Guiding Fluid Management in Critically Ill Patients with Acute Kidney Injury: Role of Noninvasive Assessment of Stroke volume

Thesis

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By

Ihab Abdelrahman Alsayed
M.B.B.Ch

Supervisors

Prof. **Rania Mostafa Alhusseiny**
Professor of Critical Care Medicine
Faculty of Medicine, Cairo University

Dr. **Hassan Sameer Effat**
Assistant Professor of Critical Care Medicine
Faculty of Medicine, Cairo University

Dr. **Waleed Farouk Mahmoud**
Lecturer of Critical Care Medicine
Faculty of Medicine, Cairo University

Faculty of Medicine
Cairo University
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ABSTRACT

Background: Acute kidney injury (AKI) occurs in up to 50 % of patients admitted to the intensive care units. Optimization of volume status is a challenging step in management of AKI patients.

Methods: This study was conducted on 40 critically ill patients with AKI. Patients were randomly divided into 2 groups: group A; volume status was optimized by CVP/▲CVP and group B; volume status was optimized by passive leg raising (PLR) and fluid challenge induced stroke volume variation (SVV) using echocardiography. Both groups were compared regarding outcome.

Results: No significant difference in both groups regarding any of the baseline characteristics. Group A received more fluids compared to group B after 48 h (3.7 ± 0.7 VS 2.2 ± 0.6 liters respectively, $p < 0.001$). This was associated with increased morbidity and mortality. In group A, the need for mechanical ventilation (MV) was higher (p 0.048), the duration of MV was longer (p 0.04) with larger number of patients failed weaning (p 0.036). The need for vasopressors was higher in group A (p 0.019) with more patients in need for RRT compared to group B, but it didn't reach statistical significance (p 0.2). No difference between the two groups regarding the length of ICU stay (12.10 ± 11.83 days in group A versus 6.35 ± 3.86 group B, P value 0.183). However, the mortality rate was higher in group A (40%) compared to group B (10%), p 0.028

Conclusion: The use of SVV for guiding fluid therapy in AKI patients was associated with less fluid intake, less morbidly and mortality compared to CVP/ΔCVP.

Key words: Acute kidney injury, volume status, PLR, fluid challenge, SVV, echocardiography, CVP, morbidity, mortality.