

LETTER

Isotonic saline – the only solution to recommend?

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See related viewpoint by Guidet *et al.*, <http://ccforum.com/content/14/5/325>

I read with interest the viewpoint by Guidet and colleagues addressing controversies regarding colloid solution carrier fluids [1]. Instead of offering a balanced view, however, the article focused on the refutation of dilutional hyperchloraemic acidosis, depicting it as a clinically innocent inevitability we should accept rather than try to avoid.

The authors initially forward the view that ‘unless recommendations are based on high quality primary research ... clinicians would be better off making clinical decisions on the basis of primary data’ – just to end doing the opposite by recommending against the use of balanced colloid solutions based on ‘limited published information’ [1]. To the best of my knowledge there are no published data suggesting adverse effects of balanced solutions compared with isotonic saline, yet there remains the (non?)issue of hyperchloraemic acidosis.

Sound judgement suggests that if a clinical uncertainty can be avoided without suggestion of doing harm, then a clinician may expect to be allowed the freedom of making such a choice.

The conclusion this review should have is the one it begins with – the informed clinician should be left to make the decision in which patients to use a balanced colloid and in which to use an isotonic saline-based solution, until evidence for clear benefit or harm can be demonstrated, as recently suggested by one of the authors herself [2].

Since no data suggestive of balanced colloid being inferior to saline-based solutions are presented, it seems unusual to forward opinions dismissive of existing non-inferiority evidence since non-inferiority trials have become the mainstay for introducing new drugs [3].

Authors' response

Bertrand Guidet

We believe we provided strong evidence demonstrating that dilutional-hyperchloraemic acidosis is observed only with a large volume of isotonic saline, is transient and is not associated with adverse effects.

As a matter of fact, if colloid is used as part of fluid resuscitation, the total infused volume is much smaller compared with a crystalloid-only strategy. As a consequence, the chloride and sodium load is reduced. Moreover, the use of balanced crystalloid together with an artificial colloid is able to reduce the additional benefit of using a balanced colloid. The benefit of a balanced solution in terms of pH is reduced in cases of pre-existing acidosis with low serum bicarbonate [4].

Among the 10 articles dealing with balanced colloid solutions, eight were from the same author and the only study documenting superiority of balanced hydroxyethyl starch over albumin has been retracted [5]. Other articles

are testing the effect of American balanced starches (that is, Hextend®; Biotime Inc., Berkeley, CA, USA) with a very high molecular weight and substitution ratio. Because of adverse effects on coagulation and renal function, these hydroxyethyl starches are not prescribed in Europe.

In balanced solution, the partial substitution of chloride by acetate might have a potential harmful effect with nitric oxide release, reduction of cardiac output and hypotension. One must remember that acetate has been banned by nephrologists in haemodialysis.

We do not advocate the use of balanced colloids, but balanced crystalloids may be of value for physicians using large volumes of crystalloids as the only resuscitation fluid.

Competing interests

BG: Honoraria and financial reimbursements from Fresenius Kabi for lecturing and authorship. Honoraria from Laboratoire Français du Fractionnement et des biotechnologies for lecturing. Principal clinical investigator of a randomised controlled trial testing the effect of voluven on hemodynamic and tolerability of Enteral Nutrition in patients with severe sepsis (CRYSTMAS trial), sponsored by Fresenius Kabi. KO declares that he has no competing interests.

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References

1. Guidet B, Soni N, Rocca GD, Kozek S, Vallet B, Annane D, James M: **A balanced view of balanced solutions.** *Crit Care* 2010, **14**:325.
2. Kozek-Langenecker SA: **Influence of fluid therapy on the haemostatic system of intensive care patients.** *Best Pract Res Clin Anaesthesiol* 2009, **23**:225-236.
3. Soonawala D, Middelburg RA, Egger M, Vandenbroucke JP, Dekkers OM: **Efficacy of experimental treatments compared with standard treatments in non-inferiority trials: a meta-analysis of randomized controlled trials.** *Int J Epidemiol* 2010, **39**:1567-1581.
4. Carlesso E, Maiocchi G, Tallarini, Polli F, Valenza F, Cadringer P, Gattinoni L: **The rule regulating pH changes during crystalloid infusion.** *Intensive Care Med* 2010, in press. [Epub ahead of print]
5. Shafer SL: **Shadow of doubt.** *Anesth Analg* 2011, **112**:498-500.

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