Rapid Foot and Calf Compression Increases Walking Distance in Patients with Intermittent Claudication: Results of Randomized Study.

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Objective: The aim of our pilot study was to determine the usefulness of rapid, high pressure, intermittent pneumatic calf and foot compression (IPCFC) in patients with stable intermittent claudication, with reference to the end points of improvement in initial claudication distance (ICD) (distance at which patient feels pain or discomfort in the legs), and improvement in absolute claudication distance (ACD) (distance at which patient stops walking because the pain or discomfort becomes severe.

Methods: Thirty male patients presenting with stable, intermittent claudication (ACD between 50 and 150 meters on treadmill testing at 3.8 km/h, 10° gradient) were recruited into this pilot study from a single center. Fifteen patients were randomized to treatment with IPCFC (applied for 1 hour twice daily in the sitting position) and were also advised to have daily exercise, and 15 patients served as controls, who were advised exercise alone. All patients received aspirin and had resting and post exercise ankle/brachial index (ABI) measured at enrollment along with ICD and ACD on treadmill testing (3.8 km/h, 10° gradient). The mean age, baseline ICD, and ACD of the treatment and control groups were 70.4 ± 7 years and 70.7 ± 9 years, 55.8 ± 15 meters and 68.4 ± 17 meters, and 86.7 ± 19 meters and 103.9 ± 27 meters, respectively. Both groups were equally matched for risk factors, including smoking, type II diabetes mellitus, and hypercholesterolemia. IPCFC was applied. The study protocol included follow-up visits at 1, 2, 3, 4, 6, and 12 months with ABI, ICD, and ACD being measured at every visit.

Results: The percentage change from baseline for ICD and ACD for each patient visit and the mean ± standard deviation (SD), standard error (SE), and median were calculated for the control and treatment groups. The percent change from baseline measurements (mean ± SD) for ICD and ACD in control groups at 4, 6, and 12 months were 2.2 ± 18 and 2.3 ± 18, 2.9 ± 17, and 5.2 ± 20, and 3.6 ± 18 and 5.8 ± 20, respectively. In contrast, the changes in ICD and ACD at 4, 6, and 12 months in the treatment group were 137.1 ± 128 (P< .01) and 84.3 ± 82 (P< .01), 140.6 ± 127 (P< .01) and 96.4 ± 106 (P= .01), and 150.8 ± 124 (P< 0.01) and 101.2 ± 104 (P< 0.01), respectively. Although the ABI showed a slight increase in the treatment group, these differences were not statistically significant.

Conclusion: The results of this pilot study show that IPCFC improves walking distance in patients with stable intermittent claudication. A significant increase in ICD and ACD was seen and 4 and 6 months of treatment respectively, and the improvement was sustained at 1 year. The combination of IPCFC with other treatment such as risk-factor modification and daily exercise may prove useful in patients with peripheral arterial occlusive disease. It may be useful first line of therapy in patients with disabling claudication who are unfit for major reconstructive surgery. Improved walking on long-term follow-up and experience from different centers may establish a role for the treatment modality in the future.