Fluid Overload in the PICU: Still a Challenge

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It was with great interest that we read the article by Fuhrman et al, recently published in *Journal of Pediatric Intensive Care*, about the “medication use as a contributor to fluid overload in the pediatric intensive care unit (PICU).”¹ This is a subject of great concern in pediatric and neonatal (which is not addressed in the article) critical care and we would like to contribute with some notes and questions.

First of all, the reason for admission in the PICU and why the patient is under mechanical ventilation (MV) has an important role in fluid management. Let us imagine two different scenarios: (1) the patient had sepsis and had an aggressive fluid resuscitation; or (2) the patient is under MV because of bronchiolitis. The fluid management is unlike in different scenarios. Unfortunately, in this study, there were only nine patients with sepsis and none with bronchiolitis. We think that including all patients, with such distinct diagnosis, in the same statistical analysis should introduce a bias in the study.

Another point of specific interest is the patients with sepsis. The endothelium barrier dysfunction is well known in septic patients, and therefore these patients may have a distinct behavior in terms of fluid overload compared to patients with other diagnosis. How was the fluid resuscitation on these patients? How much and what kind of fluid they have received before, or during, fluid resuscitation? There are a few studies showing that fluid resuscitation may interfere in the outcome of these patients.^{2–4} We also know that vasoactive agents may play a role in diuresis and fluid balance. Which patients received vasoactive agents, and how was their outcome?

Another point of concern is the nutritional status of patients, since it is relevant in settings with malnourished patients.⁵ The fluid and nutritional management of these critical patients are

challenging and deserve special attention and specific studies to better understand their pathophysiology.

Although it is well described in the limitations of the study, we missed a larger sample size (duration of the study). If more patients would be included, the analysis would gain strength to demonstrate the association of fluid overload with acute kidney injury as in the study by Li et al.⁶

That said, we congratulate the authors for the elegant study.

Conflict of Interest

None.

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