Vasopressor Discontinuation Order in Septic Shock with Reduced LV Function

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Disclosures

These individuals have the following to disclose concerning possible financial or personal relationships with commercial entities (or their competitors) that may be referenced in this presentation:

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LV Dysfunction in Sepsis

Heart failure and sepsis are common and often intertwined disease states associated with increased mortality

Altered Hemodynamics

	Cardiac Output	Heart Rate	Preload	SVR
LV Dysfunction	↓	↑	↑	↑
Sepsis	↑	↑	↓	↓

The Surviving Sepsis Campaign does not provide recommendations concerning which vasopressor to taper first in septic shock

Current evidence is conflicting regarding the order of vasopressor discontinuation in patients with septic shock

Patients with LV dysfunction may have varying responses to vasopressors and their discontinuation

LV: Left Ventricle | SVR: Systemic Vascular Resistance

N Engl J Med 2014; 369.18 (2013): 1726-1734. *JAMA* 2016;315(8):801-210. *Intensive Care Med*. 2017;43(3):304-377. *Ann Pharmacother*. 2018;52(8):733-739. *J Intensive Care Med*. 2017:885066617714209. *Crit Care*. 2018;22(1):131.

Current Literature

Outcomes	Sacha et al. 2018	Musallam et al. 2018	Hammond et al. 2019	Bissell et al. 2019
Patients, n	585	80	154	61
Results – Primary Outcome	55% in VP DC first group vs. 50% in NE DC first group (p = 0.28)	62% in VP DC first group vs. 28% in NE DC first group (p = 0.004)	68% in VP DC first group vs. 11% NE DC first group (p < 0.001)	74% in VP DC first group vs. 17% in NE DC first group (p < 0.01)
Lower Incidence of Primary Outcome*	No difference between groups	Norepinephrine DC First	Norepinephrine DC First	Norepinephrine DC First
Number Needed to Treat, n	20.4	3	1.7	1.7
Patients with LV Dysfunction	16% VP DC First vs. 16% NE DC First	22% VP DC First vs. 31% NE DC First	21% VP DC First vs. 15% NE DC First	Not Reported

NE = Norepinephrine | VP = Vasopressin | DC = Discontinued
*Primary Outcome: Clinically significant hypotension as defined per authors

Intensive Care Med. 2019;34(10):805-810. *Ann Pharmacother*. 2018;52(8):733-739. *Pharmacotherapy*. 2018:38(3):319-326. *Intensive Care Med*. 2019;34(9):761-765.

Methods

The purpose of this study is to characterize the incidence of clinically significant hypotension following the discontinuation of vasopressin or norepinephrine in patients with septic shock and LV dysfunction

Inclusion

- Adults ≥ 18 years admitted to the AU Medical Center pulmonary critical care service (i.e. MICU)
- LV dysfunction (EF < 40%)
- Met the Sepsis-3 definition of septic shock
- Received continuous infusions of norepinephrine and vasopressin as the last vasopressors to be discontinued

Exclusion

- Patients who transitioned to palliative care while receiving vasopressor therapy
- If norepinephrine and vasopressin were discontinued simultaneously
- Expired within 48 hours of ICU admission
- Pregnant

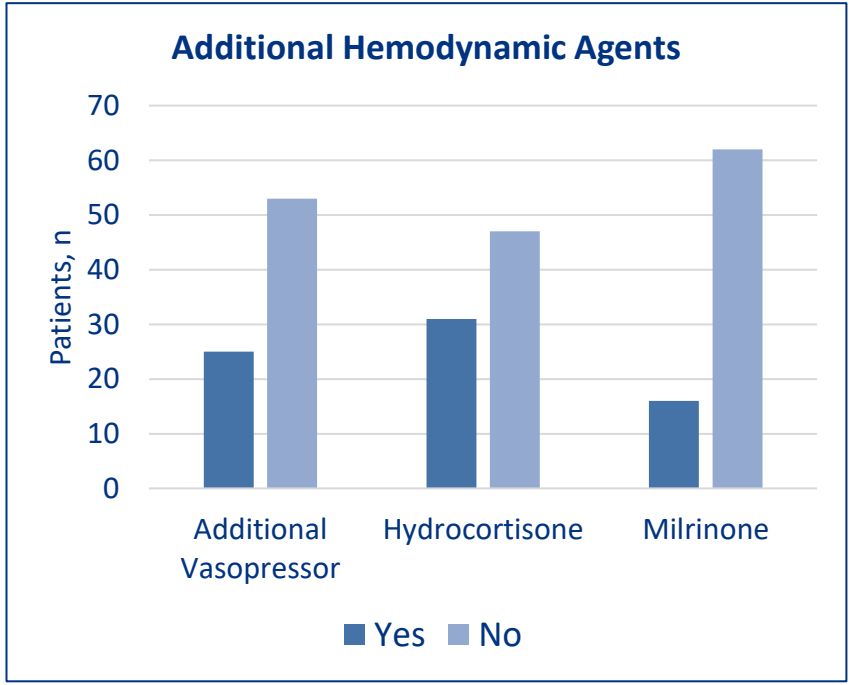
IRB approved, single center, retrospective chart review from January 1, 2015 to June 30, 2019

Based on previous studies, we determined we would need 31 patients per group to see a 40% difference in clinically significant hypotension

LV: Left Ventricle | MICU: Medical Intensive Care Unit
EF: Ejection Fraction | IRB: Investigational Review Board

