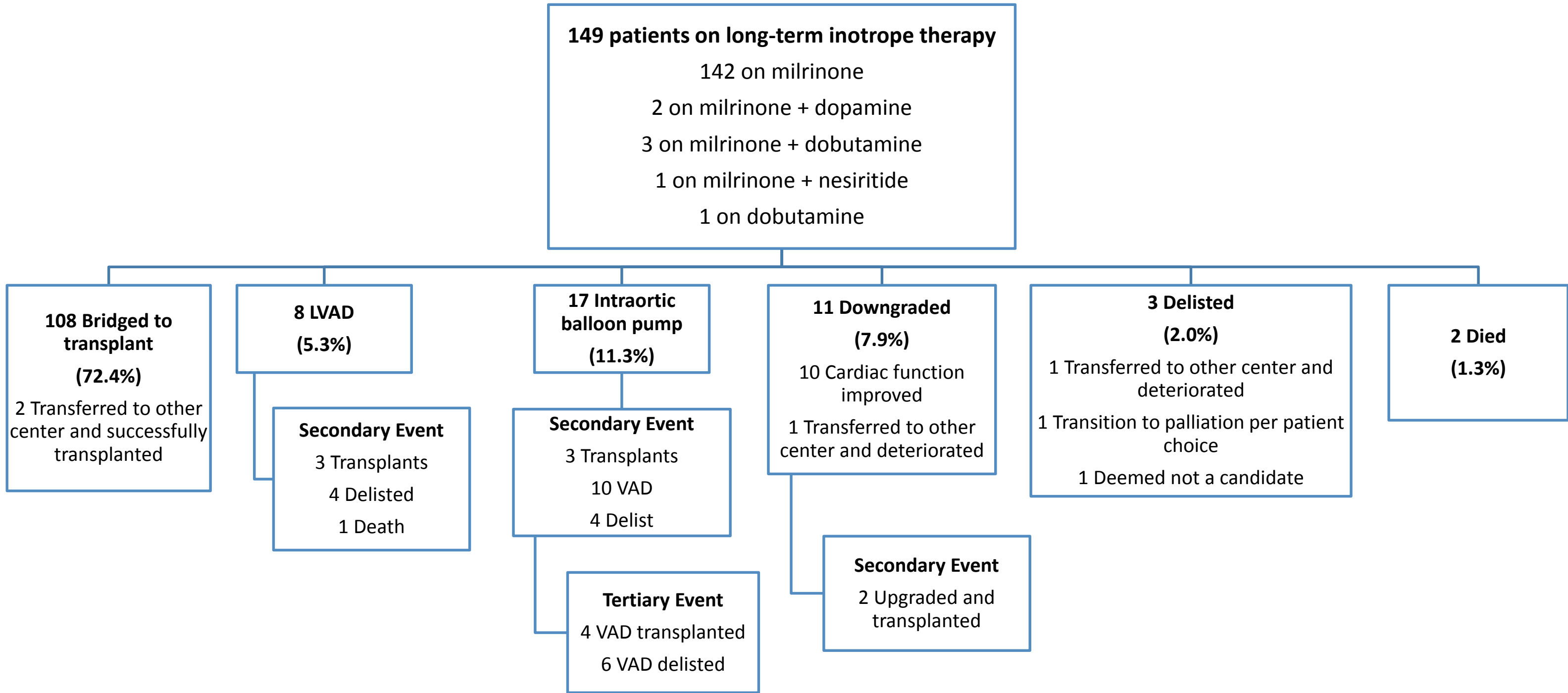
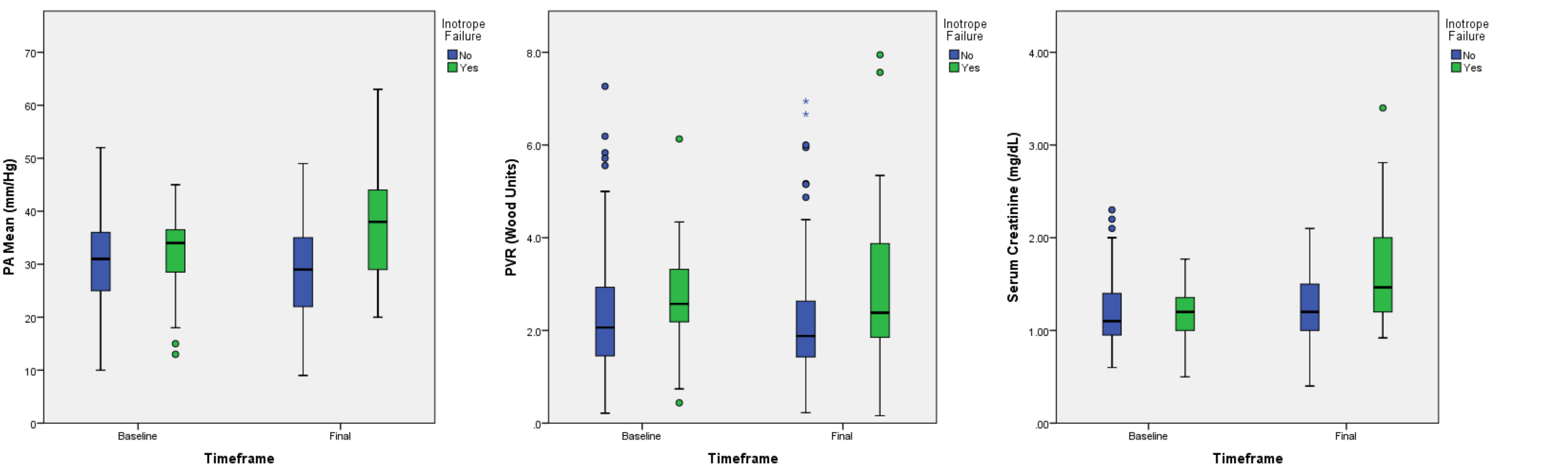


