Author's response to reviews

Title: Risk Prediction Score of Death in Traumatised and Injured Children

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Author's response to reviews: see over
26 January 2014

Dear Dr. O’Donovan,

Please find attached our revised manuscript MS: 5002842721130190 – “Risk prediction score for death of traumatized and injured children”, which we would like to resubmit for consideration for publication in *BMC Pediatrics*.

We greatly appreciate the thoughtful and constructive criticisms of the Associate Editor and the reviewers. I have addressed each of their concerns in my responses below, and in the revised manuscript. We hope you will agree that the revised manuscript is now suitable for publication in *BMC Pediatrics*. We look forward to hearing from you at your earliest convenience.

Yours sincerely,

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Reviewer 1-Dr. Iolanda Jordan

Dear Dr. Iolanda Jordan,

Thank you for reviewing our manuscript. Your comments have helped us to improve it in many areas. We have made many changes to the manuscript, which is described below. We have resubmitted the revised manuscript.

1) Major Specific Concerns:

1.1) It will be necessary to review the English writing.

Answer:

All English writing has been reviewed again by Stephen Pinder who is a native English speaker and has long term experience on editing medical manuscripts in our faculty. The Edanz editing company has also edited the manuscript as recommendation.

1.2) An explanation about the utility of the score or not in other settings or countries may be useful, and compare the major causes of trauma with the literature too.

Answer:

About utility of our score:

Within scope of our study, we developed injury prediction score of death for Thai injured children among 34 multisite centers across country and internal validation. We have not performed an external validation to ensure that the benefits of our score in different countries or networks have not been tested. For these reason, we encourage staff in emergency settings to use our score in routine practice among internally validated sites and networks.

Score estimation requires the measurement of 10 variables, and it is easily calculated (Table 4). The risk classification feature of our score should aid in the determination of whether patients should be transferred from, or treated at, a particular trauma care center, given the acute care facilities, equipment, and health care personnel. Only a patient with a low risk classification should be treated at a trauma care level III–IV hospital. A patient is classified as at intermediate risk classification may be treated (with close observation) at a level II hospital or transferred to a level I facility. The outcomes will be compared and explored to find gap for improvement, and bring to develop the guidelines for trauma management of injured children in future.

The external validation is a next priority. A cross-sectional study that includes data from at least five provinces (one province for each region) will be collected using the same methods used in the score development phase. Development of portable personal computer software for score assessment is also necessary for widespread use of the
score. Software development may be performed in parallel with the external validation phase or may be delayed until the results of external validation are complete. Before transfer to the user, the software should be tested for errors and for user satisfaction, see page 18.

**Compare the major causes of trauma with the literatures:**

The leading causes of death among the countries have been demonstrated in the discussion paragraph as your recommendation to overview a big picture and different of trauma causes. It shows a variation of causes of death among western countries (US and European) and our country Thailand to demonstrate the big picture of death outcome as the reviewer comments, see page 13.

1.3) The score system with decimal numbers seems to difficulty the utility of the score. Please specify if there is any possibility or not for to convert this to an whole number.

**Answer:**

Some investigators have created risk prediction scores based on odds ratio (OR), which conversed an exponential of logistic coefficient to integer number (whole number). A benefit of using the OR is it is easy to remember a score (or weight) for each risk variable and thus easy to calculate at bed-side or at seen. However, there are some drawbacks of using OR compare to using coefficients as follows [1,2]:

1) The overall scores by OR-method are much different comparing to the overall scores created by coefficients. As a result, score’s performance including calibration and discrimination of the OR-method (integer number) is poorer than the coefficient method (decimal number of score).

2) Rounding up ORs is prone to mislead particularly when a factor has a protective effect, i.e., negative coefficient. For instance, a coefficient of -0.36 is resulted in the OR of 0.7. Rounding up this value yields the score of 1, reflecting a higher likelihood of the occurrence of interested event, where as in fact it should be decrease a risk of having the outcome.

That’s why we had created scores using original coefficients (decimal number of score) rather than ORs (integer number). Page 34

**Reference:**
2) Minor Specific Concerns

2.1) Page 6, line 6. When it’s said “Six domains of predictive variables were collected…” I count 7 variables, explain or correct please.
Page 6, line 9. In the sentence “…mechanism of injury (i.e., surgical perspective mechanism (blunt penetrating and both…) is missing the “)”.

Answer:
We have re-written to make this clearer, see page 6-7.

2.2) Page 6, third paragraph, the sentence “The SBP was categorized as abnormal if SBP < 60, < 70, < 70 + (2 x age in years), and < 90 mmHg for neonate, infants, 1-10, and
# 10 year is difficult to understand and may finish with a “;.” And after following with “Otherwise it was classified as normal PR was classified as tachycardia if PR >190, > 140…”

Answer:
The sentences have been edited so that they are easier and clearer to understand, see page 7.

2.3) Page 10 line 2 “Abnormal PR, RR, and SBP) were…” To eliminate “)”. The same page 13, line 16.

Answer: Done, see page 11.

2.4) Page 12. All first paragraph is like an abstract of the results. It will be better to intensifie this results in the discussion probably comparing with other literature.

Answer:
We had summarized our findings in the first paragraph of discussion which followed writing stylerecommendation by A-Z of medical writing of BMJ Books [1] and Cetin et al[2]. We also thought that after readers have read a lot of results, summarizingfindings will lead them moving to further comments and comparison of ours to findings from previous studies. We rather kept it as it was; hope you do not mind for this.

Reference:
2.5) Page 14. First paragraph “…and they are easily prone to hypoxemia and hypoventilation, although they only have simple upper airway obstruction.” Is irrelevant for the study it will be better to compare what adds to other scores.

Answer:
We cut the irreverent sentences which may lead to misreading and more confused. However, we have re-written this to make it more concisely, and compared this airway management factor with other literatures, see page 15.

3) Discretionary Revisions

3.1) Why age and weight are in different exposition (median and SD and mean and max-min respectively)?

3.2) Why age and weight are in different exposition (median and SD and mean and max-min respectively)?

It may help to understand the paper, signalling the number of patients (n) previous to the percentages. Especially when the author writes about the death.

Answer:
We reported mean (SD) for we described continuous data using mean and SD (e.g., age) if data were normal distribution, otherwise median along with min-max (e.g., weight) was applied. This has been added in statistical analysis part, see page 7.

Yours sincerely,

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Reviewer 2-Dr. Ozlem Koksal

Dear Dr. Ozlem Koksal,

Thank you for reviewing our manuscript. Your comments have helped us to improve it in many areas. We have made many changes to the manuscript, which is described below. We have resubmitted the revised manuscript.

1) Numerous Keywords

Answer:
We have reduced the number of keywords, see page 2.

2) Transfer route; What is difference between “own transport” and “non-ambulance”?

Answer:
We classified this variable based on actual type of transportation in our country, which were as follows: Own transport referred to transportation of patients using their own vehicles, Non-ambulance group referred to transportation by non-ambulance services which were organized by charity or foundation that are supervised by EMT or paramedics level. Ambulance service was conducted by doctors, emergency physicians and registered nurses or emergency nurses, see page 7.

Yours sincerely,

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