



ASSOCIATION OF OCCUPATION AND LIFESTYLE FACTORS WITH VARICOSE VEINS: A PROSPECTIVE OBSERVATIONAL STUDY

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Abstract

Background: Varicose veins represent a common chronic venous disorder with multifactorial etiology involving occupational and lifestyle determinants. This study aimed to evaluate the association between occupation, obesity, and lifestyle factors with the prevalence of varicose veins.

Methods: A prospective observational study was conducted over one year (2017–2018) among 200 adult patients attending a vascular clinic in Hyderabad. Data regarding occupation (prolonged standing vs non-standing), body mass index (BMI), physical activity, smoking, and comorbidities were collected. Clinical diagnosis of varicose veins was confirmed using duplex ultrasonography. Statistical analysis included Chi-square test and logistic regression, with $p < 0.05$ considered significant.

Results: Among 200 participants, 92 (46%) had clinically significant varicose veins. A significantly higher prevalence was observed in individuals with occupations involving prolonged standing (62.3%) compared to sedentary occupations (29.4%) ($p < 0.001$). Obesity ($\text{BMI} \geq 30 \text{ kg/m}^2$) was strongly associated with varicose veins (OR 2.8, 95% CI 1.6–4.9). Sedentary lifestyle and smoking also showed moderate associations.

Conclusion: Obesity and occupations requiring prolonged standing significantly increase the risk of varicose veins. Lifestyle modification and occupational health interventions are essential for prevention.

Keywords : Varicose veins; Occupation; Obesity; Lifestyle factors; Chronic venous insufficiency

Introduction

Varicose veins are a common manifestation of chronic venous disease (CVD), characterized by dilated, tortuous superficial veins resulting from venous valve incompetence and sustained venous hypertension [1]. The underlying mechanism involves structural and functional alterations in the venous wall and valves, leading to reflux, venous stasis, and progressive venous insufficiency [2]. Chronic venous disease encompasses a spectrum ranging from asymptomatic telangiectasia to advanced stages such as venous ulcers, significantly affecting quality of life and healthcare burden [3]. Epidemiological studies have reported a wide variation in the prevalence of varicose veins, ranging from 10% to 40% in the general population, depending on demographic and occupational

factors [4,5]. Classic population-based studies have consistently demonstrated that increasing age, female gender, and hereditary predisposition are key non-modifiable risk factors [6]. However, modifiable risk factors, particularly occupation and lifestyle-related determinants, have gained increasing attention due to their potential role in prevention. Occupational exposure, especially prolonged standing, has been identified as a major contributing factor in the development of varicose veins. Prolonged orthostatic posture leads to increased hydrostatic pressure in the lower limb veins, impairing venous return and promoting valve dysfunction [7]. Early occupational studies demonstrated significantly higher prevalence among workers engaged in standing professions such as teachers, factory workers, and healthcare personnel [8]. Conversely, sedentary occupations may also contribute by reducing calf muscle pump activity, thereby exacerbating venous stasis. Obesity is another important modifiable risk factor, contributing to increased intra-abdominal pressure and venous hypertension, thereby accelerating the development of venous insufficiency [9]. Additionally, lifestyle factors such as physical inactivity and smoking have been implicated in the progression of venous disease through their effects on vascular integrity and circulation [10]. Despite extensive global research, there is limited region-specific data evaluating the combined impact of occupational and lifestyle factors on varicose veins in the Indian population. Therefore, this study was undertaken to assess the association between occupation, obesity, and lifestyle determinants with the occurrence of varicose veins in a tertiary care setting.

Materials and Methods

This prospective observational study was conducted at Vascular Care Center, Hyderabad, over a period of one year (January 2017 to December 2018). A total of 200 adult patients aged 18–65 years attending the outpatient department were included. Ethical approval was obtained from the institutional review board, and informed consent was secured from all participants.

Inclusion criteria comprised patients presenting with lower limb symptoms suggestive of venous disease, including pain, heaviness, swelling, or visible dilated veins. Exclusion criteria included patients with deep vein thrombosis, previous venous surgery, pregnancy, and systemic illnesses affecting mobility.

Data collection included demographic variables, occupational history (classified into prolonged standing ≥ 6 hours/day vs non-standing), body mass index (BMI), physical activity levels, smoking status, and comorbidities. BMI was categorized as normal (< 25 kg/m²), overweight (25–29.9 kg/m²), and obese (≥ 30 kg/m²).

Clinical examination was followed by duplex ultrasonography to confirm diagnosis and assess venous reflux. Varicose veins were classified according to CEAP classification.

Statistical analysis was performed using SPSS version 22.0. Categorical variables were analyzed using Chi-square test, and odds ratios (OR) with 95% confidence intervals were calculated. Multivariate logistic regression was used to identify independent predictors. A p-value < 0.05 was considered statistically significant.

