

IMPACT OF PASSIVE LEG MOVEMENT ON LOWER LIMB VASCULAR FUNCTION IN PATIENTS WITH A SPINAL CORD INJURY

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Background: Individuals with spinal cord injuries (SCI) are at a greater risk for developing cardiovascular diseases. Of note, post injury mediated increases in physical inactivity leads to muscle atrophy, which also results in vascular dysfunction in this population. Although a growing body of evidence suggests that passive leg movement (PLM) may be a useful exercise modality to improve peripheral blood flow and skeletal muscle activation in individuals with limited mobility, few studies have examined the impact of PLM on local skeletal muscle blood flow. Therefore, there is a need to examine the impact of PLM on lower limb vascular function and skeletal muscle oxygen utilization capacity in patients with SCI. **Methods:** Individuals with SCI (n=2) and healthy age-matched controls (CON, n=5) were recruited for this study. Participants were fitted with a standard knee brace and were instructed to rest in the seated position for 20 minutes with their legs bent at 90°. PLM was performed by flexion and extension of the lower leg (90°-180°) at a rate of 1 Hz (60 bpm) for 5 minutes. A Doppler ultrasound was located on the superficial femoral artery, and blood flow and diameter were measured for 5 minutes at rest and during the PLM protocol. Following the PLM protocol, the leg was held in the extended position (180°) for 5 minutes of recovery. **Results:** We found that the SCI group had a significantly lower blood flow response to PLM compared to the CON group ($p=0.004$). Furthermore, post-PLM femoral artery blood velocity and shear rate significantly increased in both SCI and CON compared to pre-PLM ($p=0.014$, and $p=0.016$, respectively) but no differences were found between groups. Finally, the SCI group had significantly smaller vessel diameters compared with CON ($p<0.001$). **Conclusion:** We found that PLM could efficiently increase blood flow and blood velocity in SCI. Although the magnitude of this increase was significantly lower in SCI compared to healthy age-matched control, PLM produced shear rates in the leg arteries that were similar between SCI and CON, which indicates that PLM may potentially be an efficient exercise modality to improve leg vascular function in individuals with SCI.