

Results: A total of 40 brain dead patients were studied (median age 72 IQR[55-79], 35% intracranial hemorrhage, 35% traumatic brain injury, 15% ischemic stroke, 7% hypoxic brain injury post-cardiac arrest, 3% subarachnoid hemorrhage from brain aneurysm rupture, 5% others). Among them, despite the presence of clinical, neurophysiological and neuroradiological criteria of brain death (assessed with brainstem reflexes, electroencephalography, and CT angiography), we recorded a median rSO₂ value of 72% (IQR [63-75]). The 90% of the total series (36/40) have experienced a normal rSO₂ values (i.e., rSO₂ >50%) and only 10 % (4 patients) showed rSO₂ values below 50%, among whom two patients presented concomitant severe cardiac dysfunction. A left-sided decompressive craniectomy was performed in two patients, in which we observed the left rSO₂ value much higher than contralateral (i.e., both with delta rSO₂>20). Moreover linear correlation was found between rSO₂ and SaO₂ ($r = -0,393$; $p < 0,02$).

Conclusion: In the experimental model of global brain ischemia such as brain death, the current NIRS technology does not mirror the real state of the brain oxygenation; indeed a normal rSO₂ values were found in our analysis (72%, IQR[63-75]) These data sustain the low sensitivity of the NIRS monitoring in measure faithfully the correct oxygenation status beyond the forehead[5, 6]. More studies are needed to better understand the limits and reliability of NIRS algorithms in detecting brain ischemia.

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7. The author declares that the research was conducted in the absence of any commercial or financial founding, excluding a potential conflict of interest.

000959

Acquiring competencies in cerebral ultrasonography: a pragmatic study

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Introduction: Echography is becoming a diffuse, economic and non-invasive tool used in general ICU (Intensive care unit) while is less utilized for exploring the brain, protected by the skull. However, it could have multiple applications in the study of cerebral vessels anatomy

and from its important role in the diagnosis of acute intracranial pathologies (1). Skills to be acquired have been recently described in a Consensus (2). No information about the utility of practical training are available.

Objectives: The aim of this project is to evaluate the improvement in the use of ultrasonography and TCCD (transcranial colour-coded duplex) diagnostic methods after a dedicated training course.

Methods: In December 2019, 31 participants (3 intensivists and 28 residents) naive to the technique attended for two days the SONIC (Sonography in Neuro-Intensive Care) theoretical-practical course at University of Piemonte Orientale. Specialists in this field described the use of ultrasonography and TCCD in a large spectrum of clinical conditions, followed by practical hands-on sessions on volunteers and in ICU.

Before and after the training, all participants answered to a 51 multiple-choice online questionnaire and were required to evaluate a set of brain echographic images. A paired t-test was applied to evaluate the improvement.

Results: The median score obtained in the multiple-choice question was respectively 27 (pre) and 36 (post).

The paired t-test applied, showed a significant difference between the mean performance scores pre and post training course ($p < 0.001$). The mean difference, between pre and post scores, was equal to 10.19 points (95% confidence interval = 7.95-12.43).

The median score obtained in the images' evaluation was 4 (maximum score of 5).

Conclusion: The analysis conducted on the scores obtained before and after the theoretical-practical course showed how useful could be a targeted approach to the correct use of TCD ultrasonography improving personal skills about it.

According to the Consensus (2) we could consider an upgrade of the participants' level to basic-plus/pre-advance.

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000969

Brain Oxygen Tension Over the First 24 Hours of Monitoring, Predicts Intensive Care Survival in Adult Patients with Traumatic Brain Injury

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Introduction: Optimal management and monitoring of traumatic brain injury (TBI) remains uncertain. Intracranial pressure (ICP) monitoring lacks high quality evidence and does not prevent cerebral hypoxia (Stiefel *et al.*, 2006; Carney *et al.*, 2017). Robust evidence for the use of brain oxygen tension (PbtO₂) monitoring is also lacking, but preliminary work is promising and suggests it may improve outcomes. In a prior study, we found that early PbtO₂ improvement, or low hypoxic load over the first 24 hours, were associated with ICU survival (Rhodes, Chandrasekaran and Andrews, 2016).

Objectives: In a second independent cohort of patients with moderate to severe TBI, to validate the observation that exceedingly early changes in PbtO₂ are associated with ICU survival.

Methods: A retrospective analysis was performed on prospectively collected data from a cohort of 60 TBI patients at a single centre focusing on the first 24 hours of monitoring. Minute-to-minute ICP, cerebral