LETTER TO THE EDITOR

Can the choice of resuscitation fluid in a patient with traumatic brain injury affect the outcome?

Umar Nadeem[1], Sobia Sarwar[2], Bilal Ahmad[3]

Madam, Traumatic brain injury (TBI) refers to non-congenital, non-degenerative damage to the brain caused by an external mechanical force which can lead to permanent or temporary impairment of cognitive, psychosocial, and physical functions, accompanied by a reduced or altered state of consciousness.[1] TBI is the most frequently occurring among common neurological disorders and accounts for a significant public health challenge.[2] TBI has a high prevalence worldwide in adolescent (15 to 18 years) and elderly (>65 years) groups with a reported incidence of 1.7 million cases in the US alone.[3] Pakistan also has a high prevalence of TBI with approximately one-third of its population being affected by it mainly due to the high incidence of road traffic accidents.[4]

Patients with TBI often present with clinical features of shock especially when the mechanism of injury is associated with high-energy trauma like road traffic accidents. In such cases, there is an imminent need for fluid resuscitation which becomes more important in under-served areas where immediate neurosurgical care is not available. It is widely known that crystalloids are superior to colloids for the resuscitation of the patient in such settings.[5] The ringer lactate solution is usually preferred over normal saline for resuscitation in non-TBI settings because of lower mortality but the same is not true in TBI settings in which normal saline has been reported with significantly lower mortality. This difference can be attributed to the fact that ringer lactate being a balanced crystalloid, is hypo-osmotic, and thus can increase the intracranial pressure as well as the incidence of hyponatraemia in patients with TBI.[6] Therefore, in TBI, normal saline should be the fluid of choice for resuscitation instead of ringer lactate solution.

[1]Department of Neurosurgery, King Edward Medical University, Lahore, Pakistan; [2]Department of Neurology, Independent Medical College, Faisalabad, Pakistan; [3]3rd Year MBBS Student, Shaikh Khalifa Bin Zayed Al Nahyan Medical and Dental College, Lahore, Pakistan.

Correspondence: Umar Nadeem. Email: ominadeem@gmail.com

ORCID ID. 0009-0001-8468-2605

The choice of fluid for resuscitation is of paramount importance in TBI, especially in a country like Pakistan where advanced healthcare facilities for neurosurgical care are not available in every city and village. Hence, many patients get referred to tertiary care centers from primary and secondary care centers after initial resuscitation for further management. In such cases, the correct choice of resuscitation fluid can significantly help in improving the odds of survival till patient's arrival at higher care facility, and thereby help in decreasing the overall mortality associated with TBI.

Disclaimer: None.

Conflict of interest: None.

Funding disclosure: None.

DOI: https://doi.org/10.47391/JPMA.10032

Submission completion date: 07-06-2023

Acceptance date: 17-07-2023

References

1. Segun Toyin Dawodu J. Traumatic brain injury (TBI) - definition, epidemiology, pathophysiology. [Online] 2021 [Cited 2023 May 22]. Available from: URL: https://emedicine.medscape.com/article/326510-overview
2. Maas AIR, Menon DK, Manley GT, Abrams M, Åkerlund C, Andelic N, et al; InTBIR Participants and Investigators. Traumatic brain injury: progress and challenges in prevention, clinical care, and research. Lancet Neurol 2022; 21: 1004-60.
3. Georges A, M Das J. Traumatic Brain Injury. In: StatPearls. Treasure Island (FL): StatPearls Publishing. [Online] 2023 [Cited 2023 Jan 15]. Available from: URL: https://www.ncbi.nlm.nih.gov/books/NBK459300/
4. Bhatti J, Stevens K, Mir M, Hyder AA, Razzak J. Emergency care of traumatic brain injuries in Pakistan: a multicenter study. BMC Emerg Med 2015; 15 Suppl 2: S12.
5. Ramesh GH, Uma JC, Farhath S. Fluid resuscitation in trauma: what are the best strategies and fluids? Int J Emerg Med 2019; 12: 38.
6. Dong WH, Yan WQ, Song X, Zhou WQ, Chen Z. Fluid resuscitation with balanced crystalloids versus normal saline in critically ill patients: a systematic review and meta-analysis. Scand J Trauma Resusc Emerg Med 2022; 30: 28.