ISSN: 0975-3583,0976-2833 VOL14, ISSUE 08, 2023

To Determine the Prevalence and Identify the Risk Factors Associated with Varicose Veins, Skin Trophic Changes, And Venous Symptoms Among Patients Seeking Treatment at A Tertiary Care Hospital in Northern India

Mohit Bhatnagar[1], Atul Agarwal[2], Ashutosh Sanga[3]

[1]Associate Professor, Department of General Surgery, Venkateshwara Institute of Medical Sciences, NH-24, Jyotiba Phule Nagar, Uttar Pradesh, India.
[2]Associate Professor, Department of General Surgery, Venkateshwara Institute of Medical Sciences, NH-24, Jyotiba Phule Nagar, Uttar Pradesh, India.
[3]Assistant Professor, Department of General Surgery, Venkateshwara Institute of Medical Sciences, NH-24, Jyotiba Phule Nagar, Uttar Pradesh, India.

Abstract

Background: Chronic venous disorders have emerged as a significant global health concern, contributing to a substantial burden of disease and disability on a global scale. These disorders are associated with significant medical and economic ramifications. The societal cost is also substantial. Despite the significant severity of the issue, there has been a noticeable lack of substantial endeavors to effectively mitigate and prevent these persistent disorders. **Aim:** To determine the prevalence and identify the risk factors associated with varicose veins, skin trophic changes, and venous symptoms among patients seeking treatment at a tertiary care hospital in northern India. **Material and Methods:** The inclusion criteria for this study encompassed individuals who were 18 years of age or older, met the specified sampling frame, and expressed a willingness to participate. A cohort of 600 eligible study participants was contacted and subsequently interviewed. The senior resident of the surgery department conducted a comprehensive assessment of varicose veins, edema, and skin trophic changes in the lower extremities as a component of a standardized examination. A comprehensive investigation was conducted regarding the venous symptoms, skin trophic changes, history of thromboembolic disease, family history of varicose veins, exercise activities, occupation, and other relevant factors. **Results:** Among the participants, 277 females (46.17%) and 122 males (20.33%) were identified as having varicose veins. Additionally, 300 females (50%) and 115 males (19.17%) exhibited venous symptoms. Trophic changes in the skin were observed in 110 (18.33%) females and 33 (5.5%) males, respectively. The age (OR 1.11, p=0.001), a history of thromboembolic disease (OR 4.51, p=0.06), and the presence of pitting edema (OR 6.85, p=0.03) are three statistically significant risk factors associated with skin trophic changes in individuals with varicose veins. **Conclusion:** It was determined that there was a significant prevalence of chronic venous disorders in the lower limbs among the residents of the region under investigation.

Keywords: Varicose veins, Skin trophic, Venous symptoms.

Corresponding Author: Dr. Mohit Bhatnagar, Associate Professor, Department of General Surgery, Venkateshwara Institute of Medical Sciences, NH-24, Jyotiba Phule Nagar, Uttar Pradesh, India.

Introduction

The venous system plays a crucial role in the circulatory network due to its capacity to constrict and dilate, store significant quantities of blood for redistribution, and regulate cardiac output.[1] Varicose veins are characterized by the abnormal swelling, dilation, and tortuosity of subcutaneous veins. In 1994, the American Venous Forum formulated an elaborate descriptive classification system for chronic venous disorders, which subsequently received publication in