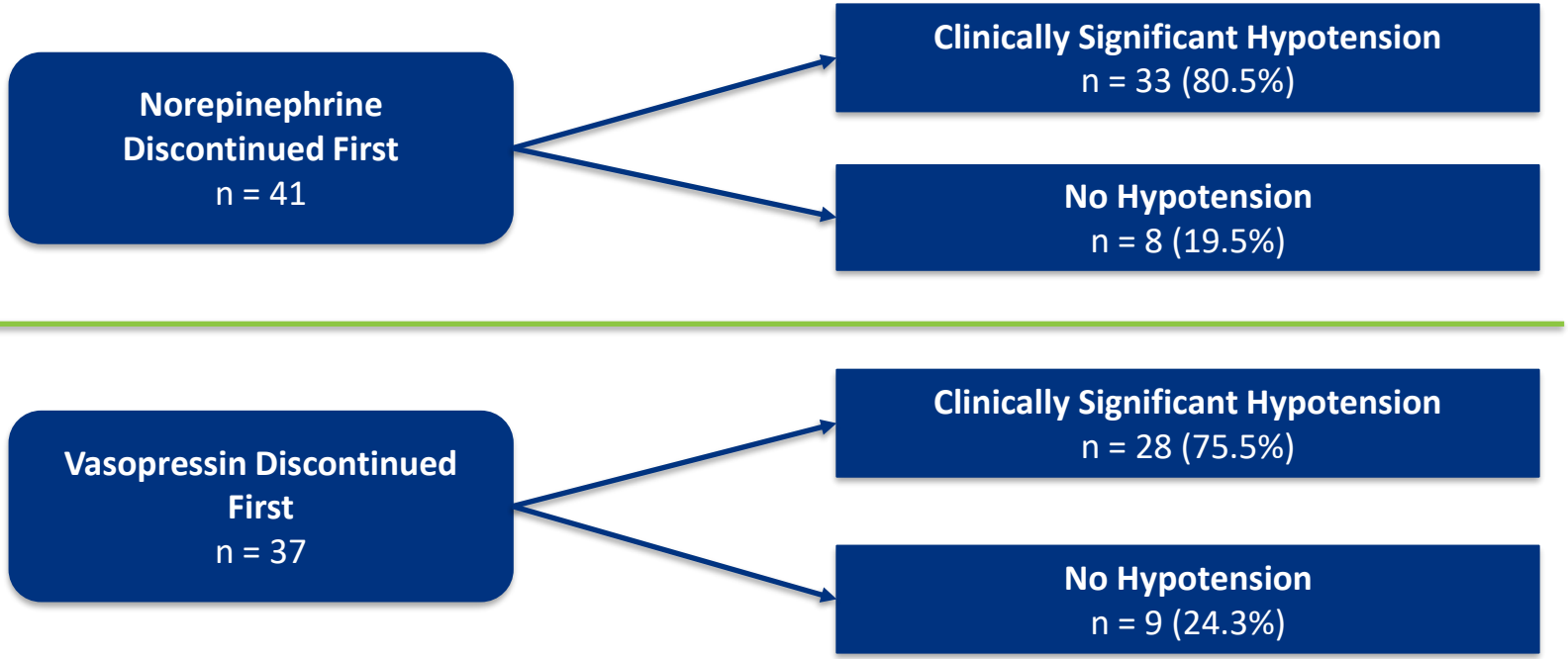
Demographics

Characteristic	Study Population (n = 78)
Male, n (%)	50 (64.1)
Age in years, mean ± SD	61 ± 13.7
Weight in kilograms, mean ± SD	85.4 ± 25.1
Body Mass Index, mean ± SD	28.7 ± 7.6
SOFA Score, mean ± SD	9.6 ± 2.5
History of LV dysfunction, n (%)	25 (32.1)
Ejection Fraction in %, mean ± SD	28 ± 9.3



LV: Left Ventricle | SD: Standard Deviation

Primary Outcome



P value = 0.61

Secondary Outcomes

Outcome	Norepinephrine Discontinued First (n = 41)	Vasopressin Discontinued First (n = 37)	p value
ICU Mortality, n (%)	15 (36.6)	10 (27.1)	0.82
Hospital Mortality, n (%)	15 (36.6)	11 (29.7)	0.41
ICU Length of Stay – days, mean ± SD	17 ± 12.55	10.5 ± 9.5	0.0121
Hospital Length of Stay – days, mean ± SD	28.5 ± 21.7	15.3 ± 17.9	0.047
Cumulative Dose of Norepinephrine – mg, mean ± SD	83.8 ± 140.7	151.6 ± 197.1	0.083
Cumulative Dose of Vasopressin – units, mean ± SD	141.3 ± 118.7	81.6 ± 141.9	0.039
Duration of Norepinephrine – hours, mean ± SD	57.8 ± 45.8	67.5 ± 58.8	0.038
Duration of Vasopressin – hours, mean ± SD	82.8 ± 50.2	34.3 ± 46.8	0.0042

SD: Standard Deviation

Conclusions

- In contrast to what has been shown in previous studies, the incidence of clinically significant hypotension was similar following discontinuation of vasopressin and norepinephrine
- The incidence of ICU and hospital mortality was similar among both groups
- ICU and hospital lengths of stay were found to be significantly reduced in the group where vasopressin was discontinued first, although this study was not powered for this outcome

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