

# Study of the relationship of vascular problems in the orthostatic position - municipal guard of the city of Rio de Janeiro - a proposal for personal protection equipment

## Abstract

This article discusses the etiology of Chronic Venous Insufficiency (CVI), with a study of the posture adopted by a group of workers (Municipal Guard), which can have medium- and long-term consequences, and which is so little discussed this kind of group. Through a literature review, it will be analyzed whether the position adopted during the work cycle is sitting or standing, for long periods can be a supporting factor in the etiology of the CVI.

**Keywords:** municipal guard, chronic venous insufficiency, orthostatic position

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## Introduction

In order to identify whether standing for long periods can cause or facilitate the appearance of venous insufficiency of the lower limbs, it is necessary to seek answers in the literature. According to information obtained from the website of the Brazilian Society of Angiology and Vascular Surgery (SBACV),<sup>1</sup> varicose veins are just one part, one stage of a much more complex disease called Chronic Venous Insufficiency (CVI). One of the most frequent diseases that affect the global and Brazilian population. Although there are several theories about it, we know that there are some risk factors for the development and worsening of the disease that can be easily identified. Some of these factors are modifiable and others are not.

Among the various factors that can contribute to the onset of the disease, we can highlight some of them, the subject of our discussion:

- I. Standing work<sup>1</sup>: professions that require long hours of standing are related to a higher incidence of varicose veins. There has been much debate as to whether standing alone is the cause of the appearance of varicose veins or whether this would only appear in those individuals who have damaged venous valves, thus being a supporting factor in the establishment of the disease. It is also worth noting that sitting for long periods can also be a contributing factor.<sup>2</sup>
- II. Women are the most affected. Between 2.5 and 3 cases of women with varicose veins are recorded for every man with the disease. The reason would be female hormones that reduce the strength (tone) of the vein walls, leaving the vessels weaker. Therefore, hormone replacement and contraceptive methods can help with the appearance of varicose veins. For the same reason, during pregnancy, the chances also increase and increase with each new pregnancy.<sup>3</sup>

It was observed in a study published in the *Jornal Vascular Brasileiro*,<sup>4</sup> which aimed to evaluate the occurrence of postural edema and verify whether there is a difference in its formation between two working postures adopted - standing and sitting. In this work, 16 traffic officer workers were evaluated, divided into two groups according to the working position adopted, both for more than four consecutive hours. Data were collected before and after the workday for three consecutive days.

The evaluation revealed the presence of postural edema of the lower limbs in both conditions evaluated.

When analyzing the difference in the formation of Postural Edema (PE) between the groups, a tendency was observed for greater formation in the Standing Group compared to the Sitting Group, however without a statistically significant difference. It was concluded that PE existed in traffic officers after four hours of work in the two conditions evaluated, with a predominance of edema formation when standing. In the work *Influence of the Work Shift on the Formation of Lower Limb Edema in Normal Individuals*, also published in the *Jornal Vascular Brasileiro*, whose objective was to evaluate the evolution of edema in normal individuals during different work shifts<sup>5</sup> of the 20 participants, 19 were female and 1 male, with no evidence of venous disease in the lower limbs, their conclusion being that the appearance of edema is a constant during work activities, even in people without manifest venous disease and is influenced by the work shift to which the worker is exposed.

## Physiopathogenesis

To try to explain the emergence of Lower Limb Varicose Veins, once again we will use a publication from the Brazilian Society of Angiology and Vascular Surgery,<sup>6</sup> from which it is extracted: "The veins of the legs are the vessels responsible for returning the blood

that irrigated the legs and the feet back to the heart. Our veins have valves, whose function is to prevent blood from returning to the feet, due to the force of gravity when we stand.

If these valves do not work well, the blood becomes “stuck” inside the veins, which dilate and become tortuous over time, overloading the circulation and causing symptoms related to varicose veins, such as a feeling of heaviness, pain and swelling in the legs and on the feet.

This is what doctors call stasis and chronic venous hypertension.” For Society,<sup>6</sup> what was previously mentioned regarding risk factors was observed, which would be:

