



Editorial

The importance of early rehabilitation in traumatic brain injury

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Traumatic brain injury (TBI) refers to any kinds of injury that result from an external force whether in the structure of the brain or as a disorder in the physiology and function of the brain. Following this injury, some symptoms may occur such as a period of loss or reduction of consciousness, memory loss, changes in the patient's mental state at the time of injury and neurological deficits (1).

Traumatic brain injury, known as a silent epidemic, is considered as one of the leading causes of injury and disability and is a major health-related concern worldwide (2, 3). It is also one of the prominent causes of disability and death among young people in high-income countries. As a result of the use of motor vehicles in low- and middle-income countries, the occurrence of traumatic brain injury has increased (4).

According to the World Health Organization (WHO), road traffic accidents are considered as the third leading cause of illness and injuries (5). Although there is limited detailed information on the economic impact of the disease, it is estimated that, in the United States, it costs more than \$221 billion annually. However, indirect costs such as care and support by the care givers and the family members may be neglected (3).

Based on the level of consciousness, TBI is usually divided into three types of mild, moderate, and severe (2). Moderate to

severe brain injury, as compared to mild brain injury, often results in long-term disorders that require more rehabilitation interventions (6).

Since brain injury mainly affects young people and causes permanent neurological damage as well as due to the nature of the damage to several organs (neurological, muscular, cognitive damage), it is considered devastating (7). People with brain injury suddenly develop physical, cognitive, behavioral, and emotional disorders that can lead to severe disabilities, especially regarding their work, productivity, and social and family responsibilities (7, 8). Brain injury results in disabilities that affect the patients' quality of life and endanger their ability to perform their daily tasks and social interactions (9).

Therefore, it is essential to provide support for recovery and regaining independence through rehabilitation interventions. The process of rehabilitation for these patients includes three stages of early rehabilitation, sub-acute phase and community rehabilitation. Early rehabilitation is one of the most important phases of rehabilitation which is crucial to maintain and improve brain function, improve quality of life, and prepare the patient to return to their daily activities of and community participation (10).

According to studies and guidelines, early rehabilitation care can be categorized into three classes of early specialized thorough care, purposeful and patient-centered care, and teamwork care (11, 12). Managing patients with brain injury requires

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specialists in a variety of professions including nursing, medicine, physiotherapy, occupational therapist, speech therapist, social worker, psychologist, physical medicine and nutritionist (13-15). Early rehabilitation is an interdisciplinary and integrated intervention that begins as soon as hospital admission and is conducted with the aims of prognosis and reduction of complications of immobility, joint contracture, bladder and bowel dysfunction, skin rapture and sleeping problems (16, 17)

Early rehabilitation strategies include movement exercises in bed, moving to a chair, walking and conducting daily activities. It is also useful for patients with functional limitations and severe cognitive impairments through activities such as exercises within the patients' range of movement, use of brace and neuromuscular electrical stimuli (17).

Coordination and time management in treatment play important roles in order to obtain the best outcomes of the rehabilitation interventions (18). Early rehabilitation leads to improved neurological reorganization and thus to reduction of long-term disabilities (19). Any opportunity to participate in activities or to regain functioning and quality of life significantly requires the establishment of early, interdisciplinary, and specialized rehabilitation (20). Early rehabilitation can result in improved neurological function and subsequently functional outcomes (21). In fact, patients with severe traumatic brain injury who received early rehabilitation interventions experienced shorter acute phase, shorter hospital stay, fewer disorders, but better performance at hospital discharge (21, 22).

According to studies, there are some barriers against early rehabilitation including the nature of the disease as well as organizational barriers. Barriers regarding the nature of the disease include concerns about intracranial pressure, cerebral blood perfusion, and cerebral perfusion pressure (17). The organizational barriers introduced in the studies include increased staff overload, lack of human and financial resources, and concerns about the safety of the procedure for patients in the intensive

care unit. However, due to positive outcomes such as reduced hospital stay, accelerated patient's separation from the ventilator, improved sleeping and cost savings and helping the health-related economy, it can be of great benefit to patients in critical conditions (23, 24).

Early rehabilitation requires patient participation, proper functioning of the cardiovascular system, stable medical conditions, specialist human resources and equipment as well as teamwork (25, 26).

Conclusion

Traumatic brain injury is known as the silent epidemic due to its growing prevalence. Patients may encounter various physical, cognitive, neurological, and movement disabilities, which require early and specialized rehabilitation at the very early stages. Accurate recognition of the components of early rehabilitation and its implementation can lead to reduced hospital stay, reduced medical costs, improved neurological function, improved quality of life, and thus the patients' successful return to work and community.

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