Letter To The Editor

Acute Rehabilitation in Traumatic Brain Injury

Muhammad Hafiz Hanafi

Department of Neurosciences, School of Medical Sciences, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia

Center for Neuroscience Services and Research, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia

Submitted: 23 Jan 2017
Accepted: 16 Apr 2017
Online: 30 Jun 2017

To cite this article: Hanafi MH. Acute rehabilitation in traumatic brain injury. *Malays J Med Sci.* 2017;**24(3)**:101–103. https://doi.org/10.21315/mjms2017.24.3.13

To link to this article: https://doi.org/10.21315/mjms2017.24.3.13

Sir,

The main aims during acute rehabilitation management for traumatic brain injury focus mainly on cognitive rehabilitation and complications prevention. Early assessment and intervention can improve patients' ability to return to their previous level of function and quality of life (1).

Every patient with mild, traumatic brain injury should be screened for functional deficits and daily living activities, including bowel and bladder continence, speech and swallowing, motor control, sensory impairment, language comprehension and production, cognition and potential psychiatric and medical comorbidities (2). Any impairment or disability noted should be addressed accordingly.

Ideally, all patients with moderate to severe traumatic brain injury should be referred to a rehabilitation team, including a rehabilitation medicine specialist, a neuropsychologist, an occupational therapist and a speech therapist to evaluate patients' cognitive functioning (2). Acute management of cognition, in moderate to severe traumatic brain injury, is based on the patient's respective Rancho Los Amigos Level of Cognitive Functioning.

The Rancho Los Amigos (RLA) Scale of Cognitive Functioning is a medical scale used to measure and identify the recovery pattern of the cognitive level and behavioral changes observed in patients with traumatic brain injury. It is a descriptive scale, and it does not require specific training in its use (3). It has adequate to excellent inter-rater reliability (3). Its utilisation is recommended in acute care of traumatic brain injury by the Traumatic Brain injury Taskforce (4).

The first three levels of RLA are known as disorders of consciousness, including the comatose state (RLA Level I), vegetative state (VS) (RLA Level II) and minimally conscious state (MCS) (RLA Level III). Assessment of patients during this period is done using the 2012 Coma Recovery Scale-Revised (CRS-R 2012) (1).

CRS-R 2012 is a medical scale for the disorder of consciousness, which includes 23 items with 6 subscales, including auditory, visual, motor, oromotor, communication and arousal functions. This scale differentiates the patient's recovery stage, whether he or she is in the comatose state, vegetative state, minimally conscious state or is emerging from the minimally conscious state. The CRS-R 2012 does not require specific training, and it has excellent test-retest reliability and interrater and intrarater reliability (5).

A systematic review, which identified one randomised control trial (RCT) (n = 14) and two controlled clinical trials (n = 54), concluded that, for the multisensory stimulation of patients in the comatose or vegetative states, the results were invalid and, therefore, no clinical outcomes or practice recommendations could be made, due to the methodological and statistical limitations of all three studies (6). Novel treatment for disordered consciousness in traumatic brain injury patients includes hyperbaric oxygen, deep thalamic stimulation and transcranial magnetic stimulation (4).

There is insufficient evidence in the use of pharmacology agents to improve disordered consciousness; however, these agents may be used to optimise cognitive recovery for traumatic brain injury patients (7). A systematic review evaluated pharmacological interventions for patients in the vegetative or minimally conscious states, revealing some supporting evidence for the use of dopaminergic agents, amantadine and levodopa (n = 6), hypnotic agent zolpidem (n = 21) and intrathecal baclofen for spasticity (n = 5), in improving consciousness levels for a very small number of patients. Considerable limitations were noted within this literature, as it included a case series, a lack of cohort (or blinded), controlled study designs and considerable heterogeneity regarding patient characteristics (7).

Another systematic review of large, retrospective studies (n = 209) suggested that amantadine might improve cognition, arousal and other behavioural or functional responses following traumatic brain injury; however, the authors also suggested that additional, prospective, controlled studies are required (8). An amantadine dosage of 200 mg–400 mg can be used safely in even severe traumatic brain injury, and it may facilitate faster behavior and conscious level improvement (9).

Other awakening agents have been investigated, including bromocriptine, methylphenidate, levodopa and amitryptaline. However, considerable methodological issues, as well as the heterogeneity of outcome measures, have led to conflicting results between various studies (1).

