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# Ankle Isokinetic Rehabilitation in Intermittent Claudication Management: A Focus on Muscle Dynamics and Functional Adaptation

**Topic:** Miscellaneous

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## BACKGROUND

Intermittent claudication (IC), the primary symptom of lower extremity peripheral arterial disease (PAD), significantly impairs mobility and quality of life. While rehabilitation and physical exercise are recommended, the role of ankle muscle dysfunction in IC progression remains underexplored. Plantar flexor weakness and muscle imbalance are key contributors to gait limitations in PAD. Isokinetic training may help restore muscle strength, balance, and functional capacity. This study aimed to evaluate the effects of an ankle isokinetic rehabilitation program on muscle strength, pain reduction, functional capacity, and muscle balance in IC patients.

## METHODS

This prospective study included 25 patients diagnosed with intermittent claudication (IC), all of whom were eligible for rehabilitation. The patients underwent a six-week ankle rehabilitation protocol, with three sessions per week, using a HUMAC NORM isokinetic dynamometer at the Physical and Rehabilitation Medicine Department of Ibn Rochd University Hospital in Casablanca. The rehabilitation protocol targeted the plantar flexors through eccentric training at 120°/s and the dorsiflexors through concentric training at 60°/s. To assess the impact of the rehabilitation, clinical evaluations were performed before and after the program, including the Visual Analog Scale (VAS) for pain, weekly claudication frequency, and systolic pressure index. Functional tests, including the six-minute walk test (6MWT) and the Borg scale for perceived exertion, were also conducted. In addition, isokinetic assessments were made to measure peak torque (Nm/kg) and the plantar-to-dorsiflexor ratio (PF/DF ratio) using the dynamometer.

## RESULTS

Following the isokinetic ankle rehabilitation protocol. Pain intensity, measured by the VAS, decreased significantly from 6.7 ± 1.3 to 3.1 ± 1.4 ($p < 0.001$). The distance walked during the 6MWT increased from 210 ± 40 meters to 330 ± 50 meters ($p < 0.001$), indicating improved functional capacity. Mean weekly claudication episodes were reduced from 12 ± 3 to 4 ± 2 ($p < 0.001$). The isokinetic assessment revealed a 29% increase in peak plantar flexor torque ($p = 0.004$), and the PF/DF ratio changed from 1.9 ± 0.4 to 1.3 ± 0.2 ($p < 0.001$).

## CONCLUSION

The isokinetic rehabilitation protocol significantly improved symptoms, muscle strength, endurance, and balance in IC patients. These findings support its integration into vascular rehabilitation programs. Future randomized controlled trials comparing isokinetic training with conventional approaches are needed to confirm its efficacy.

**Statement of Disclosures**

None

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