Reviewer's report

Title: Zero Balance Ultrafiltration Using Dialysate during Nationwide Bicarbonate Shortage: A Retrospective Analysis

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Reviewer: Peter Alston

Reviewer's report:

This paper reports a study examining the effects of changing solutions given during zero balance ultrafiltration from normal saline to a dialysate solution. The paper has a number of limitations

Page 2, line 26; the concentration of sodium chloride solution should have be stated.

1. The introduction section should have concluded with a hypothesis and aim for the study.

2. The authors state that the study had approval from their Institutional Review Board. The reference number and date of the letter of approval should have been supplied.

3. A description of how the electrolytes and bicarbonate were measured should have been provided along with any evidence to support the reliability of the technique.

4. A description of how patients who underwent ultrafiltration were identified should have been presented.

5. An explanation why the study population sample size and why the time periods was were chosen should have been given.

6. The T-test is properly known as Student's t-test.

7. An explanation of how the distribution of the data was examined to determine that is was normal would have been valuable.

8. The results are reported as 'serum' concentrations. If they were measured by a blood gas analyser the concentrations were measured in whole blood so they should be reported as 'blood' concentration.
9. Rather than using blood bicarbonate concentration as an estimate of metabolic acidosis, something like standardised base excess would have been better as it controls for arterial carbon dioxide tension (PaCO2). It would have also been useful to report PaCO2 as well.

10. The design of the study is a retrospective, observational one using historical controls and this point should have been clarified in the methods section and abstract.

11. There is unnecessary duplication of information presented as text, tables and figures. Tables make data more accessible than text their use to report all the data would have sufficed with explanatory text in the results section. The figures added little value to the interpretation of the data and they could have been omitted.

12. Changes in variable would have been better presented as mean change with 95% confidence intervals as this would have enabled meaningful comparisons.

13. Multiple statistical analyses have been undertaken inflating the risk of Type 1 statistical error. This of error could have minimised by nominating a primary outcome and controlling the risk in the secondary outcomes using something like Bonferroni's correction. In addition the number of tests could have been significantly reduced by comparing the changes variables groups rather than the point variables.

14. Including the word safe in the conclusion and abstract is unjustified given the profound weaknesses of the study design and small sample size.

15. The mean volumes of replacement fluid for each group should have been reported.

16. Page 6, sentence beginning line 43: presumably the authors mean sodium bicarbonate 8.4% solution rather that bicarbonate by itself.

17. The author's might be interested in a study of similar design as a historical precedence for their study design. Alston RP, Theodosiou C, Sanger K: Changing the priming solution from Ringer's to Hartmann's solution is associated with less metabolic acidosis during cardiopulmonary bypass. Perfusion 22:385-9, 2007
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