Patients within RLA Levels IV and V display alertness, but are still in the confused stage. They do not require a lot of stimulation (from sound, light or smell), as this will further increase their agitation. Brief, quiet visits from familiar faces are the most helpful type of stimulation.

Any medical, remediable causes that can cause agitation should be addressed, including pain from the injury site, infection, thrombosis, sleep disorders, constipation or medication that may affect cognition and alertness (1). Family members, carers and nursing staff should be educated on the appropriate management of agitation and stimuli to the patient (1).

Agitation in RLA Level IV patients should be addressed properly. A systematic review, including six randomised control trials, evaluated the effectiveness of propranolol and pindolol, methylphenidate or amantadine in managing post-traumatic agitation (7). There was some evidence that the beta-blockers, propranolol and pindolol, can reduce aggressive behavior. However, the authors concluded that there was insufficient evidence on which to base firm recommendations regarding the use of these treatments, although beta-blockers had the best evidence for efficacy.

Any pharmacological treatments for traumatic brain injury should be individually tailored and commenced at the initial, minimum dosage in order to reduce the risk of possible, adverse effects (1).

Patients in RLA Level VI and above are ready to be independent in self-care and daily living activities. These patients should be trained and guided in inpatient or outpatient rehabilitation center in preparation for their return to their studies, driving and mobility or their return to work.

Family members and caregivers should be given training on patient care during the patient's hospital stay and before the patient returns to the community (5). Optimum preparation for family members and caregivers should include the following topics (5):

i. Assessment of a safe discharge environment, including available support.
ii. Equipment prescription and adaptation to optimise patient care.
iii. Training for family members and caregivers in the use of equipment and in patient management for daily and emergency situations.
iv. Education for the family members and caregivers regarding formal and informal resources, support groups and how to access them.

Correspondence

Dr Muhammad Hafiz bin Hanafi
NeuroRehabilitation Medicine Specialist,
Department of Neurosciences,
School of Medical Sciences,
Universiti Sains Malaysia,
16150 Kubang Kerian,
Kelantan, Malaysia.
Tel: +609 7676300
E-mail: drmdhafiz@outlook.com

References

1. Scottish Intercollegiate Guidelines Network (SIGN). *Brain injury rehabilitation in adults*. A national clinical guideline. Edinburgh, Scotland: SIGN; 2013(130).

2. Rehabilitation Reference Centre CINAHL Clinical Review. Traumatic brain injury: Rancho los amigos levels I, II, III. 2017. Retrieved March 27, 2017, from http://ezproxy.usm.my:3755/rcc/pdf?sid=714cfs

3. Rehabilitation Measures Database. Rancho levels of cognitive functioning. 2015. Retrieved December 16, 2015 from http://rehabmeasures.org/Lists/RehabMeasures/DispForm.aspx?ID=1066

4. TBI EDGE Task Force. TBIEDGE recommendations. 2017. Retrieved January 23, 2017 from http://www.neuropt.org/docs/tbi-edge/tbi-edge-neuro-section-full-edge-documents.pdf?sfvrsn=2

5. Acquired Brain Injury Knowledge Update Strategy (ABIKUS) guideline development group. ABIKUS evidence based recommendations for rehabilitation of moderate to severe acquired brain injury. 2007. Toronto, ON. Retrieved December 31, 2016, from http://www.abiebr.com/abikus

6. Fleminger S, Greenwood RRJ, Oliver DL. Pharmacological management for agitation and aggression in people with acquired brain injury. *Cochrane Database of Systematic Reviews*. 2006;**(4)**:1–30. https://doi.org/10.1002/14651858.cd003299.pub2

7. Talsky A, Pacione LR, Shaw T, Wasserman L, Lenny A, Verma A, et al. Pharmacological interventions for traumatic brain injury. *BC Med J*. 2010;**53(1)**:26–31.

8. Georgiopoulos M, Katsakiori P, Kefalopoulou Z, Ellul J, Chroni E, Constantoyannis C. Vegetative state and minimally conscious state: a review of the therapeutic interventions. *Stereotact Funct Neurosurg*. 2010;**88(4)**:199–207. https://doi.org/10.1159/000314354

9. Giacino JT, Whyte J, Bagiella E, Kalmar K, Childs N, Khademi A, et al. Placebo-controlled trial of amantadine for severe traumatic brain injury. *N Engl J Med*. 2012;**366(9)**: 819–826. https://doi.org/10.1056/NEJMoa1102609