ICU
MANAGEMENT & PRACTICE

Less is More in Shock Management

Permissive hypotension, phenotyping shock, vasopressor selection and timing, and emerging interest in beta-blockade for septic patients.

It is important to reconsider conventional aggressive approaches to shock management and explore the evolving concept of permissive hypotension. There is a need to avoid reflexively treating all hypotension with vasopressors or fluids and instead focus on patient-specific, physiology-driven decisions.

Permissive Hypotension

There is a conventional impulse to treat all hypotensive patients as though they are in shock. While shock remains a major contributor to mortality, hypotension alone does not always equate to tissue hypoperfusion. In certain patients, permissive hypotension—allowing lower mean arterial pressures (MAP), particularly near the 65 mmHg threshold—can be safe and appropriate when signs of adequate perfusion are present (Dünser et al. 2013).

Case Example 1:

An 89-year-old male with severe chronic hypertension was admitted with urinary sepsis and MAP readings below 60 mmHg despite fluid resuscitation. Remarkably, he showed no signs of end-organ hypoperfusion: his Glasgow Coma Score remained at 15, there was no mottling, and urine output was well above 0.5 mL/kg/h. Importantly, procalcitonin levels dropped quickly, suggesting an effective antibiotic response. No additional interventions were initiated. Over time, the patient's condition improved spontaneously, reinforcing the value of a watchful, conservative approach in select cases.

A recent French study showed that patients meeting criteria for permissive hypotension—normal consciousness, no mottling, and normal lactate—had better outcomes with less fluid administration, higher urine output, and shorter ICU stays (Lavillegrand et al. 2023). However, this strategy mandates vigilant monitoring and must not be used as a justification to avoid vasopressors when clearly indicated.

Understanding the Shock Phenotype

Treating shock requires identifying the correct underlying physiology. Aggressively escalating vasopressors without understanding the cause can be harmful.

Case Example 2:

A 71-year-old male with multiple comorbidities underwent elective aortic valve surgery and developed profound shock postoperatively. Despite high-dose vasopressors, his lactate was rising. A transoesophageal echo revealed ongoing hypovolaemia, leading to successful fluid administration and eventual weaning off vasopressors. This case illustrates how recognising hypovolaemic shock and tailoring interventions accordingly can prevent deterioration and guide successful recovery.

Vasopressin in Post-Cardiac Surgery Shock

Post-cardiac surgery patients present a unique subgroup for vasopressor management. The European guidelines increasingly recognise vasopressin as a valid alternative to norepinephrine in maintaining perfusion (Guarracino et al. 2021).

The VANCS trial, a randomised study of over 300 cardiac surgery patients, compared vasopressin to norepinephrine. Key findings included lower composite outcome of major complications in the vasopressin group, significantly fewer renal complications (AKI) and atrial fibrillation and reduced vasopressor duration, ICU stay, and hospital stay (Hajjar et al. 2017).

While promising, cardiac surgery patients represent a distinct subset, and the findings may not generalise to broader ICU populations.

Vasopressin and Septic Shock: Timing is Critical

Case Example 3:

A retired urologist presented with classic signs of septic shock: profound hypotension, elevated lactate, and AKI. Early antibiotics, fluids, and norepinephrine were initiated. He responded well, and norepinephrine requirements began to decline.

The VANISH trial demonstrated no significant mortality difference between norepinephrine and vasopressin but suggested benefits in patients with less severe shock (e.g., norepinephrine dose <15 µg/min) (Russell et al. 2008). Timing, rather than absolute dosage, may be key: earlier vasopressin initiation correlates with better outcomes in several studies.

Another consideration is drug formulation. Many European ICUs use noradrenaline tartrate, which is half as potent as base noradrenaline. This distinction matters when interpreting dosing thresholds for vasopressor escalation.

Beta-Blockade in Septic Shock

The idea of heart rate control in septic shock is gaining interest, particularly in patients with persistent tachycardia despite initial resuscitation.

The Morelli trial showed that esmolol reduced heart rate in septic shock without compromising haemodynamics, though the study had limitations, including very high fluid volumes and unusually high mortality (Morelli et al. 2013).

The more recent Landi-SEP trial, the largest of its kind, followed similar inclusion criteria and showed effective heart rate reduction with landiolol, no major impact on blood pressure and a trend towards higher norepinephrine requirements (though not statistically significant) (Rehberg et al. 2024).

Heart Rate Control

Case Example 4:

A 60-year-old man with new-onset atrial fibrillation and a rapid ventricular rate (RVR) was admitted to the ICU. He initially received beta-blockers and amiodarone. After a sudden heart rate drop to 70 bpm, he collapsed, developed severe hypotension, high lactate, and required vasopressor and inotrope support. This underscores the risk of aggressive heart rate control in patients who may rely on compensatory tachycardia to maintain cardiac output (Morelli et al. 2013).

Conclusion

There is a need for a more nuanced, physiologically tailored approach to shock management. Permissive hypotension may be safe in selected patients without tissue hypoperfusion. Understanding the shock phenotype is essential before escalating therapy. Vasopressin has emerging evidence, especially in post-cardiac surgery and early septic shock. Beta-blockade is promising but should be approached cautiously. Clinicians must remain vigilant, avoid algorithmic thinking, and focus on close patient monitoring and individualised care. By adopting a "less is more" philosophy, particularly in stable or borderline patients, critical care teams can improve outcomes while avoiding the risks of overtreatment.

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