Reviewer’s report

Title: Effect of different assumptions for brain water content on absolute measures of cerebral oxygenation determined by frequency-domain near-infrared spectroscopy in preterm infants: an observational study

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Reviewer: Keith St Lawrence

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This study investigates the potential effects of variations in brain water content on StO2 measurements. Frequency-domain data were acquired from preterm infants and StO2 calculated using one of three brain water content values (75, 85 and 95%). Although, the error due to variations in water content appears to be fairly small, it is often ignored so it is useful to have a study that explores this potential source of error. As this is a very brief study with a singular focus, I have few comments. My only major one is that the authors should provide a better explanation of the potential impact of their findings. That is, what is the clinical impact of a 4% error? Because of a variety of issues, NIRS is often only used for relative StO2 monitoring over short periods of time. Monitoring over days or even weeks can be challenging due to errors associated with variations in probe placement and physical changes as the brain matures such as myelination and cortical folding. There have been previous studies looking at the reproducibility of NIRS and it would be easier to appreciate the important of variations in water content by a discussion of the overall variability of NIRS from previous clinical studies.

Minor Points:
1) Remove the word 'points' after all percentages. It’s redundant.

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

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