

Muscle strength and control characteristics are altered by peripheral artery disease

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Objective: Peripheral Artery Disease (PAD) is a common manifestation of atherosclerosis, characterized by lower leg ischemia and myopathy in association with leg dysfunction. Patients with PAD have impaired gait from the first step they take with consistent defects in the movement around the ankle joint, especially in plantar flexion. Our goal was to develop muscle strength profiles to better understand the problems in motor control responsible for muscle performance during walking in patients with PAD.

Methods: Ninety-four claudicating patients with PAD performed maximal isometric plantar flexion contractions in two conditions: pain-free (well rested and without claudication) and pain-induced (patient experiencing claudication). Sixteen matched healthy Controls performed the pain free condition. Torque curves were analyzed for dependent variables of muscle strength and

motor control. Independent t tests were used to compare variables between groups and dependent t tests determined differences between conditions.

Results: Patients with PAD had significantly reduced peak torque and Area Under the Curve compared to Controls. Measures of control differed between PAD conditions only.

Conclusions: The current study conclusively demonstrates that the plantar flexor muscles of patients with PAD without pain are weaker compared to Controls. With the onset of claudication pain, patients with PAD exhibit altered muscle control strategies and further strength deficits are manifest compared to baseline levels. The myopathy of PAD legs appears to have a central role in the functional deterioration of the calf muscles, as it is evident both before and after onset of ischemic pain.