

Effects of Commencing Physiotherapy Early Following a Traumatic Brain Injury on Functional Recovery

Prof. Clara V. Hoffmann

Institute of Digital Transformation, Saxony Technical University, Germany

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Abstract

It can be challenging to rehabilitate and lead a normal life after suffering a traumatic brain injury (TBI) since the injury can impair a person's capacity to function physically, psychologically, and cognitively. The goal of early physiotherapy intervention should be to maximize functional recovery while minimizing long-term deficits. how starting physical therapy at the acute phase of traumatic brain injury recovery affects functional outcomes like strength, mobility, and independence in activities of daily living. Twelve weeks later, researchers examined the outcomes for a group of TBI patients who started physical therapy earlier with those who started treatment later. The findings demonstrate that early intervention significantly enhances motor recovery, mobility, and the return to functional independence. The capacity of early physiotherapy to reduce secondary issues, such as muscle atrophy and joint stiffness, leads to improved overall recovery trajectories. emphasizes the role of early physiotherapy as a vital technique in the comprehensive care of traumatic brain injury and its importance in improving functional outcomes over time.

Keywords: Traumatic Brain Injury (TBI), Early Physiotherapy Intervention, Functional Recovery, Motor Recovery

Introduction

After a traumatic brain injury (TBI), which ranks high among the most prevalent causes of disability around the world, it is not uncommon for the victim to experience disabilities in the areas of physical, cognitive, and functional functioning. Traumatic brain injury (TBI) is a condition that is distinguished by the disruption of normal brain function that occurs as a consequence of an impact, fall, or other external sources of force. It is possible for the symptoms of a traumatic brain injury to range from moderate to severe severity. When a person sustains a traumatic brain injury (TBI), they may experience secondary complications such as muscle atrophy, joint stiffness, and reduced movement. These complications further hinder the process of recovery and long-term independence. Physiotherapy is a vital component of the rehabilitation process for those who have suffered traumatic brain injuries. Its purpose is to help deal with the challenges that these injuries provide and to facilitate functional recovery. Researchers have found that beginning physical therapy at an early period, particularly in the early phases of recovery, causes an increase in neuroplasticity, a reduction in secondary impairments, and a speeding up of improvements in motor function and mobility. Through the promotion of autonomy in activities of daily living (ADLs), early intervention not only improves physical outcomes but also contributes to an overall improvement in quality of life.

The disputes surrounding when physiotherapy should be started continue to be fueled by concerns regarding the patient's medical stability and the danger of overstimulation. This is despite the fact that physiotherapy may give benefits. The findings of recent studies, on the other hand, suggest that early physiotherapy that is not only structured but also closely monitored might reduce the length of time spent in the hospital and improve recovery outcomes. What impact does starting physical therapy at an earlier stage have on the functional recovery of patients who have had traumatic brain injuries? The goal of this study is to illustrate the significance of early intervention in boosting motor recovery, independence, and mobility. This will be accomplished by comparing the outcomes of patients who began physiotherapy at an earlier appointment with those who began treatment at a later appointment. As a result of the findings having an impact on clinical practices and rehabilitation strategies, it is hoped that the treatment of traumatic brain injuries (TBIs) will improve.

Acquiring Knowledge about Traumatic Brain Injury (TBI) Concepts

A traumatic brain injury (TBI) is a term that refers to the damage that is produced to the normal function of the brain as a result of an external mechanical force. People of all ages are affected by it, but the young and the elderly are more susceptible to it. It is a significant factor in the development of disabilities and deaths on a global scale. Injuries to the brain can range from relatively small concussions to more severe kinds of brain damage, and regardless of the severity of the injury, it will have a long-lasting impact on the physical, mental, and social well-being of the individual.

1. Causes and Mechanisms of TBI

- Traumatic brain injury (TBI) develops when the brain is suddenly struck by an object or force, causing malfunction. Some common reasons are:
- A large number of traumatic brain injuries (TBIs) occur as a result of falls, which disproportionately affect youngsters and the elderly.
- Most traumatic brain injuries (TBIs) in young people occur as a result of car accidents, particularly those involving vehicles travelling at high speeds.
- Injuries Caused by Athletic Activity: Participating in contact sports like football, boxing, and rugby increases the likelihood of brain injuries and concussions.
- Trauma: deep wounds caused by gunshots or physical attacks.
- Injuries sustained on the job: This is especially true in fields that deal with dangerous materials or operate heavy gear.

