Reviewer’s report

Title: Relationship between hyperglycemia, hormone disturbances, and clinical evolution in severely hyperglycemic post surgery critically ill children: an observational study

Version: 1 Date: 23 January 2014

Reviewer: E. Vincent Faustino

Reviewer’s report:

Major compulsory revisions:

1. The small sample size restricts adequate assessment of clinical outcomes. Presented are statistically significant bivariate analyses, which are not significant when adjusted for severity of illness. I would recommend deleting clinical outcomes in the text. It would be fine to include them in a table that describes patient characteristics and outcomes.

2. There are so many comparisons made in the study, which makes it hard to understand the point of the study. I would recommend focusing on a limited number of analyses that will give the readers an idea of what the authors are investigating. The results section can be broken down into sub-sections to make concepts more precise and concise. Correlations can be deleted. Temporal changes in hormone levels are better presented as figures.

3. The subgroup analysis on post-op cardiac patients should be justified. Defining a subgroup within a small group of patients worsens the power of the analyses.

4. I recommend having the discussion revised to provide a clear and concise description of what’s going on with the hormone levels they found in their study and how these fit to what we already know.

Minor essential revisions:

Abstract

1. It is unclear what is meant by clinical evolution.

2. Please spell out severity of illness scores. Readers who are not pediatric intensivists will likely not know what PIM2, PRISM or PELOD scores are.

3. It is unclear how #cell function and insulin sensitivity are defined. I suggest having a brief definition of the 2. I also suggest including the actual results and not the interpretation in the “Results” section of the abstract.

Introduction

4. As in the abstract, it is unclear what is meant by clinical evolution.

Methods

5. Please give a brief description of the severity of illness and inotropic scores for non-pediatric intensivists.
6. Please describe HOMA briefly.

7. Why was a subgroup analysis of cardiac patients done? Please include the justification in the introduction.

Results

8. Can you explain why the mortality in your patients is so high? It also does not make sense to me why the PRISM and PIM2 scores differ by about 10%. The 2 scores are usually close to one another. Noscomial infection is also very high. I’m concerned with potential selection bias.

9. #-cell function and insulin sensitivity were not defined but it looks like they were assessed with HOMA. A brief description of HOMA will clarify this. Please see comment above.

Discussion

10. Description of HOMA should be in the introduction or methods.

11. It is unclear how the authors can conclude that their study confirms that hyperglycemia is simply a marker of severity of illness.

12. Making conclusions on patient outcomes will be severely limited because of the small sample size. Absence of proof is not proof of absence. The fact that only severity of illness scores are the only factors association with mortality and length of stay is likely because there are not enough patients to evaluate. I recommend deleting all discussions pertaining to patient outcomes.

Discretionary revisions:

Introduction

1. Rather than stating that the incidence of hyperglycemia is high, please provide actual values.


Methods

3. Please spell out acronyms when first used.

4. No need to state that children <1 month or >16 years were excluded. That’s understood based on the inclusion criteria.

5. Please change informed consent to parental permission. Children cannot provide consent. They can give assent, though.

Results

6. Consider having a table with all patient characteristics.

Tables

7. Table 1 and 2 are better presented as figures.

8. Table 3 and 5 can be deleted. It does not add much information and unnecessarily complicates the manuscript.
9. Table 4 can be included in a table with patient characteristics and outcomes.
10. Figure 1 can be deleted.

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

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests.