Korean J Neurotrauma. 2023 Jun;19(2):126-127
https://doi.org/10.13004/kjnt.2023.19.e23
pISSN 2234-8999·eISSN 2288-2243

KJNT

Editorial

Neurocritical Care and Neurotrauma

Eun Jin Ha [1] **and Jiwoong Oh** [2]

[1]Department of Critical Care Medicine, Seoul National University Hospital, Seoul, Korea
[2]Department of Neurological Surgery and Critical Care Medicine, Severance Hospital, Yonsei University College of Medicine, Seoul, Korea

Received: Jun 5, 2023
Accepted: Jun 8, 2023
Published online: Jun 19, 2023

Address for correspondence:
Jiwoong Oh
Department of Neurological Surgery and Critical Care Medicine, Severance Hospital, Yonsei University College of Medicine, 50-1 Yonsei-ro, Seodaemun-gu, Seoul 03722, Korea.
Email: worldcapture@hanmail.net

ORCID iDs
Eun Jin Ha
https://orcid.org/0000-0003-3278-0550
Jiwoong Oh
https://orcid.org/0000-0001-6065-4821

Conflict of Interest
The authors have no financial conflicts of interest.

Severe neurotrauma with blunt or penetrating brain injuries has been a worldwide issue concerning high morbidity and mortality for decades. Patients with serious neurotrauma fundamentally require a well-established series of intensive care for a good recovery. The fields of neurocritical care have rigorously been evolved to meet the unique needs of these patients.

In the past, the neurocritical care was primarily focused on the supportive measures to manage the increased intracranial pressure (ICP), disturbed cerebral blood flow, and insufficient oxygenation due to defective cerebral perfusion. The primary goal was to prevent the secondary brain injury as well as to maintain the adequate cerebral perfusion. Over the recent few years, the area of neurocritical care has expanded to include the advanced monitoring techniques and interventions which can improve the outcomes of patients with severe neurotrauma.

One of major advances in the neurocritical fields is the use of neuromonitoring tools in order to continuously measure the ICP, cerebral blood flow, and other physiological parameters. This allows the neurosurgeons to detect early clinical changes in the patients' conditions so that they can promptly intervene at the right time to prevent the secondary consequences of brain injuries.

Another exclusive area of neurocritical care is the use of targeted temperature management. This high-end intervention is applied to control the afflicted patient's body temperature, and subsequently to reduce the further brain damage induced by neuro-inflammation. Numerous studies have demonstrated that this "thermo-critical" care in the neurosurgical patients with severe traumatic brain injuries (TBIs) has many potentials for the clinical applications.

In addition to the above interventions, the neuro-intensivists have strived to develop the personalized treatment plans the for patients with severe neurotrauma. This involves the efforts to tailor the treatment plan to meet the individual patient's needs based on the clinical factors such as severity of the injury, age, and overall health and medical conditions, and presence of comorbidities.

There is also a growing interest in the use of advanced imaging techniques and biomarkers to better understand the underlying mechanisms of severe neurotrauma. This will eventually help to identify the patients who may benefit from specific treatments. The use of artificial

intelligence and machine learning algorithms is also being actively explored to predict the prognosis of the patients to personalize the treatment plans.

Yet, the fields of neurocritical care in the TBI still have a long to go in Republic of Korea (ROK). For instance, only 8.7% of the patients with severe TBI were reported to receive ICP monitoring in ROK according to the Korean Neurotrauma Databank. Moreover, 70%–90% of the Korean neurosurgeons are rather skeptical and negative about the use of ICP monitoring in the patients with TBI. There are urgent needs for the active use of ICP monitoring in the neurocritical patients. Not only the ICP monitoring but also many other advanced monitoring systems, which are intensively applied in the overseas, have not been introduced yet in ROK. The fields of neurocritical care in the TBI are still regressed in ROK where the general management is not following the international trends all the time.

In conclusion, the field of neurocritical care has come a long way to manage severe neurotrauma and will continue to evolve with the advances in technology and research. The use of neuromonitoring, targeted temperature management, and personalized treatment plans have improved the outcomes of the patients with severe neurotrauma. Future advances in the imaging tools and the applications of biomarkers will promise for further improving care for these patients. Neurocritical care is a mandatory field in the TBI management. It is the Korean neurosurgeons' unavoidable duty to be academically up to date into developing the advanced neuro-monitoring system and into upgrading the neuro-intensive management. By doing so, we can arise up to the global standards for the provision of neurosurgical patient care with better quality.

https://doi.org/10.13004/kjnt.2023.19.e23