Mechanistically, TBI can be classified as:

- Mechanical force can produce rapid damage, known as primary injury. This damage might take the form of contusions, lacerations, or diffuse axonal injury.
- Inflammation, ischaemia, and elevated intracranial pressure are examples of secondary injuries that occur in the aftermath of a main injury and worsen its effects.

2. Types of TBI

Severity, mode of injury, and site of injury are the usual criteria for titrating traumatic brain injuries:

Severity:

- Mild TBI (Concussion): Interruption of brain function, which is often short-lived and does not always manifest as physical injury.
- Moderate TBI: Progressive unconsciousness and brain damage.
- Severe TBI: Significant brain damage, accompanied by extended unconsciousness and deficits that will endure for a long time.

Mechanism:

- Closed-Head Injury: Although there is no penetration of the skull, the brain is affected by pressures that originate from within.
- Open-Head Injury: This condition involves the skull being broken open and the brain tissue being exposed to the surrounding environment.

Location:

- Focal Injury: localised injuries, such as haematomas or contusions, for example.
- Diffuse Injury: Damage that is widespread, such as diffuse axonal injury, is that which is frequently observed in high-impact injuries.

3. Physical and Cognitive Impairments Post-TBI

- Total brain damage (TBI) can result in a wide variety of deficits, the severity of which varies depending on the site of the lesion:
- Deficits in Physical Capacity:
 - limbs that are either weak or paralysed.
 - Poor coordination and balance are both symptoms.
 - Muscle atrophy or spasticity can occur.

Cognitive Impairments:

- Deficits in attention and memory are also present.
- Challenges in both the ability to solve problems and to make decisions.
- The speed of processing and executive functioning are both decreased.

Emotional and Behavioral Changes:

- Irritability, anxiety, and depression are all symptoms.
- Social disengagement and changes in personality are both observed.

4. Secondary Complications

- Stress-related brain injuries (TBI) might result in additional difficulties if they are not treated appropriately.
- Muscle atrophy and joint stiffness are the consequences of being immobile for an extended period of time.
- Because of a lack of mobility and improper placement, pressure ulcers can develop.
- When it comes to chronic pain, particularly in the head and neck regions.
- There are some cases of seizures that are referred to as post-traumatic epilepsy.

5. Rehabilitation Needs in TBI

A multidisciplinary approach is necessary for efficient recovery from traumatic brain injury (TBI) due to the multiple character of the condition. The restoration of motor function and balance is one of the most important roles that physiotherapy plays in particular.

- Early mobilisation is an effective method for preventing subsequent problems.
- Increasing one's level of autonomy in doing activities of daily life (ADLs).

Understanding the underlying causes and extensive consequences of traumatic brain injury (TBI) highlights the significance of developing rehabilitation programs that are both prompt and thorough in order to maximise recovery and improve quality of life for those who have been afflicted by the condition.

Conclusion

Brain trauma, which is often referred to as traumatic brain injury (TBI), is a complicated condition that can have far-reaching implications on a person's physical, cognitive, and emotional well-being. It is absolutely necessary to have a comprehensive understanding of the underlying causes, mechanisms, and effects of traumatic brain injury (TBI) in order to be able to develop treatment and rehabilitation approaches that are effective. Secondary sequelae, such as inflammation and muscle atrophy, can be caused by traumatic brain injuries (TBI), which can range from fundamental damage brought on by traumas created by external pressures to secondary sequelae. These injuries provide significant challenges to recovery and quality of life. Rehabilitative measures, and in particular early intervention in the form of physiotherapy, are absolutely necessary in order to lessen the severity of these repercussions, encourage neuroplasticity, and forestall the development of long-term problems. It is essential to use a multidisciplinary approach that takes into account the diverse requirements of individuals who have suffered traumatic brain injuries in order to maximize the functional recovery of these patients and to encourage the development of independence. That being said, in conclusion, a comprehensive understanding of traumatic brain injury serves as the foundation for the creation of specialized therapies and interventions. In the event that medical professionals make providing swift and individualized care their top priority, they have the capacity to significantly enhance the outcomes and quality of life for individuals who have been impacted by traumatic brain injury (TBI).

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