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Traumatic Spinal Cord Injury: An Overview

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Editorial

Traumatic spinal cord injury (SCI) is a life-altering neurological illness that has significant socioeconomic consequences for patients and caregivers. SCI patients' diagnosis, stability, survival rate, and well-being have all improved as a result of recent breakthroughs in medical therapy. However, there has been little improvement in terms of therapy possibilities for improving SCI patients' neurological results. The intricacy of SCI pathophysiology, as well as the numerous biochemical and physiological changes that occur in the injured spinal cord, account for this gradual success. As a result, SCI researchers have spent the last few decades attempting to understand the pathophysiology of SCI as well as the underlying cellular and molecular mechanisms of tissue degeneration and regeneration in the injured spinal cord. To this purpose, a variety of preclinical animal and injury models have been created in order to better mimic the main and secondary injury processes of SCI. We will give a detailed summary of recent improvements in our understanding of the pathophysiology of SCI in this review. We'll also go through the neurological results of human SCI, as well as the experimental model systems that have been used to figure out how SCI works and find treatments for it.

SCI is a devastating neurological illness that has a significant socioeconomic impact on afflicted people and the health-care system. Each year, 12,500 new cases of SCI are reported in North America, according to the National Spinal Cord Injury Statistical Center. More than 90% of SCI cases are traumatic in nature, resulting from events such as traffic accidents, violence, sports, or falls. SCI has a documented male-to-female ratio of 2:1, with adults experiencing it more commonly than children. Men are most affected throughout their early and late adulthood (3rd and 8th decades of life), but women are more vulnerable during youth (15–19 years) and the 7th decade of life. The age distribution is bimodal, with a first peak of young adults and a second high of those over 60 years old. SCI patients over the age of 60 have significantly worse results than younger patients, and their injuries are typically caused by falls and age-related bone abnormalities.

SCI can result in partial or full loss of sensory and/or motor function below the level of injury, depending on the degree and location of the lesion. Lesions in the lower thoracic region can produce paraplegia, but lesions in the cervical region can cause quadriplegia. SCI primarily affects the cervical level of the spinal cord (50 percent of the time), with C5 being the most commonly afflicted level. The thoracic level (35 percent) and the lumbar region are two more areas where injuries occur (11 percent). SCI patients often survive catastrophic injuries and live for decades after the initial injury thanks to recent advances in medical techniques and patient care. For people with tetraplegia and paraplegia, the 40-year survival rate was 47 percent and 62 percent, respectively.

The level of injury and preserved functions have a significant impact on the life expectancy of SCI patients. Patients with ASIA Impairment Scale (AIS) grade D who require a wheelchair for daily activities, for example, have a life expectancy of 75 percent of that of a normal person, whereas patients who do not require a wheelchair or catheterization have a life expectancy of up to 90 percent of that of a normal person. A SCI patient's lifetime cost is currently projected to be $2.35 million. As a result, understanding the cellular and molecular causes of SCI and developing novel effective treatments for this debilitating disorder is crucial. A great deal of research has been done in preclinical and clinical SCI over the last few decades in the hopes of discovering new treatment targets for traumatic SCI [1-5] .

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Conflict of Interests

None.

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