STANDARD LOWER MAP GOAL IN PATIENTS WITH SEPTIC SHOCK

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OBJECTIVES

• Identify patient populations that may benefit from a lower MAP goal during septic shock

• Explain risks associated with targeting a lower MAP goal during septic shock
SEPSIS GUIDELINES

- We recommend an initial target mean arterial pressure (MAP) of 65 mm Hg in patients with septic shock requiring vasopressors (strong recommendation, moderate quality of evidence).

- We recommend to initially target a MAP of ≥65 mmHg. **Recommendation. Level 1; QoE low (C).**
AUTOREGULATION

Cerebral blood flow is maintained around 50ml/100g/min within the normal range of cerebral perfusion pressures.
OPTIMAL MAP GOAL

- MAP target that is too low may be associated with organ hypoperfusion
- MAP target that is too high may be associated with ischemic injury due to excessive vasoconstriction.
SEPSISPAM TRIAL

- Multicenter, randomized, open label, controlled trial
- N=776
  - MAP goal 65-70 mmHg (n=388)
  - MAP goal 80-85 mmHg (n=388)
- Setting: 29 French centers
- Enrollment: 2010-2011
- Follow-up: 90 days
- Analysis: Intention-to-treat
- Primary outcomes: All-cause mortality at day 28

SEPSISPAM TRIAL

For patients with septic shock, a goal MAP of 80-85 mmHg does not reduce all-cause mortality at 28 days (or 90 days) when compared to a goal of 65-70 mmHg.

- The higher MAP goal was associated with reduction in rates of renal dysfunction (and RRT) for patients with a history of chronic hypertension.
- High MAP targets are associated with adverse effects from the catecholamine infusions.

SEPSISPSAM TRIAL

• The infusion rates of vasopressors were significantly higher.

• Duration of vasopressor treatment significantly longer, in the high-target group than in the low-target group.

• The optimal blood pressure target likely ranges from 65 to 85 mm Hg and PROBABLY lies between 65 and 75 mm Hg in most patients.

MAP TARGET ABNORMALITIES

- MAPs in the low-target group (65 to 70 mm Hg) were for the most part ACTUALLY between 70 and 75 mm Hg.

- Values in the high-target group (80 to 85 mm Hg) were also ACTUALLY higher ranging between 85 and 90 mm Hg.

MAP TARGET ABNORMALITIES

- Poukkanen et al., found that patients spent more than 75% of the time at a mean arterial pressure of more than 70 mmHg.

- Leone and colleagues found that a MAP goal was pre-fixed in only 70% of patients with septic shock.
  - MAP ≥ 65 mmHg

- Lamontagne et al., noted MAP was frequently above the prescribed range.

- Role of monitor alarms
118 patients were enrolled from 11 centers in Canada.

Risks of cardiac arrhythmias and hospital mortality were not different between lower and higher MAP arms.

Among patients aged 75 years or older, a lower MAP target was associated with reduced hospital mortality (13 versus 60 %, p = 0.03) but not in younger patients.

Nurses and physicians take great care to avoid under-dosing vasopressors, but may under-appreciate or under-value the potential risks of excessive vasopressor therapy in excess of prescribed.
TARGET POPULATION FOR LOWER MAP GOALS

• Per multiple guideline recommendations, all patients with septic shock should target MAP ≥65mmHg

• Populations where Lower MAP Goals have the highest recommendation:
  • Clinically-relevant bleeding
  • Major persistent arrhythmias
  • Myocardial infarction
  • Mesenteric ischemia
  • Distal-limb ischemia
  • ESRD patients

• Evolving literature in patients with TBI or delirium
  • Brain Trauma Foundation recommends a target CPP between 50 and 70 mmHg
RISKS ASSOCIATED WITH LOWER MAP GOAL

• ORGAN HYPOPERFUSION
  • Brain
  • Kidneys
  • Heart
  • Liver
  • Splanchnic System

• Caution should be taken in ALL patients in using MAP alone as surrogate of organ perfusion pressure, especially under conditions in which intracranial or intra-abdominal pressure may be elevated.

• Titration methodologies should be optimized to decrease wide variations in MAP while the patient is receiving catecholamines.

INDIVIDUAL TITRATION

• Tailored titration of catecholamines to each patient. Avoid wide fluctuations in MAP

• Establish an individualized target MAP goal based on the patient scenario

• Change alarm limits on the monitor to reduce nuisance alarms and to encourage nursing titration

• WEAN. Less is More.
SUMMARY

• Target a MAP of 65–70 mmHg in a patient with septic shock who does not have chronic hypertension.
  • It may be reasonable for the patient with chronic hypertension to target a MAP of 80–85 mmHg.
• Vasopressors are associated with adverse events.
• Liver dysfunction, mesenteric ischemia, or AKI that can be associated with septic shock may not only result from the disease, but also from excessive use of vasopressors.
• MAP target as low as 60 mmHg may be reasonable to reduce vasopressor requirement.
• Studies have demonstrated poor compliance with MAP goals.
• Establish an individualized target MAP goal based on the patient scenario.
BE A WEAN-ER
Per the Surviving Sepsis Guidelines, which of the following represents the target MAP goal for patients with septic shock
A) MAP ≥ 65 mm Hg
B) MAP ≥ 80 mm Hg
C) Targeted therapy based on comorbid conditions
D) SBP ≥ 90 mm Hg

Answer A is the correct answer because all others do not result in significant differences in mortality and allow for auto regulation of organ systems.
All patients with septic shock and a history of hypertension should receive a higher MAP goal.

A) True
B) False

Answer B is the correct answer because there is no difference in mortality rates in patients receiving the standard lower MAP goal and the higher MAP goal. Care should be tailored and individualized depending on the patient scenario.
REFERENCES

QUESTIONS?