1

- PollEv.com/mehrnazsadr080
- Text MEHRNAZSADR080 to 22333 once to join then A,B,C, or D

2

Mehrnaz Sadrolashrafi, PharmD
PGY2 Critical Care Pharmacy Resident
Baystate Medical Center
Springfield, MA

3 **Disclosure**

- I Love Septic Shock
- I have no disclosures concerning relationships with commercial entities that may have a direct/indirect interest in the subject matter of this presentation.
-

4 **Objectives**

1. Summarize pathophysiology and role of vasopressor therapy in septic shock
2. Evaluate current literature to determine efficacy and safety of angiotensin II for vasodilatory shock
3. Review Baystate Medical Center's practice guideline on initiation of angiotensin II for vasodilatory shock

-

5 **Septic Shock is Distributive**

6 **Distributive Shock**

- Distributive Shock:
  - Septic
  - Neurogenic
  - Anaphylactic
  - Adrenal Crisis
- No Change in Blood volume
- Decreased Vascular tone (vasodilation) causes change in the distribution of fluid and intravascular volume
- Increased capillary permeability leading to loss of intravascular volume and fluid loss leading to less blood to major organs in body
-

7

8 **Vasopressors**

9 **Norepinephrine/Epinephrine**

10 **Norepinephrine/Epinephrine**

11 **Vasopressin**

12 **Angiotensin II for the Treatment of High-Output Shock (ATHOS-3)**

13 **Angiotensin II**

14 **ATHOS-3**

15 **ATHOS-3**

16 **ATHOS-3**

17 **Distribution of Vasopressor Dose Upon Randomization**

18 **MAP Over Time**

19 **MAP Over Time**

20 **Change in Dose of Vasopressors from Baseline**

21 **ATHOS-3**

22 **Dosing and Titration**

23 **Multivariate Analysis of Obtaining Target MAP at Hour 3 (mITT)**

24 **Adverse Reaction**

25 **Conclusion**

- Angiotensin II effectively increased blood pressure in patients with vasodilatory shock that did not respond to high doses of conventional vasopressors
- Limitations:
  - Primary endpoint of increase in MAP of ≥ 10mmHg or a MAP >75mmHg within 3 hours showed little difference over time
  - Angiotensin II only reduced norepinephrine use minimally
  - Long term safety?

26 **Angiotensin II Utilization Criteria**

1. Hypotension in the setting of high output shock
2.
2.

27 **Angiotensin II Utilization Criteria**

1. Hypotension in the setting of high output shock

WAIT...

But how can I determine a patient has High Output Shock from the verification room?

28 **How to Determine High output Shock**

- Flo Trac
  - Minimally invasive cardiac output monitoring
  - Pressure readings from the arterial line calculate the cardiac output (CO) and other derived parameters
  - Uses pulse contour analysis based on the manufacturer’s patented algorithms

29 **Interactive Flowsheet**

30 **Interactive Flowsheet**

31 **Angiotensin II Utilization Criteria**

1. Hypotension in the setting of high output shock
2. Admission to MICU/SICU (HVCC if meeting criteria #1)
3. NE/Epi > 0.6 mcg/kg/min + vasopressin 0.03 units/min for at least four hours
4. Strong recommendation to attempt replacing NE with epinephrine
5. Approval by an ICU attending
6. VTE prophylaxis (heparin or enoxaparin) if no contraindications

Non-responders:

- MAP increase by less than or equal to 10 mmHg or NE/EPI dose still > 0.3 mcg/kg/min

1.

32 **Giapreza (Angiotensin II) Powerplan**

33 **Reconstitution & Delivery**

- Reconstitution:
-
-
- Undiluted vials are stored in the refrigerator
- Diluted solution may be stored at room temperature or under refrigeration
- Discard prepared solution after 24 hours
- Do-Not-Tube Medication
-

34 **Estimated Institutional Drug Expenditure**

35 **Special Population Consideration**

- Safety in pediatrics, geriatric, and pregnancy
- There is an ongoing clinical trials for septic shock in pediatrics (phase 2 not sure about the rest of the status of this)

36 **Drug-Drug Interactions**

- Angiotensin Converting Enzyme (ACE) Inhibitors increase the response to angiotensin II
- Angiotensin II Receptor Blockers (ARB) decrease the response to angiotensin II
-

37 **Off Label Uses**

- ACE inhibitor overdose
- Post cardiac surgery vasoplegia
-
- If requested for these indications, requests need to go through non-formulary pager

38 **Patient Case**

- 40 y/o Male
- PMH: Major depressive disorder

- Found down by family hypothermic, tachycardic, tachypnic, and hypoxic to 86%
- Intubated for low GCS and respiratory failure
- CXR: Diffuse opacities bilaterally, RLL predominant disease pneumonia not excluded
-

39 **BP/MAP Trend Over the First 12 hr**

40 **BP/MAP Trend Over the First 12 hr**

41 **Responder or Non-Responder?**

42 **Poll Question**

- A 75 YOM is admitted to the medical ICU with septic shock on max dose of norepinephrine and vasopressin. Despite these interventions, the patient's MAP is 50. The provider ask you to dose angiotensin II for this patient.
- Based on current literature, what starting dose would you recommend?

43

44 **Poll Question**

- What is the AWP cost per day of angiotensin II for an 80 kg patient with a rate of 20 ng/kg/min and how should this medication be delivered?
-

45

46 **Take Home Points**

47 **ETHOS Attendance Code**

Text Attendance Code to 413-200-2444
TEVCES

48