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Impact of obesity on hemodynamic interventions in patients with septic shock receiving weight-based norepinephrine

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BACKGROUND

- Norepinephrine is currently the first choice vasopressor in sepsis after fluid resuscitation has been attempted
- Norepinephrine is beneficial in restoring organ perfusion and increasing blood pressure due to its vasoconstrictive effects
- VASST trial showed no outcome differences in using norepinephrine alone or in combination with vasopressin
- Despite norepinephrine's long history of use, a standardized dosing strategy has not been established
- Strategies traditionally use either a weight-based dosing (WBD, mcg/kg/min) or non-WBD (mcg/min) strategy with infusion maximums widely varying among institutions from 30-300 mcg/min
- The impact of this dosing strategy on patient outcomes and adverse effects is unknown but could be impacted by body weight
- From 1988 to 2016, the adult obesity rate has increased by an estimated 16.7%
- Obesity is defined as a BMI ≥ 30

STUDY QUESTION

Do norepinephrine requirements and second-line hemodynamic interventions differ in obese versus non-obese patients receiving WBD norepinephrine for management of septic shock?

STUDY OUTCOMES

Primary Outcomes

- Cumulative dose of norepinephrine (mg)

Secondary Outcomes

- Receipt of and time to second-line hemodynamic interventions and patient outcomes

HYPOTHESIS

It is expected that the use of WBD will result in greater cumulative doses of norepinephrine and earlier initiation of second-line interventions in obese patients

INCLUSION AND EXCLUSION CRITERIA

Inclusion

- Critically ill patients with septic shock
- Any BMI
- Received a continuous norepinephrine infusion for at least one hour

Exclusion

- Age < 18 years old
- Second lifetime shock event in the same patient
- Other vasopressor received prior to NE
- NE ordered but not given
- NE infusion of <1 hour

TABLE 1. VARIABLES COLLECTED

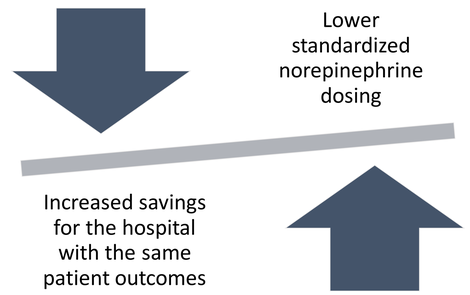
Baseline Characteristics	Fluid Data	Outcomes	Norepinephrine (NE) Related Vitals
Age (years)	Input Day 1	Cumulative NE dose (mg)	MAP at NE initiation
Weight (kg)	Output Day 1	Initial NE infusion rate (mcg/min)	Goal MAP
BMI	Net Day 1	Max NE infusion rate (mcg/min)	Time to goal MAP
Gender	Input Day 2	Total NE infusion duration (minutes)	
Co-morbidities	Output Day 2	Average NE infusion rate	
CAD	Net Day 2	Secondary vasopressor initiated?	
CHF	Input Day 3	NE infusion rate at the time of second vasopressor initiation (mcg/min)	
COPD	Output Day 3	Cumulative secondary vasopressor dose in NE equivalents	
Hepatic dysfunction (hepatitis, cirrhosis)	Net Day 3	Tertiary vasopressor initiated?	
Renal dysfunction (insufficiency, CKD, ESRD)		NE infusion rate at the time of third vasopressor initiation (mcg/min)	
CRRT		Cumulative tertiary vasopressor dose in NE equivalents	
Baseline organ dysfunction		Corticosteroid administered	
SOFA Score		Cumulative steroid dose (mg)	
Mortality			

METHODS

- Design: IRB-approved, multi-center, retrospective cohort.
- A list of patients, who had norepinephrine infusions, was pulled from Augusta University and were then selected to be used for data collection based on inclusion and exclusion criteria
- Descriptive statistics will be used
  - Categorical and continuous variables will be compared with the chi-squared and Mann-Whitney U tests, respectively
  - A linear regression model controlling for severity of illness, site of infection, and patient demographics will be applied to the primary outcome

IMPLICATIONS

- If there are no statistically significant differences in second-line hemodynamic interventions, then it would demonstrate that there is no benefit to WBD and a standardized dose may need to be used
- A standardized norepinephrine dose may reduce the need of secondary hemodynamic interventions



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