

Traumatic brain injury in children: Acute management and rehabilitation.

Keith Turner*

Department of Movement Sciences, KU Leuven, Belgium

Introduction

Traumatic brain injury (TBI) in children is a significant concern due to the potential for lasting impacts on their development and overall quality of life. TBI can result from various incidents, such as falls, accidents, or sports injuries, and the management of these injuries involves both acute care and long-term rehabilitation. Understanding the complexities of acute management and rehabilitation is essential for optimizing outcomes and supporting recovery in affected children [1].

Acute management of TBI in children begins with a thorough assessment in the emergency setting. The primary goal is to stabilize the child and prevent further injury. Initial evaluation often involves a detailed history and physical examination, focusing on the mechanism of injury, the child's level of consciousness, and any symptoms such as headache, vomiting, or confusion. The Glasgow Coma Scale (GCS) is commonly used to assess the severity of consciousness impairment, with scores ranging from mild to severe based on the child's responsiveness [2].

Imaging studies, such as computed tomography (CT) scans or magnetic resonance imaging (MRI), are critical in diagnosing the extent and type of brain injury. CT scans are often the first choice in the acute setting due to their rapid availability and effectiveness in detecting hemorrhages, contusions, or skull fractures. MRI may be used for a more detailed assessment, particularly if there are concerns about diffuse axonal injury or subtle brain abnormalities [3].

Management in the acute phase focuses on ensuring adequate cerebral perfusion and preventing secondary brain injury. This involves monitoring and maintaining optimal levels of oxygenation, blood pressure, and intracranial pressure (ICP). Elevated ICP, which can occur due to swelling or bleeding, may require interventions such as hyperosmolar therapy with medications like mannitol or hypertonic saline, or surgical interventions like decompressive craniectomy in severe cases [4].

Supportive care is also crucial in the acute phase. Children with TBI may require ventilation support, intravenous fluids, and medications to manage pain and prevent seizures. Coordination with neurosurgical teams is often necessary for children with more severe injuries or those requiring surgical interventions [5].

Once the child is stabilized, the focus shifts to rehabilitation, which is essential for promoting recovery and addressing any functional impairments resulting from the injury. Rehabilitation typically involves a multidisciplinary team, including physiotherapists, occupational therapists, speech and language therapists, neuropsychologists, and social workers, who work together to address the child's diverse needs [6].

Rehabilitation begins with early mobilization and physical therapy. The goals are to improve motor function, strength, and coordination. For children with motor impairments, therapists develop individualized exercise programs to enhance movement abilities and prevent complications such as muscle contractures or joint stiffness. Therapy often includes activities to improve balance, gait, and overall physical endurance [7].

Occupational therapy focuses on helping children regain the skills necessary for daily living and self-care. This includes tasks such as dressing, feeding, and grooming. Therapists work on fine motor skills, hand-eye coordination, and cognitive abilities to support the child's independence and participation in everyday activities. Adaptive techniques and assistive devices may be introduced to facilitate these skills [8].

Speech and language therapy is vital for children who experience difficulties with communication or swallowing. Speech therapists address issues related to articulation, language comprehension, and expression. They also work with children who have problems with swallowing, which can be a concern following a TBI. Therapy may include exercises to strengthen the muscles involved in speech and swallowing, as well as strategies to improve communication [9].

Cognitive and neuropsychological rehabilitation is important for addressing any cognitive deficits resulting from the injury. This may involve working on attention, memory, problem-solving, and executive function skills. Neuropsychologists assess cognitive functioning and develop strategies to support the child's learning and behavioral needs. Educational support, including individualized education plans (IEPs) or 504 plans, may be necessary to accommodate cognitive impairments in the school setting [10].

Conclusion

Managing traumatic brain injury in children involves a two-phase approach: acute management and rehabilitation. Acute

*Correspondence to: Keith Turner, Department of Movement Sciences, KU Leuven, Belgium. E-mail: keith@ku.bl.co

Received: 25-Jun-2024, Manuscript No. JNNR-24-144119; Editor assigned: 26-Jun-2024, Pre QC No. JNNR-24-144119(PQ); Reviewed: 10-Jul-2024, QC No. JNNR-24-144119; Revised: 15-Jul-2024, Manuscript No. JNNR-24-144119(R); Published: 23-Jul-2024, DOI: 10.35841/ajjnr-9.4.214

care focuses on stabilizing the child and preventing secondary injury, while rehabilitation aims to address functional impairments and support overall recovery. A multidisciplinary approach, including physical, occupational, and speech therapies, along with psychological support, is essential for optimizing outcomes and supporting the child's development and quality of life. Ongoing research and advances in treatment strategies hold promise for further improving care and recovery for children affected by TBI.

References

1. Williams K, Wainwright MS. Pathophysiology and management of moderate and severe traumatic brain injury in children. *J Child Neurol.* 2016;31(1):35-45.
2. Tepas III JJ, Leaphart CL, Pieper P, et al. The effect of delay in rehabilitation on outcome of severe traumatic brain injury. *J Pediatr Surg.* 2009;44(2):368-72.
3. Catroppa C, Anderson V. Traumatic brain injury in childhood: rehabilitation considerations. *Dev Neurorehabil.* 2009;12(1):53-61.
4. Tal G, Tirosh E. Rehabilitation of children with traumatic brain injury: a critical review. *Pediatr Neurol.* 2013;48(6):424-31.
5. Brain TR. Rehabilitation of persons with traumatic brain injury. *Jama.* 1999;282(10):974-83.
6. Jaffe KM, Massagli TL, Martin KM, et al. Pediatric traumatic brain injury: acute and rehabilitation costs. *Arch Phys Med Rehabil.* 1993;74(7):681-6.
7. Massagli TL, Jaffe KM. Pediatric traumatic brain injury: prognosis and rehabilitation. *Pediatric Annals.* 1994;23(1):29-36.
8. Whitaker-Lea WA, Valadka AB. Acute management of moderate-severe traumatic brain injury. *Phys Med Rehabil Clin N Am.* 2017;28(2):227-43.
9. Iaccarino MA, Bhatnagar S, Zafonte R. Rehabilitation after traumatic brain injury. *Handb. Clin. Neurol.* 2015;127:411-22.
10. Cantore L, Norwood K, Patrick P. Medical aspects of pediatric rehabilitation after moderate to severe traumatic brain injury. *NeuroRehabilitation.* 2012;30(3):225-34.