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 08, 2023

25 journals and books. The classification system relied upon clinical manifestations, etiological factors, the anatomical distribution of disease, and underlying pathophysiological findings. The publication of the advanced CEAP classification system occurred in 2004.[1,2] The etiology of varicose veins remains incompletely comprehended, as the presence of varicose veins may arise from either primary venous disease or inherent morphological or biochemical irregularities within the venous wall. Varicosities may also arise due to secondary factors, including prior occurrences of deep vein thrombosis (DVT), obstructions in deep veins, superficial thrombophlebitis, or arteriovenous fistula. Varicose veins can also manifest as venous malformations, which may have a congenital origin. According to research findings, the prevalence of varicose veins tends to rise as individuals grow older, with a particularly higher occurrence observed among females and individuals with a familial predisposition to varicose veins. Varicose veins are regarded as potential risk factors, particularly in women, for individuals who are obese, engage in smoking, and experience prolonged periods of standing during their occupation.[3-5] Chronic venous disorders have the potential to cause various skin trophic changes, including pigmented dermatitis, lipodermatosclerosis, white atrophy, and leg ulcers. Additionally, individuals may experience pitting ankle edema and symptoms associated with venous dysfunction, such as aching, pain, congestion, skin irritation, muscle cramps, heaviness, tension, sensations of swelling, and itching. These disorders are associated with significant medical and economic implications. The societal cost is also substantial. Despite the significant importance of the issue, there has been a lack of substantial endeavor to effectively mitigate these persistent disorders.[6-8] The understanding of the pathogenesis and natural progression of chronic venous disorders is currently limited, likely due to its complex etiology, which poses challenges in identifying the primary causative factors. The pathophysiology of the venous system, as observed from a hemodynamic perspective, has been found to be associated with the development of varicose veins and skin trophic changes due to valvular dysfunction in superficial, deep, and perforating veins.[9,10] The epidemiologic approach is considered the most effective means of comprehending physiopathological issues. Community or population-based studies tend to produce more robust and reliable findings. To the best of our knowledge, no community-based study has been conducted in this region thus far. Therefore, the lack of existing literature justifies the need for conducting this survey. Consequently, the present study was designed with the aim of analyzing and determining the prevalence and risk factors associated with varicose veins, skin trophic changes, and venous symptoms within the tertiary care hospital in north Indian.

Methodology

The current study was conducted in a tertiary care hospital from July 2022 to April 2023. The inclusion criteria for this study encompassed individuals who were 18 years of age or older, met the specified sampling frame, and expressed a willingness to participate. A cohort of 600 eligible study participants was contacted and subsequently interviewed. In the context of this research, varicose veins were operationally defined as dilated, convoluted veins located beneath the skin, which can be observed or felt by a clinician while the patient is in an upright position. Information was collected regarding symptoms related to veins, as well as the medical history and treatments associated with venous diseases. In addition, socio-demographic information was collected. The senior resident of the surgery department conducted a comprehensive assessment of varicose veins, edema, and skin trophic changes in the lower extremities as a component of a standardized examination. An ultrasound examination was not conducted. A comprehensive investigation was conducted regarding the venous symptoms, skin trophic changes, history of thromboembolic disease, family history of varicose veins, exercise activities, occupation, and other relevant factors. The study followed the principles outlined in the Declaration of Helsinki regarding research involving human subjects. Patients

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provided informed consent following a comprehensive discussion regarding the benefits and potential risks associated with their participation. Prior to the initiation of the study, approval was obtained from the Institutional Ethics Committee (IEC). The questionnaires underwent a thorough manual review and editing process to ensure their completeness and consistency. Subsequently, they were coded in preparation for computerized data entry. Following the compilation of gathered data, statistical analysis was conducted utilizing the Statistical Package for the Social Sciences (SPSS), version 25.0, developed by IBM in Chicago, USA. The findings were presented utilizing suitable statistical techniques.

