

Moving Forward: The Role of Neuromonitoring in Pediatric Traumatic Brain Injury and Targeted Therapy

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Editorial

Traumatic brain injury is a major cause of morbidity and mortality in the developed country. The main purpose of patients care in the intensive care unit is to prevent development of secondary brain injury and its treatment. The neuroprotection comprising of several strategies constitute the backbone of management including maintenance of adequate cerebral perfusion pressure sufficient to meet the metabolic demands for oxygen and glucose [1]. Traumatic brain injury is also a leading cause of death in children. Neurointensive pediatric management is currently in its infancy unlike well-developed research based supporting understanding in adult population. The adult based application protocol using targeted therapy for monitoring and control of intracranial pressure (ICP) based on cerebral perfusion pressure (CPP) does not totally prevent the development of cerebral hypoxia or ischemic injury [2,3].

The intracranial pressure control provides a way to control the secondary injury. The rise of ICP increases risk of secondary brain injury by affecting cerebral blood flow, which leads to tissue ischemia. The duration of the sustained rise of the ICP is directly related to the subsequent worse neurological prognosis of TBI, however, not all cases with intracranial hypertension has a poor prognosis, as this is highly relevant in the pediatric population as it shows ICP and CPP monitoring are not the sole determinant of prognostic outcome puzzle game [4].

Brain tissue oxygen stress (PbtO₂) monitoring can be a useful alternative, but currently there is only one level III recommendation to maintain PbtO₂>10 mm Hg. On the other hand the Jugular venous saturation monitoring (SjvO₂) helps us measuring the balance between the cerebral oxygen supply and demand. The evaluation of SjvO₂ technique is remarkably useful but real limitation is lack of existence of management- protocols for optimal implementation in the pediatric age-group [5,6].

Cerebral Microdialysis, Transcranial Doppler Ultrasonography are also used in centers worldwide for continuous monitoring, however

the microdialysis failed to demonstrated benefit specially in the pediatric traumatic brain injury, Transcranial doppler will be useful for evaluation of cerebral vascular autoregulation, but more detailed research evaluation is necessary prior to conclude typical role of the alteration of cerebro-vascular auto-regulation as independent poor neurological prognosis factor in infants [7-9].

The neuromonitoring in TBI has its advantages and limitations. The complex data acquired during the use of these techniques in the of pediatric traumatic brain injury management can aid to improve the neurological outcome. In the recent future, integration of various modes of neuromonitoring will be method of choice in the pediatric traumatic brain injury configured to set a new trend of personalized management.

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