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Personalising Fluid Therapy in Septic Shock

Volume expansion, the initial therapeutic measure for septic shock, involves the intravenous injection of a few hundred millilitres of fluid over a few minutes. However, using fluids in septic patients is a complex strategy, with various types of fluids available. The effects of fluid boluses are inconsistent and transient, and fluids carry risks, especially during septic shock. There are also questions about which fluid to choose, whether to infuse it, how to evaluate its risk, how to refrain from infusion, and how to predict and evaluate its effects.

Fluid therapy during septic shock aims to improve cardiac output and tissue oxygenation but faces two challenges: inconsistent and transient efficacy and well-documented adverse effects. Personalisation of treatment for circulatory failure based on patient characteristics and the clinical situation is recommended at all stages of the condition. Regarding the choice of fluid for volume expansion, it is important to consider that isotonic saline may cause hyperchloraemic acidosis, but typically only with very large volumes administered. Reserving balanced solutions for patients who have already received large volumes of fluids and are experiencing rising chloremia levels is recommended.

The initial volume expansion in septic shock, aimed at compensating for constant hypovolaemia, should not only be based on the patient's weight, as suggested by the Surviving Sepsis Campaign. It should also take into consideration potential absolute hypovolaemia caused by fluid losses. Following the initial fluid infusion, preload responsiveness may diminish quickly and should be assessed. The selection of tests for assessing preload responsiveness depends on factors such as the presence or absence of mechanical ventilation, the monitoring methods in place, and the risk of fluid accumulation. The passive leg-raising test and the mini-fluid challenge are appropriate for assessing preload responsiveness in non-intubated patients. For patients without cardiac output monitoring, tests such as the tidal volume challenge, passive leg raising test, and mini-fluid challenge can be utilised as they can be performed by measuring changes in pulse pressure variation, assessed through an arterial line. It is best to avoid repeating the mini-fluid challenge in patients who have already received substantial fluid volumes.

The variables for assessing fluid accumulation vary based on the clinical condition. In ARDS, pulmonary arterial occlusion pressure, extravascular lung water, and pulmonary vascular permeability index are better indicators for assessing the risk of worsening alveolar oedema than arterial oxygenation. Consideration of intra-abdominal pressure is important in cases involving abdominal problems. Fluid depletion during de-escalation is considered in patients with significant fluid accumulation. Preload responsiveness testing can guide fluid removal, as patients with a preload-dependent state are at risk of haemodynamic deterioration.

Source: Critical Care

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