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Letter to the Editor

Optic nerve sheath diameter measurement in hypoxic ischaemic brain injury after cardiac arrest

Sir,

We were very pleased to read about ocularultrasonography in the interesting paper by Cardim et al.[1], where they compared three non-invasive estimators of intracranial pressure to invasively one in post-cardiac arrest patients with hypoxic ischaemic brain injury.

We congratulate the authors for their remarkable study that emphasizes the utility of ultrasound in detecting intracranial hypertension, but we would like to make some comments on the method utilized to measure the optic nerve sheath diameter (ONSD).

For more than 50 years, ultrasound B scan technique has been employed to detect several ocular and orbital diseases. Unfortunately, it has been proven to be quite unreliable for the measurements of small structures such as ONSD, because of the so-called blooming effect.[2,3] This effect is due to the absence of a standard sensitivity setting in performing B scan and this signifies that, with a lower sensitivity setting, the ONSD will display larger measurements compared to the ones obtained with a higher sensitivity setting.

However, this effect could be negligible when large lesions need to be evaluated, but this will be very influent in case of lesions inferior to 0.5 mm, where also few microns could be significant, as for ONSD appraisal.

Due to the aforesaid limits, in case of future studies, we would like to recommend utilizing the Standardized A Scan. This ecographic technique, which is blooming effect free, displays easily noticeable hyperreflective spikes from the interface between arachnoid and subarachnoidal fluid, making these measurements objective and more accurate. For this reason, A scan ultrasound method permits more precise reference range values, that can be considered universal.[4] Moreover, we would like to highlight that ONSD increase does not necessarily mean intracranial hypertension, but it could also be present in case of optic neuritis, optic nerve meningioma or leukemic infiltration of the optic nerve. To demonstrate the actual presence of intracranial hypertension, a “30 degree test” can be performed with A scan. This test consists in measuring the ONSD with the patient looking straight, followed by a measurement with the patient looking laterally. Raised intracranial pressure, caused by increased subarachnoidal fluid, will be proved if there is a decrease in the maximal ONSD of at least 5% with this test, excluding in this way the presence of the above-mentioned optic nerve diseases.[5]

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Conflict of interest

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