

# Venous insufficiency and sedentary job activity

SÓNIA MATEUS<sup>1</sup> , PATRÍCIA COELHO<sup>2</sup>, FRANCISCO RODRIGUES<sup>2</sup>

<sup>1</sup>Hospital Espírito Santos de Évora, Sport, Health & Exercise Unit (SHERU), Instituto Politécnico de Castelo Branco, Portugal

<sup>2</sup>Qualidade de Vida no Mundo Rural (QRural), Sport, Health & Exercise Unit (SHERU), Instituto Politécnico de Castelo Branco, Portugal

## ABSTRACT

In Europe venous insufficiency is a common pathology that affects 50% of women and 30% of men in working age, compromising their life quality, especially in daily tasks. Sedentary job activities may lead to the onset or worsening the disease. Evaluate the relationship between the presence of venous insufficiency and the type of postural position during a sedentary job activity. A cross-sectional observational study was carried out in 76 individuals of both sexes. One group had a sedentary job activity in a seated position (28 individuals) and the other had orthostatic position (46 individuals). The sample was collected within six months. The registry of information on risk factors and venous insufficiency according to the CEAP classification was carried out in a table prepared for this purpose. We obtained a sample of 44 women (58%) and 32 men (42%) with a mean age of 42.26 years + 9.74. According to the CEAP classification, venous insufficiency was present in 61.4% women ( $p = 0.001$ ) and the orthostatic position presents a higher average order in the classification ( $p = 0.005$ ). The sedentary job activity in orthostatic position contributes to a greater wear of the muscular pump, more easily conditioning the venous hemodynamic compromise. **Keywords:** Job; Sedentary; Venous insufficiency.



**Corresponding author.** Rua do Escoural nº16, Bairro dos Álamos 7005-426 Évora, Portugal.

E-mail: [soniamatildemateus@gmail.com](mailto:soniamatildemateus@gmail.com)

Supplementary Issue: Spring Conferences of Sports Science. International Seminar of Physical Education, Leisure and Health, 17-19 June 2019. Castelo Branco, Portugal.

JOURNAL OF HUMAN SPORT & EXERCISE ISSN 1988-5202

© Faculty of Education. University of Alicante.

doi:10.14198/jhse.2019.14.Proc4.82

## **INTRODUCTION**

The pathologies of the venous system present high incidence and prevalence, affecting individuals of different ages and in active age. Venous insufficiency (VI) consists in venous difficulty return to the heart, due to an imbalance between the forces that favour and oppose the return (França and Tavares, 2003). The venous system is a capacitance system that is divided into a deep and superficial venous system, and both are exposed to hydrostatic pressures found in the human vascular system in the orthostatic position (Santos and Bonamino, 2003).

## **MATERIAL AND METHODS**

Cross-sectional observational study performed through a representative sample of individuals with sedentary job activity in orthostatic or seated, which took place over six months. For all subjects researchers record information about job activity, the pathology clinical presence according to CEAP classification, blood pressure, glucose value and body mass index were evaluated. All individuals read and signed informed consent.

### ***Participants***

After we have used the inclusion criteria (individuals of both gender between 20 and 65 years old and sedentary job activity in orthostatic or seated position who are in the same job between 10 and 15 years, and who spend 8 hours in the same position), a sample was obtained with 76 individuals, 44 females (58%) and 32 males (42%) aged between 28 and 64 years and a mean of 42.26 years + 9.74. Of the total, 46 individuals reported job activity in orthostatic position and 28 in seated position.

### ***Measures***

The evaluation of the presence of the pathology and its clinical characterization was performed according to the CEAP classification (Leal and Mansilha, 2010). Blood pressure was measured according to the 2013 ESH / ESC guidelines (Mansia et al, 2013), the glucose value according to the American Diabetes Association (2018) and the calculation of body mass index according to DGS (2017).

### ***Procedures***

The application of CEAP classification was performed by experienced clinician and is divided into seven items. These are the clinical classification (C), etiological (E), anatomical (A) and pathophysiological (P) classification. (C0), telangiectasias / reticular veins (C1), varicose veins (C2), edema (C3), pigmentation or eczema (C4a), lipodermatosclerosis (C4b)), healed venous ulcer (C5) and finally active venous ulcer (C6). For blood pressure measurement a manual sphygmomanometer was used, to measure glucose we used a glucose monitor and On Call Plus test strips. To calculate the mass index, the weight and height were obtained. Information registration was carried out by the researchers in a table prepared for the purpose.

### ***Analysis***

Statistical analysis was performed using the statistical software program Statistical Package for the Social Sciences (IBM SPSS Statistics® version 22). A descriptive analysis of all variables was performed. The normal distribution of sample analysis the Kolmogorov-Smirnov test was performed, where it was verified that the body mass index and age variables follow a normal distribution.

Non-parametric Chi-Square and Mann-Whitney tests were used to relate the pathology with the individual's working position and associated risk factors.

## RESULTS

In the body mass index classification, most individuals had normal parameters. VI compromises mainly individuals with normal weight and overweight with a percentage of 20.78%, however, there is no statistically significant relation ( $p = 0.379$ ). There is a significant relationship between the presence of VI and non-modifiable risk factors such as female (61.4%) ( $p = 0.001$ ) and family history (67.6%) ( $p = 0.001$ ). According to the clinical classification of CEAP, individuals who have orthostatic as their job position are those with a higher average order ( $p = 0.005$ ). Concerning the development of job activities commitment the average order is higher in the orthostatic position, with a statistically significant difference ( $p = 0.005$ ).

