EFFECTS OF ROBOT-DRIVEN GAIT ORTHOSIS TREADMILL TRAINING ON THE AUTONOMIC RESPONSE IN REHABILITATION-RESPONSIVE STROKE AND CERVICAL SPONDYLOTIC MYELOPATHY PATIENTS.

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ABSTRACT

Body weight supported treadmill training (BWSTT) assisted with a robotic-driven gait orthosis is utilized in rehabilitation of individuals with lost motor skills. A typical rehabilitation session included: sitting, standing, suspension, robotic-assisted walking at 1.5 and 2.5km/h, respectively with 50% body weight support and recovery. While the effects of robotic-assisted BWSTT on motor performances were deeply studied, the influences on the cardiovascular control are still unknown. The aim of the study was to evaluate in stroke (ST) and cervical spondylotic myelopathy (CSM) patients: (1) the autonomic response during a traditional robotic-assisted BWSTT session of motor rehabilitation; (2) the effects of 30 daily sessions of BWSTT on cardiovascular regulation. The autonomic response was assessed through symbolic analysis of short-term heart rate variability in 11 pathologic subjects (5 ST and 6 CSM patients) whose motor skills were improved as a result of the rehabilitation therapy. Results showed variable individual responses to the rehabilitation session in ST patients at the beginning of the therapy. At the end of the rehabilitation process, the responses of ST patients were less variable and more similar to those previously observed in healthy subjects. CSM patients exhibited an exaggerated vagal response to the fastest walking phase during the first rehabilitative session. This abnormal response was limited after the last rehabilitative session. We conclude that robotic-assisted BWSTT is helpful in restoring cardiovascular control in rehabilitation-responsive ST patients and limiting vagal responses in rehabilitation-responsive CSM patients.