- I. Family predisposition.
- II. Gender (women are more susceptible, due to the presence of female hormones that reduce the strength of the vein walls). Replacement therapy and hormonal contraceptive methods are factors that can cause varicose veins to appear earlier. For the same reason, during pregnancy, the chances also increase and increase with each new pregnancy;
- III. Age. The amount of collagen in the veins begins to decrease with age and, therefore, they tend to dilate more easily;
- IV. Incorrect habits (staying in the same position for a long time, whether standing or sitting, impairs blood circulation in the lower limbs). According to Caffaro et al.,<sup>7</sup> regarding forms of treatment and adding some prevention measures, the following can be pointed out:
  - I. Walking as much as possible during daily activities, as it better develops the muscles of the lower limb (calf) and activates venous return;
  - II. Do not remain still, or stand or sit, for prolonged periods, as pending immobility increases venocapillary pressure and, when forced to do so, move your legs frequently. The worst thing a patient with venous disease of the lower limbs can do is stand for long periods;
  - III. Avoid clothing that hinders venous return;
  - IV. Very high-heeled shoes alter the venous hemodynamics of the calf muscle pump and plantar region;
  - V. Combat obesity;
  - VI. Exercising with your legs above heart level is the best physiological method to reduce edema;
  - VII. Elevation of limbs;
  - VIII. Rest lying down with the foot of the bed elevated (15 cm above the heart), alternating with periods of walking;
  - IX. Sleep with a supported bed, which allows the part relating to the feet to be elevated;
  - X. Do not use pillows below the knees to avoid compressing the venous return there, and in more serious cases, rest should be longer.

### Specific legislation

Adding, as a preventive measure, State Regulation, as an example of collective measures we can mention NR 17 (Regulatory Standard).<sup>8</sup> This aims to establish parameters that allow the adaptation of working conditions to the psychophysiological characteristics of workers, in order to provide maximum comfort, safety and efficient performance and, in the case set out here more specifically in its sections:

17.3.5. For activities in which work must be carried out standing up, rest seats must be placed in places where they can be used by all workers during breaks.

17.6.3. In activities that require static or dynamic muscular overload of the neck, shoulders, back and upper and lower limbs, and based on the ergonomic analysis of the work, the following must be observed: rest breaks must be included; when the employee can rest with their feet elevated, facilitating venous return.

### Personal protective equipment

Regulatory standard 6 - NR 6

#### Personal protective equipment - EPI

6.1 For the purposes of applying this Regulatory Standard - NR, Personal Protective Equipment - PPE is considered to be any device or product, for individual use used by the worker, intended to protect against risks that may threaten safety and health at work.

6.4 Taking into account the peculiarities of each professional activity, and observing the provisions of item 6.3, the employer must provide workers with appropriate PPE, in accordance with the provisions of ANNEX I of this NR

#### Treatment methods - prophyllaxis

Lower limb compression (elastic stockings) is one of the most important therapies for patients with CVI and is therefore indicated in most cases. This type of treatment seeks to provide external support in various ways, in order to prevent the onset of edema or reduce its intensity. The main effects of compression are to increase tissue pressure associated with a decrease in vein lumen. The first action tends to increase venous and lymphatic drainage with improved microcirculation. The second action leads to an increase in the speed of venous return flow with a decrease in venous and capillary stasis, which is the main objective of treating Chronic Venous Insufficiency.

#### Municipal guard of the city of Rio de Janeiro (GM-RIO).

It is a municipal institution that operates in public security in Rio de Janeiro.

Linked to the Municipal Secretariat of Public Order (SMOP), it was created in 1993 to protect the citizen and act on the most varied fronts: in urban planning, in monitoring traffic and municipal attitudes, in the preservation of goods, services and facilities and in supporting Public Security actions. With 7,312 guards, GM-Rio maintains 35 operational units in the city, including 15 Inspectorates, 11 Public Order Units and nine Special Groups. The teams patrol on foot, with dogs, in vehicles, electric carts, bicycles and motorcycles. To monitor the city's daily life, the Municipal Guard carries out various security actions in municipal schools, beaches, squares, parks and the main tourist attractions in Rio. It is considered the largest unarmed Municipal Guard in the country and is a reference in operational actions.. It is known that to carry out the activities inherent to the role of Municipal Guard, participants must remain for several hours, either in a standing or sitting position, which, based on the lexicons already presented, are risk factors for the triggering CVI.

For a better understanding of the reader, we will present photos taken from the internet that demonstrate what is expressed here (publicly accessible photos).



It is worth highlighting, as demonstrated in the photographs above, the presence of females in this activity and, as already stated, gender is also a prevalent factor in the genesis of CVI.

### Concluding comments

From what has been exposed in this brief summary, remembering once again that this is not an article that aims to exhaust the subject, but only to pay attention to a reality, it can be concluded that the position adopted during the work cycle, whether sitting or standing for long periods may be a supporting factor in the etiology of CVI, that women are the population most susceptible to the onset of this

disease, that pregnancy and the use of contraceptives increase this risk factor, that combating obesity, elevating the lower limbs, and Using elastic compression stockings, such as PPE, can help prevent and treat CVI.

### Suggestions

This Expert, taking as a reference what was presented here, brings as a suggestion to state managers, regarding the Present Security program, that they institutionalize the use of elastic stockings as PPE, for both sexes, aiming at the prophylaxis of the installation of PVI, as well such as combating obesity.

### Conflicts of interest

The author declares there is no conflict of interest.

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