

Presence of overweight or obesity and factors associated with chronic venous disease in patients undergoing varicose vein surgery on the lower limbs

Presença de sobrepeso ou obesidade e fatores associados à doença venosa crônica em pacientes submetidos à cirurgia de varizes em membros inferiores

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Abstract

Introduction: Varicose disease in the lower limbs is a pathology with high prevalence in the population, and several factors are related to its appearance and evolution. **Objective:** To evaluate the association of changes in body composition with factors associated with chronic vascular disease (CVD) with lower limb varicose veins. **Methods:** This is a cross-sectional, prospective study with patients who underwent varicose vein surgery in a referral hospital, from May to November 2018. A semi-structured research instrument was used with questions that addressed factors associated with CVD. Pearson's chi-square and Fisher's exact tests were used for data analysis, in addition to the Kendall concordance test. **Results:** In total, 146 individuals were selected, 89% of whom were female, with a mean age of 48.89 years. The vast majority (76%) had a family history of venous disease, with no history of venous ulcers, individual and family venous thromboembolism, or previous surgery. In addition, more than 50% did not perform physical activity, and 65% were overweight or obese. When analyzed statistically, the factors did not differ between non-eutrophic and eutrophic individuals. The Kendall Agreement Test showed good correlations between the order of appearance of the factors among all groups studied. **Conclusions:** The most prevalent associated factors in the population studied were the presence of a family history of varicose veins in the lower limbs, female sex, and the presence of overweight / obesity. The presence of changes in body weight did not determine differences in the occurrence and appearance of the factors evaluated.

Keywords: varicose veins. associated factors. prevalence. varicose vein surgery.

Resumo

Introdução: A doença varicosa em membros inferiores é uma patologia de alta prevalência na população, e diversos fatores são relacionados com seu aparecimento e evolução. **Objetivo:** avaliar a associação da alteração na composição corporal a fatores associados à doença crônica vascular (DVC) com varizes de membros inferiores. **Métodos:** trata-se de estudo transversal, prospectivo, com pacientes submetidos à cirurgia de varizes de membros inferiores em hospital referência, no período de maio a novembro de 2018. Utilizou-se instrumento de pesquisa semiestruturado com questões que abordavam fatores associados a DVC. Para análise dos

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dados foram utilizados os testes qui-quadrado de Pearson e Teste Exato de Fisher, além do Teste de Concordância de Kendall. **Resultados:** Foram selecionados 146 indivíduos, dos quais 89% do sexo feminino, e com idade média de 48,89 anos. A grande maioria (76%) apresentava história familiar de doença venosa, não possuía história de úlceras venosas, tromboembolismo venoso individual e familiar ou cirurgias anteriores. Além disso, mais de 50% não realizava atividade física, e 65% encontravam-se em sobrepeso ou obesidade. Quando analisados estatisticamente, os fatores não diferiram entre não-eutróficos e eutróficos. O Teste de Concordância de Kendall mostrou boa correlação entre a ordem de aparecimento dos fatores entre todos os grupos estudados. **Conclusões:** Os fatores associados mais prevalentes na população estudada foram a presença de história familiar de varizes em membros inferiores, sexo feminino e presença de sobrepeso/obesidade. A presença de alteração do peso corporal não determinou diferenças na ocorrência e aparecimento dos fatores avaliados. **Palavras-chave:** varizes. fatores associados. prevalência. cirurgia de varizes.

Introduction

Chronic venous disorders range from simple, such as telangiectasias, reticular veins, varicose veins, leg edema, to more severe forms, with hyperpigmentation, dermatosclerosis, and ulcer formation. When the disorder has the presence of varices, edema, skin manifestations, and ulcers, it is denominated Chronic Venous Disease (CVD), characterized as the set of clinical manifestations caused by abnormality (reflux, obstruction, or both) of the peripheral venous system (superficial, deep, or both), most commonly in the lower limbs¹. Varicoses or varicose veins may be conceptualized as dilated, tortuous, and elongated superficial veins². Although CVD has a high prevalence worldwide, the incidence ranges widely depending on the factors considered. When the presence of lower limb varicose veins is taken into account, the worldwide prevalence ranges from less than 1 to 73% in women and from 2 to 56% in men³. An exclusive study of the Brazilian population estimated a prevalence of 47.6%, being 37.9% in men and 50.9% in women⁴.

