Reviewer's report

Title: Comparison of the effect of different infusion rates of sufentanil on surgical stress index during cranial pinning in children under general anaesthesia: a randomized controlled study

Version: 0 Date: 04 Sep 2017

Reviewer: Thomas Ledowski

Reviewer's report:

Dear Authors,

Thank you very much for submitting your manuscript! The topic is interesting and, at least in my view, relevant to our speciality.

However, I have various concerns and comments regarding the manuscript:

General comment:

1. Though the manuscript is certainly legible, it could improve from the input of an English native speaker. Especially some sentences in the results, as well as the discussion seem a bit awkward (forgive me here.....I do not speak a word of Korean, so I certainly do not judge you here): i.e. "Calculated SSI assessment during cranial pinning of head fixation did not exhibit the differences among the groups."

2. You call the method SSI. This term was abandoned by GE many years ago and it was since re-branded into "surgical pleth index [SPI]". Is the manuscript so old, or why do you use SSI?

Abstract:

1. Please describe the time course of BP and HR after the pinning in a little more detail. Focus on the issue of whether or not these parameters actually changed as a result of pinning.
Methods:

1. Though it appears that you did not include many very young children, you describe the method of induction of anaesthesia in this group. These kids (< 3 yrs.) apparently received atropine on induction! Atropine, as well as many other substances (i.e. phenylephrine, metaraminol, catecholamines, glycopyrrolate, etc.) are well known to significantly change heart rate variability (one of the underlying parameters in calculation of SPI). Hence, they MUST BE EXCLUDED! Please elaborate, if/how many patients received any of the above substances. These will need to be excluded!

2. Please describe in detail which sensor you used for the oxygen saturation assessment in these children. Did you measure on the fingers or toes? Only a measurement with a finger sensor would be validated for SPI calculation!!!! So please describe this detail in the methods.

3. I am not 100% sure whether I can follow the sample size calculation. Could you elaborate more on this? Its unusual for such a small sample size to achieve a power of 95% - are you sure about this? Why did you elect such a high power (vs. i.e. a more standard 80%)? Of note: its either the "University Kiel" or "Universitaet Kiel", not "Universitat Kiel".

4. Though you mention this in the discussion, but: could you please clearly describe how long the sufentanil infusions were running until the head pinning was performed? If the infusion was only started at the time of intubation, I would assume that only a few minutes passed until the surgeon would have liked to pin the head. This may not be sufficiently long to achieve a steady state in each group. Hence it could be that there was no difference for the sufentanil concentration between the groups. Please provide some pharmacokinetic modelling to indicate how long such infusion likely needed to run to assume a steady state. I understand that you did not test blood concentrations.....but one would need to know whether there was even a chance for differences to establish between the groups.

Results:

1. I note that the data is generally displayed as median (IQR)...but for comparison of the "reaction" to pinning ANOVA was used? I assume that the data did not follow normal distribution? Why did you not use a non-parametric test instead? Would the outcome have been different?

2. The table displaying the BP results should not have the P values in the actual table (better just * and P values in footnote). To me it looks very much as if the BP values at point 2
and 3 may have also been different to baseline. But no indication of this is provided. Were these indeed different?

3. The table with the HR results does lack any p values at all. In the text the authors describe some vague difference within the HR groups.....but it does not show. I would prefer if each table could have a footnote indicating i.e. "no differences found between time points and between sufentanil groups", or similar. Or indicate with a symbol in the table where significant difference were found.

4. I do not like the figure with the SPI values, as it lacks any idea about the distribution/spread of data. Could you not display this in a table similar to your HR and BP tables?

5. Ideally, I would like to see a result for SPI vs HR and BP (all suf. groups combined and for each single group L,M,H) indicating whether or not the parameters changes with head pinning?

Discussion:

I miss a discussion about whether or not SPI, HR and BP at all reacted to head pinning. Maybe its there....but its too vague for me to really understand this well. I would like to see this being discussed, and then, subsequently, whether or not inter-group differences were found.

To me it looks like there may have been no differences between the sufentanil groups for any parameter. The latter could be based on the fact that probably no differences in sufentanil were actually established (see my comment above).

Also, in relation to my comment about atropine et al.: you will need to discuss this issue.

Yours

Thomas Ledowski
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

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I declare that I have given 1 lecture (for which a honorarium was paid to my employer) for GE Healthcare, the makers of SPI. However, neither GE nor any other party had any influence on my assessment of this manuscript.

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