deterioration in such patients, as an early indicator of brain-heart network dysfunction.

Objectives: We examined the changes in HRV measured by electrocardiography (ECG) in patients who experienced neurological deterioration after severe acute brain injuries, and analyzed the correlation between HRV and the qualitative and quantitative variables of electroencephalography (EEG).

Methods: Thirteen EEG channels and one channel of simultaneously-acquired ECG were segmented in 120 s epochs and used to calculate ten HRV features (standard deviation of the normal-normal intervals, root mean square of the difference in successive intervals, very low frequency power, low frequency power, high frequency power, low frequency/high frequency power ratio, SD along the transverse axis of the Poincaré plot [SD1], SD along the longitudinal axis of the Poincaré plot [SD2], SD2/SD1 ratio, and approximate entropy) and three quantitative EEG features (suppression ratio, asymmetry index, and alpha/delta band power ratio). Raw EEGs of epochs were also reviewed using standardized terminology and graded according to its background activities and ictal-interictal continuum patterns.

Results: The neurophysiological features of 25 patients with severe acute brain injury due to various causes were analyzed. The HRV and EEG features showed progressive and significant changes in the 48-hour period prior to neurological deterioration. Notably, the suppression ratio and background severity grade of the EEG showed significantly negative correlations with all HRV features.

Conclusion: Integration of HRV monitoring with continuous EEG monitoring may enable timely identification of progressive secondary brain injury before the development of irreversible injury.

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000501

Intracranial pressure management in acute brain-injured patients: baseline characteristics of the Synapse-ICU Centers

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Intensive Care Medicine Experimental 2020, **8(2)**: 000501

Introduction: Increased intracranial pressure (ICP) is one of the major clinical complications of acute brain injuries (ABIs) and correlates with poor outcome. ICP monitoring (ICPm) is the most common neuromonitoring modality used in intensive care units (ICUs). However, no evidence-based recommendations on ICP management are present in the current literature. Practice about indications of ICPm is variable in high- (HICs) and in low-middle-income countries (LMICs), where data is scarce or inconsistent.

Objectives: Aim is to quantify practice variations in ICPm in HICs and LMICs and in TBI and non-TBI patients.

Methods: The SYNAPSE-ICU is a prospective, observational, international cohort study (NCT03257904) focused on describe the current practice of ICPm using a worldwide sample. Centre Data Characteristics Form has been submitted to each center enrolled in the study to assess the standard intensive care practice in ABI patients. Information about the institution and ICP monitoring and management were indicated.

Results: Worldwide, 156 sites distributed in 41 countries participated in the study. The Center Form was completed by 97.4% of sites. Based on World Bank List of Economies Classification (2019-2020), 110 (72.4%) of centers were localized in HICs and 42 (27.6%) in LMICs. Over two thirds of the centers have an academic affiliation (69.7%). A specialist neurocritical ICU was available in 31.6% of centers, whereas in the majority of them (68.4%) ABI patientswere admitted to other ICUs (mixed, surgical, medical). In 99.3% of sites patients were monitored 24/7 by medical staff, and the most represented nurse:patient ratio was 1:2 (54.0%).

Overall, 72.4% of centers routinely used ICPm in TBI patients, and approximately half of them routinely monitored ICP in SAH and ICH. A protocol/policy for ICP treatment in TBI, SAH and ICH was available in 63.8%, 49.3% and 48.0% of centers, respectively.

Regarding the availability of neuromonitoring devices, 95.4% of ICUs declared to have an intracranial catheter to monitor ICP. At least one additional non-invasive neuromonitoring technique (transcranial doppler, optic nerve sheath diameter ultrasound, EEG, pupillometry and NIRS) was available in most of centers both in HICs (91.8%) and in LMICs (90.5%), whereas an additional invasive neuromonitoring device (brain tissue oxygen and temperature, cerebral microdialysis, regional cerebral blood flow, deep/cortical EEG electrodes) was usable in 49.1% of HIC and in 26.2% of LMIC centers.

Neuroimaging modality most frequently used was CT scan (98.6% of ICUs), while an advanced technique (MRI, CT angiography, CT perfusion, and PET) was available in 59.3% of centers.

Conclusion: A great center variability in ICPm of ABI patients was observed worldwide. The results stress the need of evidence-based recommendations regarding ICPm, in particular in LMICs, where resource limitation may preclude ICPm utilization.

Reference(s) and grant ackowledgment(s)

1. The study received an award from the ESICM, and it is inserted in the ESICM research portfolio.

000682

Near-infrared spectroscopy in brain dead neurocritical care patients

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Intensive Care Medicine Experimental 2020, **8(2)**: 000682

Introduction: Does near-infrared spectroscopy (NIRS) is a reliable index of brain oxygenation? NIRS is generally used as a non-invasive tool to assess regional cerebral oxygen saturation (rSO2) to prevent ischemic brain damage. Albeit its use is widespread in the neurocritical care field[1], its real role in accurately detect ischemic insults and low cerebral flow is still a matter of debate mainly because of a lack of information on the NIRS algorithm utilized by each manufacturer and the low-resolution depth of the elliptical path of the optical spectrophotometry [2–4,6].

Objectives: Our purpose is to detect the cerebral oxygen saturation of the forehead in a clinical model of a diffuse ischemic brain injury, such as brain-dead patients.

Methods: We retrospectively analyzed adult neurocritical care patients who evolved into brain death between January 2019 and March 2020. NIRS was sampled with the O3™ (Masimo, Irvine, CA) and SensmartTM X-100 (Nonin Medical, Inc., Plymouth, Minnesota, US) system for the total duration of 20 minutes after the patient had been declared brain dead, according to the Italian national criteria/guidelines.