Different factors related to CVD with varicose veins are described in the lower limbs, among them obesity, since obese people with varicose veins present more symptoms and a higher complication rate. The clinical diagnosis, investigation, imaging, and treatment of CVD with lower limb varicose veins in obese people present a number of challenges. The evidence base

underlying the medical, surgical, and endocrine management of the disease in obese people is limited, and this treatment may be associated with worse and higher risks when compared to non-obese patients^{5,6}.

Still in an exclusively Brazilian population, a recent study showed a significant correlation between body mass index (BMI) and clinical classes of chronic venous disease with lower limb varicose veins in women. The results also confirmed the negative impact of obesity on clinical severity in this disease⁷. Even more impacting data highlight that approximately half of the world population is a carrier of lower limb varices, reaching 50 to 55% of women and 40 to 50% of men when considering the milder forms of varicose disease (telangiectasias and reticular varices). With respect to the more calibrous varices that are prominent on the skin, the disease affects less than 25% of the population, reaching 20 to 25% of women and 10 to 15% of men⁸.

Thus, the purpose of the current study is to evaluate whether the BMI variable below 25 kg/m² (eutrophic) and above 25 kg/m² (non-eutrophic) is preponderant to differentiate factors associated with CVD in patients admitted for varicose vein surgery in a referral hospital.

Materials and Methods

Sample and type of study

An epidemiological, observational, descriptive, and exploratory cross-sectional

study was carried out, with a convenience sample composed of patients admitted for varicose vein surgery in the Santa Casa de Misericórdia de Santo Amaro/São Paulo - SP, Brazil.

Research design

Data collection was conducted from November 2018 to May 2019. The patients selected for participation were interviewed and submitted to clinical evaluation by an experienced physician. All patients agreed to participate and signed the Informed Consent Form (ICF). The present research was approved by the ethics and research committees of the institutions involved.

Inclusion and Exclusion Criteria

Patients who were conscious and organized at the time of the interview were included in the study. Patients who did not present adequate clinical conditions to answer the research instruments (such as mental confusion) or who started participation and then dropped out were excluded.

Procedures

At the time of data collection, considering the possibility of a reduced level of understanding of the instructions on how to complete the scales due to inherent limitations and/or the patient's hospitalization situation, the researcher decided to read the instructions aloud, as well as each of the questions and their response alternatives. The semi-structured survey instrument contained questions about sociodemographic and socioeconomic characteristics and associated factors (family history; physical activity; orthostasis; relapse; use of phlebotonics; use of compression stockings;

presence of varicose ulcer; thromboembolic events; venous thromboembolism in the family; hospitalizations for CVD complications; and smoking).

For classification between eutrophic and non-eutrophic participants, weight and height were measured on Welmy mechanical anthropometric scales. These values were used to calculate the body mass index (BMI) according to the formula: $BMI = [weight/height^2]$. Subsequently, the participants were divided into a eutrophic group with a BMI below 25 kg/m², and non-eutrophic with a BMI equal to or above this value.

Statistical analysis was performed with a significance level of 0.05 or 5%, using the chi-square test, but when the expected frequencies were low (less than 5), and this test was not appropriate, we chose to use the Fisher's exact test. The objective was to compare the eutrophic and non-eutrophic groups in relation to the presence or absence of associated factors.

Kendall's concordance test was employed with the purpose of studying the concordances between the orders of males and females, eutrophic, or non-eutrophic, in decreasing order of percentage frequency of the associated factors. Again, the significance level for this test was 0.05 or 5.0%.

Results

We selected 146 individuals who underwent lower limb varicose vein surgery in the period from November 1, 2018 to May 31, 2019. Table 1 shows the sample characteristics of the included patients, considering the eutrophic and non-eutrophic groups.

Table 1 - Sample characteristics.