RESULTS

Table 1 displays the prevalence of varicose veins in the study population. Among the participants, 277 females (46.17%) and 122 males (20.33%) were identified as having varicose veins. Additionally, 300 females (50%) and 115 males (19.17%) exhibited venous symptoms. Trophic changes in the skin were observed in 110 (18.33%) females and 33 (5.5%) males, respectively. Table 2 demonstrates that the presence of varicose veins in immediate family members (OR 4.06, p=0.03) and advancing age (OR 1.12, p=0.03) were identified as statistically significant risk factors for both males and females. The presence of varicose veins in females was found to have a positive association with the number of pregnancies (odds ratio [OR] = 1.77, p = 0.02). Among males, there was a statistically significant association (odds ratio [OR] 1.55, p=0.03) between engaging in unskilled work and an increased risk for varicose veins. Table 3 presents the results indicating that varicose veins (OR 2.15, p=0.03), a history of thromboembolic disease (OR 3.19, p=0.02), and prolonged standing (OR 1.62, p=0.04) were identified as statistically significant risk factors for venous symptoms in both males and females. Among females, there was a positive association (OR 1.23, p=0.03) observed between age and the occurrence of venous symptoms, as indicated in Table 3. The findings presented in Table 4 demonstrate that age (OR 1.11, p=0.001), a history of thromboembolic disease (OR 4.51, p=0.06), and the presence of pitting edema (OR 6.85, p=0.03) are three statistically significant risk factors associated with skin trophic changes in individuals with varicose veins.

Table 1: Prevalence of chronic venous disorders of lower limbs among study subjects

Types of chronic venous disorders	Male	Female	Total=600	Percentage
Varicose veins	122(20.33%)	277(46.17%)	399	66.5
Venous symptoms	115 (19.17%)	300 (50%)	415	69.17
Skin trophic changes	33 (5.5%)	110 (18.33%)	143	23.83

Table 2: Risk factors for varicose veins

Risk factors	Odds ratio (C.I. (95%)	P value
Risk factors among females		
Age	1.12(1.11-1.23	0.03
Unskilled work	1.15(1.09-1.34)	0.18
Exercise less than once a week	1.01(0.89-1.22)	0.26
Obesity	1.33(1.09-1.44)	0.04
Family history of varicose veins in first-degree relatives	4.06(2.55-5.29)	0.03
History of thromboembolic disease	1.99(1.85-2.61)	0.29
Equal to or more than 1 pregnancies	1.77(1.66-2.61)	0.02
Prolonged standing	1.52(1.29-1.97)	0.52
Risk factors among males		

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Age	1.12(0.98-1.44)	0.02
Prolonged standing	1.75(1.36-2.11)	0.25
Unskilled work	1.55(1.33-1.96)	0.03
Obesity	1.11(0.87-1.26)	0.42
Family history of varicose veins in first-degree relatives	3.58(2.55-4.69)	0.03
History of thromboembolic disease	169(1.25-2.99)	0.52

Table 3: Risk factors for venous symptoms

Risk factors	**Odds ratio (C.I. (95%)**	**P value**
Risk factors among females		
Age	1.23(0.99-1.65)	0.03
Unskilled work	0.87(0.69-1.34)	0.62
Exercise less than once a week	1.06(0.82-1.66)	0.41
Obesity	1.17(0.89-1.55)	0.23
Varicose veins	2.15(1.89-3.69)	0.03
Family history of varicose veins in first-degree relatives	1.63(1.22-3.12)	0.25
History of thromboembolic disease	3.19(2.25-4.61)	0.02
Equal to or more than 1 pregnancies	1.22(0.99-1.94)	0.26
Prolonged standing	1.62(0.87-1.94)	0.04
Risk factors among males		
Age	1.22(0.87-1.33)	0.19
Prolonged standing	3.22(2.59-4.16)	0.03
Unskilled work	0.98(0.88-1.37)	0.47
Obesity	1.34(1.13-2.16)	0.24
Varicose veins	3.26(1.99-4.19)	0.01
Family history of varicose veins in first-degree relatives	1.81(1.58-2.37)	0.23
History of thromboembolic disease	3.89(2.19-4.33)	0.02

Table 4: Risk factors for skin trophic changes

Risk factors for skin trophic changes	**Odds Ratio**	**P value**
Age	1.11(0.81-1.54)	0.001
Unskilled work	1.09(0.94-1.66)	0.69
Venous symptoms	1.64(1.34-2.66)	0.47
History of thromboembolic disease	4.51(3.58-5.61)	0.06
Family history of varicose veins in first-degree relatives	2.89(2.11-3.47)	0.02
Prolonged standing	1.34(1.22-1.92)	0.25
Obesity	1.21(0.86-1.59)	0.19
Pitting edema	6.85(5.51-7.56)	0.03

