Reviewer's report

Title: Gastrointestinal failure in intensive care: a retrospective clinical study in three different intensive care units in Germany and Estonia.

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Reviewer: Bekele Afessa

Reviewer's report:

General
Reintam and co-workers have addressed a clinically important issue. They have clearly outlined the background of the research question and the paucity of data addressing the issue. They have also clearly stated their objectives as being to describe the incidence of gastrointestinal (GI) failure, identify the risk factors associated with it and its impact on outcome. I believe they have met their first objective. I also believe they have enough data to describe the risk factors and the impact on patient outcome associated with GI failure. However, because of some limitations in their methodology, the study has not met the other two objectives. Since some of the messages may not have been communicated in the manuscript, I also recommend some English editing of the language.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1. The introductions clearly outlines the importance of the gastrointestinal system in critically ill patients and the gap in knowledge that necessitated the study.
2. The method section should provide a more detailed description of the patient population and the settings. The specific reasons for ICU admission and underlying co-morbidities should be described. Were there any patients admitted for GI reasons (medical or surgical)? The number of beds and the staffing (physician, nursing, etc) should be described.
3. The main objectives of the study were to describe the incidence of GI failure and the risk factors associated with it as well as its impact on outcome. The comparison of the three intensive care units does not add any pertinent information to the objectives of the study and some of it should me deleted. Description of the three ICUs is adequate.
4. The statistical section needs to be rewritten. I have a hard time in understanding how the data were analyzed. I assume the authors first performed univariate analysis to identify variables associated with the development of GI failure and then developed a logistic regression model by including the predictor variables with a P value of < 0.05. I again assume the AUC was calculated from the logistic regression model. All these should be clearly stated.
5. The authors have clearly highlighted the fact that one of the reasons gastrointestinal failure did not get the attention it deserves was due to lack of acceptable definition. They used food intolerance, gastrointestinal (GI) bleeding and ileus to define GI failure. This is a good start. However, the definitions they used for food intolerance and ileus are incomplete. Ileus is not defined. Food intolerance may result from causes other than nausea and vomiting. For example diarrhea is one of them. There may also be non-GI etiologies leading to food intolerance.
6. In the results section, the authors mention that 48 variables from the firs ICU day were analyzed to assess the risk factors for GI failure. These variables should have been mentioned in the methods section. Moreover, the authors mention that the change in SOFA score during the first two days is a risk factor for GI failure. When talking about risk factors, I suggest looking at the first day variables only.
7. In the results section, the authors state that GI failure was more common in patients who did not receive enteral nutrition on day 1. Since the definition of GI failure included food intolerance, this is the result of the definition. The reason why the authors did not find similar association in Berlin is probably due to the low incidence of GI failure.

8. Based on the logistic regression analysis, the authors calculated the predictive accuracy of the model. The authors need to tell us what the independent predictor variables were included in the model. I strongly recommend that the authors describe the variables independently associated with the development of GI failure.

9. I also suggest that the authors tell us the AUC (with 95% CI) of their model as well as its calibration. The isolated AUCs of SOFA and APACHE II (figure 1) are not adequate.

10. The authors also need to describe how they chose the cut-off points for calculating sensitivity, specificity and negative and positive predictive values of their model. They also need to describe all these predictive test results with their 95% CI.

11. The impact of GI failure on outcome is stated in the manuscript. GI failure increases mortality, duration of mechanical ventilation and length of ICU stay. However, the manuscript does not provide convincing evidence about the independent association of GI failure with these adverse outcomes. The data available in the study included APACHE II and SOFA. Was the association of GI failure with adverse outcome independent of the admission APACHE II and the SOFA score on the day GI failure developed?

13. The authors need to provide explanations for differences in the incidence of GI failure and outcome of patients among the different ICUs? For example, was stress ulcer prophylaxis administered in all ICUs?

14. The time of onset of GI failure should be described.

15. In the discussion section, the authors have mentioned some of the variables associated with GI failure. This should be stated in the results section.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Discretionary Revisions (which the author can choose to ignore)

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

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

Quality of written English: Not suitable for publication unless extensively edited

Statistical review: Yes

Declaration of competing interests:

I declare that I have no competing interests.