Variable	Non-eutrophic BMI >25 N=95	Eutrophic BMI <25 N=51
Age	49.02 ± 11.35	48.62 ± 12.18
Monthly income	R\$1472.88 ± 601.96	R\$1750.23 ± 971.18

N=number of subjects.

Among the selected patients, there were no exclusions, as all met the eligibility criteria for the present study. Among the participants, 130 were women, corresponding to 89% of the sample. Table 2 shows the analyses of the variables investigated (Family history; Physical

activity; Orthostatism; Relapse; Use of phlebotonics; Use of compression stockings; Presence of varicose ulcer; Thromboembolic events; Venous thromboembolism in the family; Hospitalizations for CVD complications; and Smoking).

Table 2 - Comparison between BMI >25 and BMI<25 groups, considering the variables: Family history; Physical activity; Orthostatism; Relapse; Phlebotonic use; Use of compression stockings; Presence of varicose ulcer; Thromboembolic events; Venous thromboembolism in the family; Hospitalizations for CVD complications; and Smoking.

Variable		Yes	No	Total	%	P
1- FAMILY HISTORY	BMI >25	74	21	95	77.9	0.3288
	BMI <25	36	15	51	70.6	
	Total	110	36	146	75.6	
2 - PHYSICAL ACTIVITY	BMI >25	38	57	95	40.0	0.7134
	BMI <25	22	29	51	43.1	
	Total	60	86	146	41.1	
3 - ORTHOSTASIS	BMI >25	40	55	95	42.1	0.08
	BMI <25	29	22	51	56.9	
	Total	69	77	146	47.3	
4 - RECIDIVAL	BMI >25	27	68	95	28.4	0.5242
	BMI <25	12	39	51	23.5	
	Total	39	107	146	26.7	
5 - USE OF PHLEBOTONICS	BMI >25	11	84	95	11.6	0.7434
	BMI <25	5	46	51	9.8	
	Total	16	130	146	11	
6- USE OF COMPRESSION STOCKINGS	BMI >25	27	68	95	28.4	0.8997
	BMI <25	15	36	51	29.4	
	Total	42	104	146	28.8	
7- PRESENCE OF VARICOSE ULCER	BMI >25	10	85	95	10.5	0.3867
	BMI <25	3	48	51	5.9	
	Total	13	133	146	8.9	
8 - THROMBOEMBOLIC EVENTS	BMI >25	11	84	95	14.7	0.3799
	BMI <25	3	48	51	13.7	
	Total	14	132	146	14.4	
9 - VENOUS THROMBOEMBOLISM IN THE FAMILY	BMI >25	14	81	95	14.7	0.8681
	BMI <25	7	44	51	13.7	
	Total	21	125	146	14.4	
10 - HOSPITALIZATIONS DUE TO COMPLICATIONS OF	BMI >25	2	93	95	2.1	0.5423
	BMI <25	0	51	51	0	
	Total	2	144	146	1.4	

11 - SMOKING	BMI >25	39	56	95		
	BMI <25	17	34	51	40.0	0.3605
	Total	56	90	146	41.1	

Where one reads: F= female; M= male; BMI: Body mass index; %: Percent; p= p value.

None of the variables analyzed showed a significant association between eutrophic and non-eutrophic individuals and factors associated with CVD with lower limb varices ($p > 0.05$).

Discussion

Epidemiological studies on lower limb varicose disease in Brazil and worldwide show a wide prevalence, ranging from 20 to 70% in the adult population⁹. However, there are controversies about the relationship between body weight and varicose disease^{10,11}, and other studies mention obesity only as a factor that increases the risk of disease complications¹²⁻¹⁴. Lower limb venous disease and obesity are increasingly common. Thus, an increase in the number of obese patients with lower limb venous disease is expected in the coming years, and physicians in other specialties will treat a wide range of obesity-related health problems in people with or at risk for lower limb venous disease. As such, many basic questions remain unanswered and there is an urgent need for research in this challenging and increasingly prevalent patient group¹⁵.

