The effects of kinetic physical therapy in the rehabilitation of peripheral arterial disease

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Abstract

Background. A growing number of studies show physical training benefits in atherosclerosis and peripheral artery disease (PAD). The increase of these benefits can be achieved by combining exercise with physical therapy, whose effectiveness in the recovery of PAD has also been demonstrated over time.

Aims. This study aims to investigate the effect of physical-kinetic therapy on the recovery of atherosclerosis and PAD patients with and without signs of intermittent claudication.

Methods. A total of 68 consecutive patients diagnosed with PAD by determining the ankle-brachial index were randomized into two groups, one active and one control, in a ratio of 1:1. Group A (active) benefited from treatment facilities (baths with carbonated mineral water at a temperature of 34°C with a progressively increased duration from 15 to 25 minutes, mofette with a progressively increased duration from 10 to 20 minutes) and physical therapy, consisting of interval walking, postural Burger gymnastics, Master scale, ergonomic bicycle, semiflexion of the knees. Intensity of exercise was limited by pain in those with claudication and in those without claudication it was quantified by using the self evaluation Borg scale or by evaluating the intensity of exercise by pulse meter, a device that allows monitoring of heart rate during exercise and thus the intensity of exercise performed. Group B (control) was treated with physical therapy, consisting of carbonated mineral water baths of 34^{o}C, 15 to 25 minutes, and mofette 10-20 minutes. Treatment duration was 18 days in both groups.

Results. Of a total of 68 patients, 65 completed the study (33 in the active group and 32 in the control group). At the end of treatment, in both groups there was a significant improvement in the distance walked for 6 minutes ($p \leq 0.05$) and no statistically significant increase in the ankle-arm index was found. In group A we found a significant increase in the short duration functional parameters (4-meter walking speed in a normal and quick rhythm and the standing up test), while in group B these parameters were not significantly increased. There was also a significant increase in the distance walked for 6 minutes and in the short duration functional parameters in group A compared to group B.

Conclusions. Carbon dioxide therapy significantly increased walking ability as measured by the 6 minute walking test. Physical training provided additional benefits in terms of ability to walk and also significantly improved strength and endurance in the legs, measured by short duration physical performance tests. Neither exercise, nor carbon dioxide therapy significantly increased the ankle-arm index value after 18 days of treatment.

Keywords: exercise, peripheral arterial disease, balneotherapy, ankle-brachial index.