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Editorial

Emerging New Strategies to Improve Outcomes of Patients with Spinal Cord Injury

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Each year, a substantial number of individuals worldwide, ranging from 250,000 to 500,000, experience spinal cord injury (SCI). In India, the prevalence of SCI is also higher. The age group most susceptible to SCI falls within the 16-30-year range, males are at a higher risk, particularly due to sports-related injuries. SCI remains a thorn side of the neurological disorder that often leads to severe morbidity and lifelong disability. The injury occurs as a result of trauma, causing damage to the spinal cord or its nerve root axons, consequently resulting in the loss of sensory, motor, and autonomic functions. This condition poses immense physical and psychological stress for patients and their caregivers, along with significant economic burdens.

Following SCI, the patient's quality of life (QOL) and life expectancy significantly depend on the collective efforts of a well-integrated inter-professional healthcare team. While rehabilitation and medical management aim to optimize the patient's condition, achieving substantial neuroplastic changes remains challenging. In light of this, recent advanced emerging technologies such as robotics, brain-computer interfaces, and stimulation devices are being increasingly explored as potential interventions to evaluate and treat motor and functional impairments in SCI patients.

One such innovative approach currently under investigation is epidural stimulation (ES) for SCI patients. Extensive research has been conducted to assess the effectiveness of ES in motor function recovery and its impact on the central pattern generators (CPGs) of locomotion. Initially, ES was utilized for pain relief, currently, ES has evolved to address motor function improvement. Studies have demonstrated the potential benefits of ES for SCI patients, with a particular focus on enhancing motor skills, locomotion, and functional activities. However, previous investigations have often overlooked the comprehensive outcome measures aligned with the categories and components of the International Classification of Functioning, Disability, and Health (ICF). ICF gives a universally accepted framework to categorize the levels of functioning, disability and health conditions including spinal cord injuries. Associating outcome measures (OMs) with the ICF and intervention outcomes is an important factor, as it gives a base knowledge about which ICF taxonomy has been most frequently targeted, and which areas need to be addressed further in future studies. More focused studies are required in this field as the treatment approach is also currently growing and a smaller number of studies were found. The studies of epidural stimulation rehabilitation for SCI patients included are generally low in methodological quality. It is recommended that future studies employ good methodological designs, eliminate the chances of risk of biases in the results and identify the good OMs linking with the ICF framework so as to improve the overall QOL of the SCI patients.