

# The effects of Crenotherapy and exercise in peripheral arterial occlusive disease.

## A comparison with simple exercise training



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The effects of Crenotherapy and exercise in peripheral arterial occlusive disease. A comparison with simple exercise training.

**BACKGROUND:** Conservative therapies for patients affected by Peripheral Arterial Occlusive Disease (PAOD) aim first to correct the risk factors and to slow down the disease progression. Among these, exercise has positive effects on blood flow, muscle metabolism and well demonstrated systemic effects. These include reduction of chronic inflammation markers, improvement of walking mechanics and heart function. Controlled physical training increases the ability to perform the daily activities improving life expectancy of these patients. The aim of this study is to evaluate the effects and the effectiveness of physical training performed in thermal water compared to traditional treadmill walking exercise.

**METHODS:** 98 patients affected by IIb stage PAOD, according to Leriche-Fontaine classification, were enrolled. Patients were randomized into two groups: the first arm carried out an intensive training program under medical supervision (group A); the second one carried out a rehabilitative exercise associated with crenotherapy (group B). The following parameters were detected: Ankle-Brachial pressure index (ABI), actual claudication distance (ACD), maximum walking distance (MWD), flow mediated dilatation (FMD) and the intima-media thickness (IMT). All patients underwent Doppler echocardiography and complete biochemical assay.

**RESULTS:** In both groups, there was a statistically significant improvement of lipidaemia compared to baseline. When compared with each other, the two groups did not show statistically significant differences. There were no significant differences between the two groups regarding echocardiographic findings. Vascular reactivity study showed a statistically significant improvement of FMD after 3 months of exercise in both groups. In crenotherapy group (B) FMD values were significantly higher than the treadmill ones (A). In both groups a statistically significant improvement in ACD was observed.

**CONCLUSIONS:** Our experience shows that crenotherapy has similar effects compared to traditional physical training in the treatment of PAOD, being equally well tolerated and safe; it gives an advantage over conventional physical training in terms of ACD and MWD improvement, although not statistically significant, and it is extremely welcome to patients compared to traditional physical training.

**KEY WORDS:** Arterioscleroses, Intermittent Claudicatio, Peripheral Arterial Diseasen, Physical Exercise, Rehabilitation

### Introduction

Peripheral arterial occlusive disease (PAOD) is a chronic condition caused by an obstruction to blood flow in the aortic-iliac-femoral-popliteal-tibial district.

Atherosclerosis is the main etiological factor<sup>1</sup>. According to the National Cholesterol Education Program - Adult Treatment Panel III (NCEP-ATP III), PAOD, as well as diabetes, abdominal aortic aneurysm and symptomatic carotid disease, determines a cardiovascular risk equivalent to that of coronary heart disease. The PAOD is a very common condition whose diagnosis is often underestimated; its prevalence, evaluated in different epidemiological studies<sup>2-4</sup> with specific tests such ABI (ankle-brachial-index), is of 3-10%, with a maximum of 15-20% in subjects with more than 70 years. The annual

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incidence increases with age: it is 0.6 in 45-54 years old patients, 2.5% in 55-64 ones and 8.8% in 65-74 ones. PAOD tends to be twice more frequent in males than women between 50-70 years, but this difference decreases in over 70s<sup>5</sup>. The ratio between symptomatic and asymptomatic form is of 1: 3 - 1: 4 and the majority of symptomatic patients is over 60.