

What is Ideal Maintenance Intravenous Fluid in Children?

We read with interest the recently published randomized controlled trial and accompanying editorials on the choice of maintenance fluids in hospitalized sick children [1-3]. We have following comments:

1. How do we use the results of the study by Shamim, *et al.* [1] in routine clinical practice? The external validity of the study is quite limited as there were so many exclusions.
2. The reason for 60% restriction of isotonic fluid is contrary to current recommendations of giving normal volume of maintenance fluids in common conditions such as bronchiolitis [4], and meningitis [5]. Authors have themselves acknowledged the risk of dehydration and hypernatremia with continued administration of restricted volume isotonic fluids beyond 24 hours. This leaves us in dilemma about with a difficult choice of the type of maintenance fluids to be used beyond 24 hours of hospitalization.
3. In view of the high incidence of hyponatremia associated with the use of 0.18% NaCl in 5% Dextrose as maintenance fluid, its use is no longer justified in current pediatric practice.

Keeping these points in mind, there is need of large pragmatic trials to provide answers to questions not addressed by the present trial.

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Ideal Maintenance Intravenous Fluid in Children: Author's Reply

Readers have raised some very valid points: our reply is as follows:

1. In our study [1], exclusions were made for the conditions that already have protocol-based management (e.g. hyponatraemia, hypernatremia, shock congestive heart failure). Some of the conditions, were excluded to prevent sampling bias (e.g. (pre-existing diuretic use or edema). Therefore, results of our study can be used for empirical fluid therapy in most sick children. However, large randomized trials with multiple arms may determine the appropriate empirical fluid therapy in remaining situations.
2. Energy expenditure in critically ill children has been found to be as low as 50- 60 Kcal/Kg/day, by indirect calorimetric measurements [2]. Fluid requirement is much less in critically ill children for a variety of reasons such as physical immobility, the use of muscle relaxants and sedatives, mechanical ventilation, and additional factors such as nonessential or facultative metabolism. Moreover, fluid requirement is further decreased because of inappropriate increase in arginine vasopressin which impairs the kidney's ability to excrete free water.
3. There is enough evidence to support high incidence of hyponatremia with the use of 0.18% NaCl in 5% Dextrose as maintenance fluid. Therefore, we agree that its use is no longer justified in current pediatric practice.

Further studies with a larger sample size and an additional control arm using standard volume isotonic fluids may determine the overall benefit and safety of volume reduction and other queries not addressed by our trial.

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