## DISCUSSION

The high incidence and prevalence of venous system diseases affects individuals of different ages and is considered a public health problem (France, 2003). In Portugal, an epidemiological study showed that the prevalence of VI was higher in female subjects, reaching the majority of women between 55 and 64 years. This correlates with some demographic characteristics of our study, where the relationship between the presence of VI and risk factors such as sex and family history showed statistically significant differences ( $p = 0.001$  and  $p = 0.001$  respectively). According to Medeiros and Mansilha (2012) it is now known that age, family history and sex are factors that contribute to the development of VI. The fact that it is more frequent in the female sex may be a result of hormonal factors, but also because it is considered aesthetics matter being the sex that most seeks treatment. In this sample the presence of VI does not depend on the body mass index class. This fact is not in agreement with the literature and can be justified by the small number of observations. Currently, overweight is considered to impair blood changes due to increased adipose tissue, which increases blood stasis leading to the onset / worsening of the disease (Santos and Bonamino, 2009). Other risk factors such as hypertension and diabetes were studied without significant results.

According to the clinical classification of CEAP the individuals that presented a higher average order were those with orthostatic job position. According to Berenguer and Lins (2011) the maintenance of the orthostatic position, in 45% of the working time, is considered enough to provoke symptoms of fatigue and discomfort of the lower limbs, being the venous edema the first manifestation of the blood stasis. It can be said that edema is a very important factor in an individual life quality, causing discomfort, feeling of heavy legs, and can later evolve into VI (Belczak and Gody, 2008). This leads us to significant results ( $p = 0.005$ ) also in the relation between the commitment to the development of job activities in individuals with this type of position and higher ordering in the clinical classification of CEAP. According to Berenguer and Lins (2011) these job activities can lead to the appearance / aggravation of VI by making muscular work more exhausting. For good maintenance of orthostatic position, constant levels of muscle contraction are necessary, compressing the blood vessels, which will easily provoke their fatigue leading to a decrease in their quality of life (Medeiros and Mansilhas, 2012).

## CONCLUSIONS

Jobs performed in orthostatic position increase the influence of hydrostatic and gravitational pressure with muscle pump wear, hindering venous return, which can lead to VI, with a negative impact on quality of life.

## REFERENCES

- American Diabetes Association (2018). Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes—2018. *Diabetes Care* 2018 Jan; 41(Supplement 1): S13-S27. <https://doi.org/10.2337/dc18-s002>
- Belczak, C., Gody, J., Ramos, R., Oliveira, M., Belczak, S., Caffaro, R. (2008). Influência do turno laboral na formação de edema dos membros inferiores em indivíduos normais. *J Vasc Bras*. Vol 7, Nº3. <https://doi.org/10.1590/s1677-54492008000300007>
- Berenguer, F.A., Lins, D.A., Carvalho, S.C. (2011). Influência da posição ortostática na ocorrência de sintomas e sinais clínicos de venopatias de membros inferiores em trabalhadores de uma gráfica na cidade do Recife-PE. *Revista Brasileira Saúde ocupacional*. São Paulo. 36 (123): 153-161. <https://doi.org/10.1590/s0303-76572011000100016>
- Camolas, J., Gregório, M.J, Sousa, S.M., Graça, P. (2017). Obesidade: otimização da abordagem terapêutica no Serviço Nacional de Saúde. Programa Nacional para a Promoção da Alimentação Saudável. Direção-Geral de Saúde. <https://doi.org/10.11606/d.89.2017.tde-25092010-123402>
- França, L.H. and Tavares, V. (2003). Insuficiência Venosa Crônica. Uma atualização. Artigo de revisão *J VascBr*. Vol. 2, Nº4.
- Leal, J. e Mansilha, A. (2010). Como avaliar o impacto da doença venosa crônica na qualidade de vida. Artigo de revisão. *Angiologia e Cirurgia Vascular*. Vol. 6, Nº 4.
- Mansia, G., Robert, F., Krzysztof, N., Josep, R., Alberto, Z., Michael, B., Thierry, C., Renata, C., Guy, B., Anna, D., Maurizio, G., Diederick, E.G., Tiny, J., Paulus, K., Sverre, E.K., Ste'phane, L., Athanasios, J.M., Peter, M.N., Luis, M.R., Roland, E.S., Per, A.S., Peter, S., Margus, V., Bernard, W. and Faiez, Z.(2013).ESH/ESC Guidelines for the management of arterial hypertension. The Task Force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). *Journal of Hypertension*. 31:1281–1357. <https://doi.org/10.1201/b17072-61>
- Medeiros, J. and Mansilha, A. (2012). Estratégia Terapêutica na Doença Venosa Crônica. Artigo de revisão. *Angiologia e Cirurgia Vascular*. Vol. 8, Nº 3.
- Santos, P. and Bonamino, M. (2003). Efeitos Cardiovasculares Agudos da Exposição ao Ambiente Microgravitacional. *Arq Bras Cardiol*. Vol. 80, Nº1: 105-115. <https://doi.org/10.1590/s0066-782x2003000100012>
- Santos, R., Profírio, G.J., Pitta, G. (2009). A diferença na qualidade de vida de pacientes com doença venosa cnônica leve e grave. *J Vasc Bras* . Vol. 8, Nº 2. <https://doi.org/10.1590/s1677-54492009000200008>

