

Corticosteroids and heart rate variability in spinal cord injury

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Introduction Spinal cord injury (SCI) is an insult to the spinal cord resulting in a change, either temporary or permanent, in the cord's normal motor, sensory, or autonomic function. SCI may cause loss of cardiovascular reflexes mediated by sympathetic drive due to interruption supraspinal control of spinal sympathetic motoneurons. Aim: The purpose of this study was to analyze sympathovagal balance after acute spinal cord injury demonstrated by the linear measures in time and frequent domain of heart rate variability (HRV) and effect of corticosteroids on the HRV parameters.

Methods We have analyzed a sample of 40 tetraplegic patients after acute spinal cord injury and 40 healthy persons of the controls. In the group with cervical spine injury 29 patients received a corticosteroid therapy, and 11 did not. Cardiac autonomic balance was evaluated by analysis of HRV in time and frequents domain.

Results The ratio of low and high frequencies (LF/HF) was significantly reduced in the groups of patients with acute trauma with and without corticosteroid therapy, as compared to controls. However there was no statistically significant difference in the two SCI groups. [(1.74 (0524) with corticosteroids therapy and 1.75 (0534) without)].

This study establishes analyzing of the heart rate variability (HRV) by linear methods as objective measures of normal and abnormal function of autonomic nervous system.

Conclusion This study shows that sympathovagal balance is altered in quadriplegic patients in acute phase of cervical spinal cord trauma. SCI causes dysfunction of the autonomic cardiovascular regulation demonstrated by the spectral measures of heart rate variability and leads to disturbances of modulatory sympathetic activity on cardiovascular system. Finally, the effect of corticosteroids on the parameters of HRV in SCI patients was not found.

Keywords Cervical spinal cord injury • Corticosteroid therapy • Heart rate variability • Sympathovagal balance