Reviewer’s report

Title: Ear and Forehead Temperature Has a Limited Prediction Value of Rectal Temperature in Children

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Reviewer: Edgar W. Delgado-Eckert

Reviewer’s report:

In the manuscript entitled „Ear and Forehead Temperature Has a Limited Prediction Value of Rectal Temperature in Children“ the authors present a study aimed at comparing the performance of two specific devices designed to measure ear and forehead temperature in children, respectively, with the gold standard, i.e., the rectal temperature, which is also measured with a specific device. This comparison has two aspects to it. 1) To determine the ability of temperature measurements conducted with these devices to serve as a proxy for the rectal temperature. 2) To evaluate the performance of these devices when it comes to detecting fever in children.

Based on the author's description, the study was properly conducted and a sufficiently large group of participants was recruited.

General comments:

I disagree when the authors state in their manuscript that "The ability of the non-rectal thermometers to predict the rectal temperature was examined". If the non-rectal temperature measurements are inserted into a properly calibrated model, a model that could, in principle, be derived from basic physical laws, then such non-rectal temperature measurements may very well predict the rectal temperature. However, this is not what the authors have done in their study. Rather, what the authors have done is to compare non-rectal temperature measurements with rectal temperature measurements, all of these performed with specific devices. This comparison was quantitatively carried out using a Bland-Altman analysis. My suggestion is that the authors change the wording throughout the manuscript. For instance, statements like "The forehead and ear temperature measurements were both poor predictors of the rectal temperature" should be changed to "The agreement between both forehead and ear temperature measurements and rectal temperature measurements is not good enough for clinical purposes" or something along those lines.

The authors conclude "we found that temporal measurements of temperature are not presently recommendable, but tympanic measurement performed by a modern device is useful for screening purposes". This statement is too vague and could be very misleading, because it is not clear at all what is meant with the wording "a modern device". What is a modern device? One that a physician can order online? Such a device might be designed using an older technology.
Consequently, it is very important that the authors find out what are the precise technologies used inside the devices they have utilized in their study to measure the various temperatures. As stated in the introduction "professional-grade infrared pre-warmed tip "; this goes in the right direction, should be a lot more specific though. The statements and conclusions of the manuscript should then be making reference to the specific technology used.

Specific comments:

In the Methods section the authors briefly describe how the minimal sizes of the different age groups were chosen, apparently via a power analysis. However, it is not clear how this power analysis was conducted. What assumptions about the distribution of temperature differences were made? Are these assumptions supported by the data? All these details should be included in the online Supplement of the manuscript.

In the Methods section the authors should be more specific about how the ROC curves were constructed. What threshold determines the classification boundary for calculating the points on the curve?

**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.

Yes

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