DISCUSSION

After conducting a thorough search, it was discovered that there is a scarcity of studies that have examined the prevalence and risk factors related to varicose veins on a global and local scale. Furthermore, the majority of these studies were conducted several decades ago or were limited in their scope, as they primarily focused on specific occupational groups rather than

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 08, 2023

estimating the prevalence of varicose veins in a larger population.[11] Our study revealed a high prevalence of varicose veins. The study found that 277 females (46.17%) and 122 males (20.33%) had varicose veins, while 300 females (50%) and 115 males (19.17%) experienced venous symptoms. Trophic changes in the skin were observed in 110 (18.33%) females and 33 (5.5%) males, respectively. Nevertheless, the data obtained from this study exhibited comparable outcomes to the existing body of evidence, indicating that nearly half of the participants in the study sample presented with varicose veins.[12,13] In a study conducted by Bawakid et al. (year) in the cities of Makah, Jeddah, and Dammam, the researchers found that the prevalence of chronic venous insufficiency was 45.6% among both male and female participants.[14] Furthermore, a cross-sectional study was carried out in primary health care centers located in the Qassim region of Saudi Arabia. The study revealed that the occurrence rate of varicose veins among both males and females was recorded at 61.1%.[15] A recent study conducted in the Republic of Korea utilized a questionnaire-based approach combined with Doppler ultrasonography to examine the prevalence of varicose veins among female nurses. The findings of this study revealed a lower prevalence rate of varicose veins, specifically 16.18%. This observation may be attributed to lifestyle modifications and improvements in healthcare accessibility. The study area exhibits a notable incidence of varicose veins. Elevated statistics have also been documented in the United States, London, and Japan.[17-19] While there were observed discrepancies that can be attributed to the criteria employed in defining varicose veins and the age ranges of the populations under study.

Our study revealed statistically significant differences in the prevalence of varicose veins between males and females, with a higher prevalence observed among females. The findings of this study are consistent with a prior study conducted in France.[20] In contrast to a separate study conducted in Edinburgh, which reported a higher prevalence among males, the current study presents differing findings.[21] The aforementioned studies were conducted several decades ago. Since then, it is possible that lifestyle changes have transpired, potentially resulting in diminished disparities in environmental factors impacting both genders.[22] This study identified age as a significant and important risk factor for varicose veins in both males and females. These findings are consistent with previous studies.[23] Our study found that a strong risk factor for varicose veins is a family history of the condition in first-degree relatives. The present finding is derived from data provided by the participants, yet it corroborates a prior investigation that relied on clinical assessments of family members.[24] The study revealed that pregnancy was a notable risk factor. Additional studies are also consistent with our observations.[25,26] This study observed that the absence of physical activity and engagement in low-skilled occupations were notable risk factors. Regular physical activity enhances the muscular pump function of the venous system, thereby mitigating the risk of developing varicose veins. Hobson's study on working populations yielded comparable results.[27] In our study, obesity/overweight was not determined to be a statistically significant risk factor of significant importance. This finding stands in opposition to the research conducted in Jerusalem.[28]

In the present study, we conducted observations and found that a history of thromboembolic disease was one of the three significant risk factors for the development of venous symptoms and skin trophic changes in individuals with varicose veins. Other studies have reported similar findings regarding the occurrence of skin trophic changes, specifically in relation to leg ulcers and their significant association with advancing age.[29,30] As anticipated, our study reveals that the presence of pitting edema is associated with an increased risk of developing venous symptoms and skin trophic changes. The observed clinical manifestations can be attributed to an elevation in interstitial fluid volume.

CONCLUSION

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It was determined that there was a significant prevalence of chronic venous disorders in the lower limbs among the residents of the region under investigation. Additionally, these disorders result in significant indirect costs incurred by individuals due to the medical and economic consequences they entail. The findings of this study necessitate the implementation of strategic planning and proactive measures to effectively mitigate the occurrence of these chronic disorders.

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