Table 2: Change in hemodynamic parameters of the success group compared with the failure group

	Total	Inotrope Success	Inotrope Failure	ANOVA Results	
	Mean Difference (End - Start)	Mean Difference (End - Start)	Mean Difference (End - Start)	Start vs End p value	Success vs Failure p value
PA Systolic (mm/Hg)	-2.36 ± 14.26	-4.14 ± 13.69	4.50 ± 14.5	0.899	0.003
PA Diastolic (mm/Hg)	-0.014 ± 9.33	-1.28 ± 8.39	4.87 ± 11.18	0.054	0.001
PA Mean (mm/Hg)	-0.26 ± 9.98	-1.61 ± 8.99	4.90 ± 11.9	0.099	0.001
Cardiac Output (L/min)	0.19 ± 1.43	0.19 ± 1.45	0.16 ± 1.36	0.243	0.906
PCW Mean (mm/Hg)	-0.003 ± 8.65	-0.76 ± 8.05	3.16 ± 10.43	0.209	0.042
PVR (wood units)	-0.03 ± 1.61	-0.10 ± 1.44	0.28 ± 2.19	0.635	0.303
Serum Creatinine (mg/dL)	0.17 ± 0.38	0.08 ± 0.27	0.50 ± 0.57	< 0.001	< 0.001

Figure 2: Pulmonary artery mean pressure, pulmonary vascular resistance, and serum creatinine from baseline compared to final outcome event in the success and failure groups



CONCLUSIONS

- Most OHT candidates were successfully bridged to OHT and did not exhibit significant change in invasive hemodynamic measurements over time
- In success patients, mean pulmonary artery pressure and pulmonary vascular resistance did not change significantly during inotrope support, even among those on inotrope for longer than the mean duration.
- Success patients were more likely to be treated with angiotensin converting enzyme inhibitor or angiotensin II receptor blocker and antiarrhythmic while on inotrope therapy.
- Failure patients had significant increase in mean pulmonary artery pressure and pulmonary capillary wedge pressure over time when compared to success patients.
- Close attention must be paid to the hemodynamic parameters of patients treated with long-term inotrope therapy.