ROBOTIC-ASSISTED LOCOMOTOR TRAINING IMPACT ON NEUROMUSCULAR PROPERTIES AND MUSCLE STRENGTH IN SPINAL CORD INJURY.

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ABSTRACT

We studied the effects of Robotic-Assisted Locomotor (LOKOMAT) Training on neuromuscular properties and muscle strength of the spastic ankle in persons with incomplete Spinal Cord Injury (SCI). LOKOMAT training was performed 3 days/week during a 1-hr period including set-up time. The training was provided for 4 weeks and subjects were evaluated before and after 1, 2, and 4 weeks of training. A system identification technique was used to quantify the effects of LOKOMAT training on neuromuscular abnormalities. The effect of LOKOMAT training on muscle strength was determined by measuring isometric maximum voluntary contraction (MVC) of ankle extensor and flexor muscles. Our results indicated that the reflex stiffness, abnormally increases in SCI, was significantly reduced (up to 65%) following 4-weeks of LOKOMAT training. Similarly, intrinsic (muscular) stiffness, which also abnormally increases in SCI, decreased significantly (up to 60%). MVCs were increased substantially (up to 93% in extensors and 180% in flexors) following 4-week training. These findings demonstrate that LOKOMAT training is effective in reducing spasticity and improving muscle strength in SCI.