Reviewer's report

Title: Comparison of Clinical and Biochemical Markers of Dehydration in Children: A Prospective Double-cohort Trial

Version: 1 Date: 11 March 2014

Reviewer: Jonathan Miller

Reviewer's report:

Major Compulsory Revisions:
1. In Materials and Methods, paragraph 1: the study is called a Prospective Double Cohort Control Trial. In fact, this is actually a Prospective Double Cohort Trial. There are two separate cohorts, one exposed to dehydration and one not exposed to dehydration. A true control for the gastroenteritis group with dehydration would be a gastroenteritis group without dehydration (same population without the exposure).
2. Materials and Methods, paragraph 4: In what time frame were the lab data collected (on presentation prior to IV rehydration)?
3. Materials and Methods, under Calculations and Statistical Analyses, paragraph 1: the percent dehydration calculation is actually the fraction dehydration calculation. To be a percent, it should say "x 100"
4. Results, paragraph 1: this says there are 73 children in the experimental group and 143 children in the "control" group (see above) from a total of 215 patients. However, 73 + 143 = 216. This error in calculation is also in Figure 1.
5. Discussion, paragraph 3: "we included a control group to strengthen our analysis" should be modified per #1 above to say that "we included a hydrated cohort to strengthen our analysis"
6. Discussion, paragraph 3: This should include a discussion of how the results could be affected by the differing age and gender of the two cohorts.
7. Discussion, paragraph 5: "...we believe employing the use of an independent control group..." per #1 above should read "...use of a hydrated cohort as a control group..."
8. Discussion, paragraph 7: Are the children with dehydration but not gastroenteritis included in the musculoskeletal injury cohort? This further supports this study as a Double Cohort Study, not a Double Cohort Control Study. It is not controlled if both cohorts have potential to be exposed to the exposure of interest, dehydration. If not, this paragraph needs to be clarified. Also, it would help to explain why this is a "clinically relevant population." This paragraph is probably not necessary.

Minor Essential Revisions:
1. Materials and Methods, under Calculations and Statistical Analyses,
paragraph 1: "Comparisons were first made between the dehydration and the control group" - because this is a Double Cohort study without a true control, this should read "comparisons were first made between cohorts"

2. Discussion, paragraph 1: reads "Vega et al have demonstrated that in addition to serum urea, serum bicarbonate declines...". Should this read, "Vega et al have demonstrated that in addition to serum urea increasing, serum bicarbonate declines..."?

3. Discussion, paragraph 5: "Findings based on data from these 77 patients were than..." should say "Findings based on data from these 77 patients were then...

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.