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Poster Presentation

Spreading Depression in the Brain Cortex and Spinal Cord

Ahmad Ali Lotfinia*, Milad Ahmadi, Babak Khodaie, Mahmoud Lotfinia, Ali Gorji

Shefa Neuroscience Research, Khatam Alanbia Hospital, Tehran, Iran.

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Abstract

Cortical spreading depression (CSD) has been suggested to underlie some neurological disorders such as migraine. Despite the intensity with which many investigators have studied SD in the brain, only a few studies have aimed to identify SD in the spinal cord. Here we described the main characteristic features of SD in the spinal cord induced by different methods including various spinal cord injury models and demonstrated that SD enhances the spinal cord activity following a transient suppressive period. These findings suggest that SD may play a role in the mechanisms of spinal neurogenic shock, spinal cord injury, and pain. Furthermore, we studied the effect of CSD on the neuronal activity of the spinal cord. CSD was induced via cortical pinprick injury or KCl injection in the somatosensory cortex. CSD did not propagate into the cervical spinal cord. However, intracellular recordings of the neurons in the dorsal horn of C2 segment, ipsilateral to the hemisphere in which CSD was evoked, showed a transient suppression of spontaneous burst discharges, followed by a significant enhancement of the neuronal activity. This indicates a link between a putative cause of the neurological symptoms and the subsequent pain of migraine.

Keywords: Cortical Spreading Depression, KCL, Spinal Cord Injury.

***Corresponding Author:** Ahmad Ali Lotfinia

E-mail: ahmad6800@yahoo.com