Reviewer's report

Title: Trauma management incorporating focused assessment with computed tomography in trauma (FACTT) - potential effect on survival

Version: 1 Date: 20 February 2010

Reviewer: Teun Saltzherr

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Major Compulsory Revisions

The authors describe the impact of a new evaluation and treatment algorithm (FACTT) combining whole-body CT (WBCT) with ATLS/ETC standards in severe trauma patients. In this interesting article the new algorithm is described into detail which can be helpful for other centers who want to implement WBCT/FACTT. They compare the outcomes within their hospital with national data from the DGU. Based on their findings the authors conclude that FACTT is fast, safe and may increase survival.

In general, the article could be more concise in order to bring the message to the reader more understandable. The article in its current form is too long and especially the methods and discussion section have to be reduced in length.

Second, what is ‘focussed’ in Whole-body CT imaging? ‘Screening’ or ‘Non-selective’ would be more appropriate.

The manuscript suffers from some weaknesses. My main concern is that the authors make the suggestion that the largest effects of FACTT come from the WBCT. However, in my opinion comparison of the Standardized Mortality Ratio (SMR) of the LMU with the DGU does not show the potential effects of the WBCT on probability of survival but the (potential) additional effect of the ATLS/ECT based workflow. Reason for this assumption is that patients with WBCT in the DGU group show no better survival rate (no significant SMR). Therefore, the better Ps in the LMU group has to be the result of other differences in protocol.

Second, we advise the authors to formulate their findings and conclusions carefully and based on their own data. For example, in the conclusion they state that FACTT reveals unexpected or hidden diagnoses with a major therapeutic impact. Although this might be true, this conclusion cannot be drawn based on the data presented. Another example is the statement in the discussion section that FACTT is certainly justified with regard to the increased radiation exposure as their population had a mean ISS of 32.5. However, this is not entirely true because the inclusion for registration in the DGU was an ISS #16. Therefore, the population of patients that did receive a WBCT but had an ISS of 15 or less was not assessed. Before such a conclusion can be drawn these numbers need to be analyzed.

Below are some specific remarks:
Abstract
Background:
- describe the aim of the study more clearly and specify the word impact.
- change ‘life threatening’ in ‘life-threatening’.

Methods:
- change ‘from the 2002 to 2004 DGU database’ in ‘from the DGU database from 2002 till 2004’.
- capitalize the first letters of the mentioned scores.

Background
- delete the second paragraph because it adds little to the manuscript. Instead describe into more detail which evaluation methods most hospitals use which participate in the DGU.
- the first time abbreviations are used they should be written out in full.
- change ‘instable’ into ‘unstable’.
- suggest changing ‘multislice’ in ‘4-slice’.

Methods
- suggest changing ‘stethoscope’ in ‘physical examination’.
- indications and exclusion criteria for WBCT in the LMU should be described in the methods section.
- to reduce the text in the methods section I suggest to delete the description on workflow in the LMU. This is already adequately presented in Figure 1.
- provide more information on the WBCT with respect to contrast-enhancement and arm repositioning, etc.
- was the inclusion period for both populations from 2002-2004?
- add the word ‘insertion’ after ‘chest tube’.
- capitalize the first letters of the mentioned scores.
- delete the paragraphs in which an explanation is given for the trauma scores. Instead I advise to provide references to articles or websites where an explanation can be found for the scoring systems. Furthermore, consider removing the paragraph on weaknesses of the TRISS to the discussion section.
- for the paragraph on validation of FACTT and WBCT see my general remarks.

Results
- why include 22 patients in the analysis when they did not receive WBCT? Suggest excluding these patients for analysis.
- delete the data on ‘whole collective’ in Table 1 for this is almost equal to the DGU data (comprises 97% of the same patients).
- reduce the amount of information given in Table 1. My suggestion is to delete
all prehospital information, delete heart rate and SBP and instead give % of patients with shock, delete Hb, PRBC (%), operation rate (%), MOF and NISS. Adjust the order of data in demographics, vital parameters and trauma scores. Furthermore, consider making an extra Table in which the 24-hour mortality and the GOS outcomes are presented. (Delete ‘Deceased (%)’ because this will confuse the readers with the GOS score of 1 having an other percentage).

- statistical analyses methods should not be described under the Table but in plain text in the methods section.
- in Table 2 there is no need to give 95% CI of normal percentages. In the SMR ratio this can be of value.
- the reduction in time to first chest X-ray and FAST could be an interesting finding. Why was there a reduction? If the authors have an explanation for this, I advise to mention this in the discussion section. If not, I suggest not mentioning these intervals because it distracts attention from the time to WBCT, which is the most interesting finding.
- in Figure 1: add an ‘a’ in pneumothorax. Change ‘repirator’ in ‘respiratory’. Add an interspace in central venous line. Add descriptions for all abbreviations used in Figure 1. Suggest presenting Figure 1 into ABCDE order of the ATLS guidelines.

Discussion
- the authors should discuss their findings such as reduction in time, increased Ps within their own center with respect to the current literature and current trauma care in the other centers of the DGU. By doing this, they will increase the readability of the manuscript and make it stronger.
- Discuss the potential biasses which could also contribute to the differences in LMU and DGU outcomes.
- the paragraph described in the methods about the weaknesses of TRISS and why they used both RISC and TRISS have to be described here. We also advise the authors to address their choice for using the TRISS while only 50% of the patients had available data for using TRISS.
- Delete or at least reduce all extra information on potential advantages of WBCT from other studies on which the current manuscript does not provide any data (e.g. missed injuries or therapeutic changes, etc.). This seems relevant but this article is not a review and therefore in my opinion literature related to the outcomes should be described.
- the REACT trial’s aim was to asses the effects of the location of the scanner, respectively in the trauma room versus in the radiology department, on several clinical outcomes and not the effects of WBCT as such.

If there are any questions please do not hesitate to contact me.

**Level of interest:** An article of importance in its field
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.