Cerebral oxygenation in hemodialysed patients

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To the Editor:

In a study by Matsukawa et al. [1] that aimed to assess the accuracy of near infrared spectroscopy (NIRS) in estimating cerebral oxygenation, it is crucial that the chosen measure of cerebral oxygenation be widely accepted as the gold standard. The authors chose jugular venous oxygen saturation (SjVO₂), which fulfils this criterion, but their method of sampling was unusual. Blood is typically sampled from the jugular bulb [2]. Here, the authors sampled blood from a single venipuncture at the internal jugular vein, which is much more distal and raises the possibility of extra-cerebral contamination. This substandard measurement of SjVO₂ casts doubt on the validity of the study conclusion.

The authors attempted to draw associations between the area of cerebrospinal fluid (CSF) layer and skull thickness (measured from CT scans of the brain) and rSO₂ values, but were unclear about the number of patients who had the scans performed.

It is difficult to ignore the potential sources of bias when 40 patients were excluded due to missing data and only 7 (23%) were included in one arm of the study. Differences in the baseline patient characteristics also raise concern.

Hemodialysis (HD) patients were significantly older than the non-HD patients, which could have accounted for the group's higher CSF layer area. The HD patients also had significantly lower mean arterial pressures and hemoglobin levels. All these confounders were not statistically adjusted for.

Due to these flaws and the absence of continuous monitoring of rSO₂ and SjVO₂, definite conclusions should be delayed until further prospective studies address these concerns.

References

1. Matsukawa S, Kai S, Mizota T. Near-infrared spectroscopy underestimates cerebral oxygenation in hemodialysis patients. *J Anesth*. 2019. <https://doi.org/10.1007/s00540-019-02650-4>.
2. Schell RM, Cole DJ. Cerebral monitoring: jugular venous oximetry. *Anesth Analg*. 2000;90:559–66.

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