

## Intermittent Pneumatic Calf and Foot Compression Improves Walking Distance in Patients with Claudication: Results of a Randomized Study

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**Background:** The aim of our 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 (a) improvement in initial claudication distance (ICD) (distance at which patient feels pain or discomfort in the legs), and, (b) 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 50-150 meters on treadmill testing at 3.8 km/h, 10-degree gradient) were recruited into this Institutional Review Board approved study. Fifteen patients were randomized to treatment with IPCFC (applied for 1 hour twice daily in the sitting position) and also advised daily exercise, and fifteen patients served as controls who were advised exercise alone. All patients had resting and post-exercise ankle-brachial index (ABI) measured at enrollment along with ICD and ACD on treadmill testing (3.8km/h, 10-degree gradient). The mean age, ICD, ACD, and risk factors for the treatment and control groups were equally matched. IPCFC was applied using the ArtAssist<sup>®</sup> device (ACI Medical, Inc., San Marcos, CA, USA) with follow-up visits at one, two, three, four, six months and one year.

**Results:** The percent change from baseline measurements (mean  $\pm$  SD) for ICD and ACD in the control group at 4, 6, and 12 months were  $2.2 \pm 18$  and  $2.3 \pm 18$ , and  $2.9 \pm 17$  and  $5.2 \pm 20$ , and  $3.6 \pm 18$  and  $5.8 \pm 20$  respectively. In contrast, the changes in ICD and ACD at 4, 6, and 12 months in the treatment group were  $137 \pm 128$  ( $p < 0.0001$ ) and  $84.3 \pm 81$  ( $p < 0.0001$ ),  $140 \pm 127$  ( $p < 0.0001$ ) and  $96 \pm 105$  ( $p < 0.0001$ ), and  $150.8 \pm 123$  ( $p < 0.0001$ ) and  $101.2 \pm 103$  ( $p < 0.0001$ ) respectively. Although ABI showed a slight increase in the treatment group, these differences were not statistically significant.

**Conclusions:** The results of this study show that IPCFC improves walking distance in patients with stable intermittent claudication. A significant increase in ICD and ACD was seen at 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 modifications and daily exercise may prove useful in patients with PAOD. It may also be useful 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 this treatment modality in the future.