A recent study in India, despite citing the controversies about obesity and varicose veins, showed a positive relationship for morbid obesity and lower limb venous disease. The high prevalence of varicose veins in the lower limbs and the increase in overweight and obesity in the world population, besides the controversies regarding the association between these pathologies, led to the evaluation of the

other factors studied among individuals with normal and altered BMI.

In the current study, we observed a large difference between the number of women who underwent the surgical procedure, almost 90%, in relation to the number of men for the same procedure. It can be inferred that the increased incidence in women is a factor that determines this disparity of values in patients undergoing surgery, but it also raises reflections on the reasons, which are probably related to the reduced number of men who undergo the same procedure.

Patient age is considered an associated factor in most studies, and varicose vein surgery is more prevalent in individuals between 30 and 60 years of age, in both sexes^{16,17}. The life expectancy of the world population is increasing, due to a number of factors, leading to increases in the number of patients with CVD. The severity and complications of the disease also progress with the increasing age of the patient¹⁸.

Among the patients who underwent surgery at Santa Casa de Misericórdia de Santo Amaro/São Paulo - SP, Brazil, we found results compatible with almost all studies, with a mean age of the evaluated patients of 48 years, ranging from 30 to 60 years.

A family history of varicose veins was observed in 78% of the interviewees, which may suggest a probable association between the presence of lower limb varices and the genetic condition of the individual, corroborating the majority of studies found in the medical literature. The present study, however, was limited to questioning the presence or not of a family history of

varicose veins, as we were not able to perform a genetic evaluation of the studied population.

Another important variable to be mentioned is the presence or not of sedentarism among the individuals selected for this study. Sedentarism is pointed out as a public health problem all over the world. It is postulated that the reasons that lead to a sedentary lifestyle are a lack of knowledge about how to exercise and the purposes of each exercise, the limitations of some population groups, and the distorted perceptions regarding the benefits of movement¹⁹. It was observed that almost 60% of the participants interviewed did not perform any type of physical activity. The literature clearly reports that exercise performed with load is capable of producing beneficial effects on the neuromuscular system²⁰.

Considering the factors included in this study (family history of varicose veins, sedentariness, presence of orthostasis for more than eight hours a day at work, varicose vein recurrence, use of phlebotonics, use of elastic compression stockings, history of varicose ulcers, presence of individual and family history of venous thromboembolism, hospitalizations due to CVD complications, and smoking), there were no differences regarding their presence when individuals were evaluated according to BMI. No statistical differences were observed for any factors considering the percentage of presence between individuals who were eutrophic and those who were overweight or obese. The only factor that suggested a greater presence in eutrophic individuals was orthostasis for more than eight hours a day.

An agreement was verified between the order of men and women with BMI lower and higher (or equal) than 25 kg/m², in decreasing order of percentage frequency of the factors, i.e., from the highest to the lowest, with no differences observed in the order of appearance of the factors in any of the groups studied. If there was total

agreement, that is, if the orders totally coincided, the agreement coefficient would be 1.00, or 100%. In the study in question, this coefficient was 0.89, or 89% agreement.

It is worth pointing out that the sample analyzed refers to patients selected for varicose vein surgery in the hospital where the research was carried out through systematic sampling, therefore it does not represent the general population of people in Brazil, for example, who are undergoing hospital admission and surgery. It is important to consider that the fact that the researchers read the instructions, questions, and response alternatives of the self-completion scales may have generated some kind of information bias in the results presented. Furthermore, the division between the analysis groups into only two groups may represent a limitation of the study, as the participants with a BMI classified as overweight (BMI between 25 kg/m² and 30 kg/m²) could actually be a transition group, approximating the results between the eutrophic individuals and those who present obesity.

Conclusion

We conclude that the presence of overweight or obesity (non-eutrophic and eutrophic) is not associated with CVD. However, the presence or absence of overweight/obesity does not seem to be associated with variables that are related to CVD (family history, sedentary lifestyle, orthostasis for more than eight hours a day, varicose vein recurrence, use of varicose vein medication, use of elastic compression stockings, existence of varicose ulcer, family history of VTE, hospitalizations for CVD complications, and smoking). The evaluation of factors related to lower limb venous pathology should be further evaluated in epidemiological studies in the medical literature.

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