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Cervical Spinal Cord Injury

Melissa Schimmel
Otterbein University, melissa.schimmel@otterbein.edu

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The spinal cord is a complex structure that contains nerves that serve as a communication system for the body (Saran, Safi, & Atkinson, 2013, p. 319). The spinal cord relays sensory information along with motor and autonomic functions to and from the brain. The spinal cord contains the sensory and motor neurons that make up the peripheral nervous system. Disorders of the spinal cord can occur at any level of the spinal cord (Saran, Safi, & Atkinson, 2013, p. 319). The spinal cord injuries are caused by trauma to the spinal cord, injury, motor and sensory losses. The spinal cord injuries may also be classified as a complete or incomplete injury, below the level of injury (NINDS, 2013, p.323). The incomplete injury is characterized as a mild to moderate impairment of the cord resulting in nerve cell death or paralysis (Atkinson & Atkinson, 2011, p.5). These complications can occur at any level of the spinal cord and can be stopped, but the amount of recovery depends on the treatment and interventions the patient receives.

**Pathophysiologic Process**

A spinal cord injury occurs when there is any damage to the spinal cord that blocks communication between the brain and the body (Shepherd Center, 2011, p.1). When the vertebrae are dislocated or broken, they are placed on the spinal cord and destroy the sensitive axons that carry signals up and down the spinal cord. This is a significant primary injury mechanism. Minor injuries to the spinal cord do not cause significant spinal cord cell death, but can cause demyelination without neural damage (Saran, Safi, & Atkinson, 2014, p.43). Major injuries and pressure on the vertebrae or cause complete cell death across the injured area and may occur within an hour of initial injury (Saran, Safi, & Atkinson, 2014, p.43). The inflammation response after a SCI occurs within hours of the onset of injury (Saran, Safi, & Atkinson, 2013, p.322). The secondary injury phase begins after the extent of ischemia is determined. This secondary phase is the spreading of tissue damage from the initial insult to the peripheral tissues and vascular damage (Saran, Safi, & Atkinson, 2013, p.322). These injuries may further damage local tissue and reovat other inflammatory cells like monocytes, macrophages and local microglia that will phagocyte the injured site (Saran, Safi, & Atkinson, 2013, p.323).

The ficear are reparable and regeneration occurs in the cord to an extent to reduce the spread of the lesion, forming a scar (Saran, Rowland & Fehlings, 2013, p.43).

Cervical spinal injury depends on the level of the injury. Injuries of C1 to C4 are the most severe and can result in loss of consciousness, flail extremities and torso. Patients with C1 to C4 injuries may lose the ability to breathe, cough, and control their bowel and bladder (Colangelo, 2014, p.39). These patients are at risk for autonomic dysreflexia. Cervical cord lesions are characterized as a combination of motor and sensory losses (Colangelo, 2014, p.20, 25). Patients with C7 to C8 injuries are usually less severe but still require medical attention and movement and sensation. Patients with C7 to C8 injuries can breathe independently and have the potential to breathe and cough on their own. Injuries at C5 or C6 typically include total or partial paralysis, with or without assistance and some can even drive a vehicle that is adapted to their needs (Shepherd Center, 2011, p.5).

**Dysfunction Severity Related to Injury Level**

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<tr>
<th>Level</th>
<th>Symptom</th>
<th>Response</th>
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