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Interference of day-to-day activities on the working pressures in patients using elastic stockings

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Abstract

The objective of current study was to evaluate if day-to-day activities can exert an influence on the treatment of patients that use elastic stockings. Working pressures during day-to-day activities were evaluated. Five male and five female individuals, with ages varying from 36 to 47 years old, participated in the study. They were requested to continue with routine day-to-day activities during the evaluation period. Sigvaris® 30/40 mmHg elastic stockings were utilized. An apparatus that assesses the pressure at half-second intervals, either dynamically or under static conditions was employed. The individuals were monitored for variable lengths of time of from one to three hours and at the end of data collection, the measurements were expressed as pressures at half-second intervals in the form of a graph. Pressure variations were identified in accordance to the muscle activity, mainly when the calf muscle was involved. Day-to-day activities have a great influence on the variations of working pressure in individuals using elastic stockings and so, the stockings are useful as an adjuvant form of therapy in patients with venolymphatic diseases.

Key words: Elastic Stockings, Working Pressure, Dynamic Study.

Introduction

The calf muscle pump is recognized as an integral component of effective venous return from the lower limbs 1.During dynamic exercise, the rhythmic contraction of the peripheral skeletal muscles results in the compression of the intramuscular veins, and imparts a considerable amount of kinetic energy to the venous blood and facilitates its return to the heart 2.

Early walking exercise is safe in patients with acute DVT and may help to reduce acute symptoms. Exercise training does not increase leg symptoms acutely in patients with a previous DVT and may help to prevent or improve the postthrombotic syndrome3.

In the activities daily life can develop activities with therapeutic purposes both from occupational and functional points of view. The muscle activities related to work can be used as a form of therapy when they are carefully analyzed and utilized for this purpose. Patients with lymphedema can utilize myolymphokinetic activities associated with stockings or bandages as part of their therapy 4,5. The current study dynamically evaluates the working pressure variations at the interface between stockings and the skin during varying activities.

Method

On 10 occasions the working pressures, that is, the variations between elastic stockings and the skin were evaluated during day-to-day activities. Three individuals, who were requested to continue carrying out their routine activities during the study, participated in the experiment. The 20/30 Sigvaris elastic stockings were used during the evaluation.

To measure the working pressures, an apparatus developed by Godoy & Braile in the Braile Biomedica Company, São José do Rio Preto, São Paulo, Brazil was

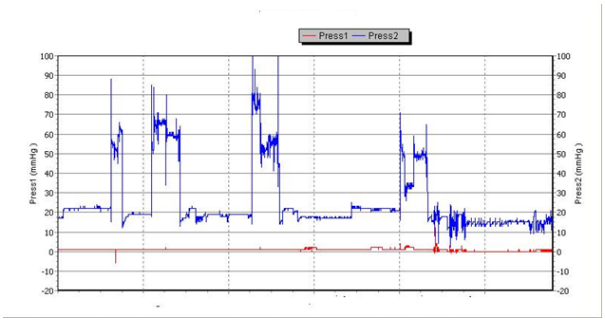
utilized. The apparatus was programmed to evaluate working pressures at half-second intervals, as a dynamic or static study. A pilot study was first performed to identify the best location to place the sensors and the medial region of the calf muscle was found to be most appropriate.

The individuals were monitored for periods varying from approximately one to three hours on each occasion and after completing data collection, the measurements were expressed as numbers at half-second intervals in the form of a graph. Several activities were performed including resting, walking, running and moving around the house. The study was approved by the Ethics Committee of Medical School of São Jose do Rio Preto-Brazil-FAMERP.

Results

A total of between 7300 and 22000 measurements of pressure were recorded during each event. Pressure variations were identified according to the muscle activity mainly when the calf muscle was used as can be seen in Figure1.

Figure 1: The variations in the working pressures of elastic stockings during daily activities



Discussion

The current study shows the importance of day-to-day activities which involve the musculature of limbs restricted by the use of elastic stockings. No studies have been previously published using this method however, these data are of fundamental importance to counsel patients on the use of everyday activities that cause variations in working pressures thereby contributing to venolymphatic return.

Elastic stockings, not only cause a constant pressure with few variations when the patient is still, but also trigger pulsating pressure variations, that is working pressures, during activities that cause movement of the musculature of the involved limbs.

We noticed that movements that utilize a greater impact of the musculature, such as for example running, cause greater working pressures. Thus, the identification of these activities should be made and the patients counseled in respect to their importance, as they can be used as part of the treatment program. It seems reasonable to suggest that the patient should try to perform activities that involve movement of the muscles for most of the time and avoid long periods of sitting or standing.

The degree of pressure exerted by stockings is another factor that interferes in working pressures. Further studies are required using dynamic evaluation methods for each activity identifying the most important actions in respect to working pressures and that the patients should be encouraged to perform these activities during their day-to-day life.

Conclusion

Day-to-day activities influence the working pressures of elastic stockings and for this they are useful as an additional form of treatment in patients with venolymphatic diseases.

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