

Abstract

According to the Neurovisceral Integration theory (NVI), inhibition and flexibility regulate goal-oriented behavior. The central and autonomic nervous systems (CNS-ANS) interact for inhibition and flexibility. The spinal cord acts as a conduit between the brain and the body to execute goal-oriented behavior. Thus spinal cord injury disrupts this conduit resulting in physical, autonomic, and psychological consequences. Depression is an important sequel to spinal cord injury with somatic and cognitive-affective manifestations. The NVI theory postulates that impaired autonomic nervous system function results in impaired inhibition and flexibility, thereby predisposing an individual to be at risk of developing depression. Literature shows variability in the prevalence of depression in spinal cord injury. On the other hand, literature shows that depression is associated with impairment of the autonomic nervous system. Thus, this thesis aims to understand how the nervous system impairment caused by the injury contributes to depression in spinal cord injury.

The thesis has three studies to study the nervous system's role in depression. Chapter 3 showed the first study results indicating an impaired autonomic nervous system function in spinal cord injury participants with the probable major depressive disorder than non-depressed participants. Coping with injury is the psychological adjustment to dealing with the injury, thereby influencing depression. Thus, coping autonomic nervous system function and depression were also studied. There was a significant relation observed. A low depression score was associated with better coping and high autonomic nervous system function. The "Disability Paradox" phenomenon was associated with high autonomic nervous system function when depression was studied longitudinally.

Depression in spinal cord injury has somatic and cognitive manifestations. According to the NVI theory, the autonomic nervous system regulates the affect and processes. As described in chapter 4, the subsequent study compared spinal cord injury participants' affect and cognitive process with age-matched healthy participants. The spinal cord participants had an impaired affect process than healthy controls. The cognitive process did not show any difference. The results indicated that the autonomic nervous system function is impaired more in the affect process than in the cognitive process.

As described in chapter 5, the study evaluated the autonomic nervous system during the affect and cognitive process. The results showed low autonomic nervous system function in spinal cord participants than healthy controls.

Chapter 6 analyzed the participants' affect state and autonomic regulation included in studies described in chapter 4 and 5. The study results showed a negative affect state in spinal cord participants with low autonomic regulation.

The spinal cord is a part of the central nervous system. Thus an injury to the spinal cord results in impaired affect and cognitive processes. Literature shows depression to have cognitive-affective manifestations in spinal cord injury. This thesis tried to understand the role of the impaired nervous system in developing depression in spinal cord injury.