

Fluid management in critically ill patients

Case presentation

A 72-year-old man was admitted to an emergency room with pneumonia, sepsis and hypotension. There was a previous history of DM, COPD, CKD, and IHD. He received 2.5 liters of normal saline and broad spectrum antibiotics in the emergency department. Mechanical ventilation was started because of severe hypoxia and confusion. Several hours later, he was transferred to the ICU. The body weight was 75 kg. The ICU findings included the followings:

- T: 39° C, HR:110, BP: 80/50 mmHg
- Physical exam: 2+ peripheral edema
- CVP:14 mmHg
- Mechanical Ventilation Mode: SIMV (Intermittent spontaneous breathing)
- O₂ saturation: 97%
- Cr: 1.7 mg/dL
- Tidal volume: 400 mL
- ECG: Frequent PVC (No finding in favour of acute ischemia)
- Cardiac Ejection Fraction: 40%
- WBC: 20,000
- Lactate: 6.2 mmol/L

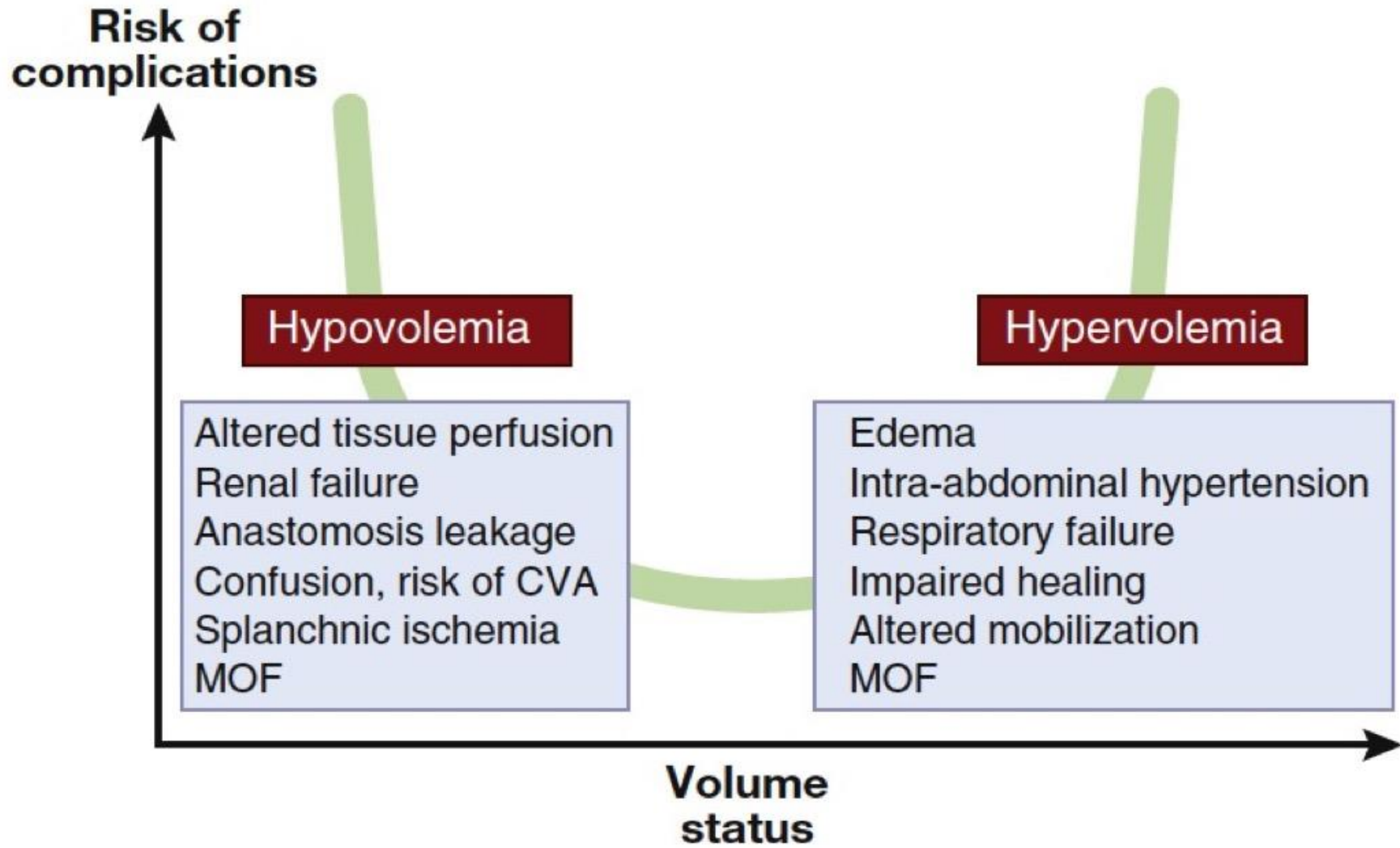
Should we give him more fluid?

Findings indicating that volume administration may be helpful

- The presence of fever
- Tachycardia
- Elevated lactate
- Hypotension

Findings indicating that more fluid administration may be harmful:

- Peripheral edema
- CVP:14 mmHg
- Already receiving 2.5 L of intravenous fluids
- Cardiac history



Questions:

- How to assess fluid situation in critically ill patients?
- What are the methods to predict fluid responsiveness in ICU patients?
- What are the four stages of fluid therapy?
- What are the principles of fluid management in critically ill patients?
- What factors should be considered in choosing intravenous fluid types?
- How kidney function is affected by intravenous fluid administration?
- What strategies are recommended for fluid management in patients at risk of AKI or with AKI?