Results

Table 1. Demographic Characteristics (n=200)

The study population comprised 200 participants, with a higher proportion in the 30–50 years age group (52%). Males constituted 58% of the sample. Varicose veins were more prevalent among individuals aged > 40 years (55.4%) compared to younger individuals (34.6%). The gender distribution showed a slightly higher prevalence in males (48.3%) compared to females (43.1%), although this difference was not statistically significant ($p=0.41$).

Variable	Category	n (%)	Varicose Veins n (%)
Age	<40 years	92 (46%)	32 (34.6%)
	≥ 40 years	108 (54%)	60 (55.4%)
Gender	Male	116 (58%)	56 (48.3%)

	Female	84 (42%)	36 (43.1%)
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Table 2. Occupational Risk Factors

Occupational exposure showed a strong association with varicose veins. Individuals engaged in prolonged standing occupations (≥ 6 hours/day) had significantly higher prevalence (62.3%) compared to those in sedentary occupations (29.4%) ($p < 0.001$). This indicates that occupational posture plays a critical role in venous hemodynamics and supports the hypothesis that prolonged standing increases venous pressure and risk of venous insufficiency.

Occupation Type	Total (n)	Varicose Veins n (%)	p-value
Standing	98	61 (62.3%)	< 0.001
Non-standing	102	30 (29.4%)	

Table 3. BMI and Varicose Veins

A significant association was observed between BMI and varicose veins. Obese individuals (BMI ≥ 30 kg/m²) demonstrated the highest prevalence (68.4%), followed by overweight individuals (45.2%) and normal BMI participants (28.6%) ($p < 0.001$). The odds ratio for obesity was 2.8 (95% CI 1.6–4.9), indicating that increased body weight is a strong independent predictor of venous disease.

BMI Category	Total (n)	Varicose Veins n (%)
Normal	70	20 (28.6%)
Overweight	84	38 (45.2%)
Obese	46	31 (68.4%)

Table 4. Lifestyle Factors

Lifestyle factors showed moderate association with varicose veins. Sedentary individuals had higher prevalence (54.2%) compared to physically active individuals (38.5%) ($p = 0.03$). Smoking was associated with increased risk (52.8%) compared to non-smokers (42.1%), though the difference was not statistically significant ($p = 0.09$). These findings suggest lifestyle behaviors contribute to venous insufficiency, albeit less strongly than occupational and obesity factors.

Factor	Category	Varicose Veins n (%)	p-value
Physical Activity	Active	38.5%	0.03
	Sedentary	54.2%	
Smoking	Yes	52.8%	0.09
	No	42.1%	

Discussion

The present study highlights a significant association between occupational exposure, obesity, and lifestyle factors with the occurrence of varicose veins. The overall prevalence of varicose veins observed in this study is consistent with previously reported epidemiological data, which indicate that chronic venous disease remains a common condition affecting a substantial proportion of adults worldwide [11]. Occupational factors, particularly prolonged standing, emerged as the most significant determinant in this study. Individuals engaged in occupations requiring prolonged standing demonstrated a markedly higher prevalence of varicose veins compared to those with non-standing occupations. This finding is in agreement with earlier occupational health studies, which demonstrated that prolonged standing leads to sustained venous hypertension, resulting in progressive valvular incompetence and venous dilation [12]. Mekky et al. first reported a higher

prevalence of varicose veins among women engaged in standing occupations, establishing occupational posture as a critical risk factor [13]. Similarly, Tüchsen et al. demonstrated an increased risk of hospitalization due to varicose veins among workers exposed to prolonged standing [7]. Obesity was identified as another major independent risk factor, with obese individuals showing significantly higher prevalence. This observation is consistent with earlier studies that reported a strong association between increased body mass index and chronic venous insufficiency [14]. The pathophysiological mechanism is attributed to increased intra-abdominal pressure, which impairs venous return and promotes venous stasis, thereby contributing to venous hypertension and valve dysfunction [15]. Lifestyle factors also played a contributory role in the development of varicose veins. Sedentary individuals in this study exhibited a higher prevalence compared to physically active individuals. Reduced physical activity leads to diminished calf muscle pump function, which is essential for effective venous return, thereby promoting venous stasis [16]. Although smoking showed a moderate association, it did not reach statistical significance, which is consistent with previous studies suggesting that smoking may play a secondary role compared to primary factors such as occupation and obesity [17].

Age-related increase in prevalence observed in this study is in line with established literature, which attributes this trend to degenerative changes in venous walls and progressive valve failure over time [18]. Gender differences were not statistically significant in the present study, which contrasts with earlier reports showing female predominance but may reflect changing occupational roles and lifestyle patterns in recent decades [19].

The findings of this study reinforce the multifactorial nature of varicose veins, where both occupational and lifestyle factors interact to influence disease development. Preventive strategies should focus on modifiable risk factors, including weight reduction, increased physical activity, and ergonomic workplace modifications. The use of compression stockings has also been shown to reduce occupational leg swelling and may play a preventive role in high-risk individuals [20].

The strengths of this study include its prospective design and objective diagnosis using duplex ultrasonography. However, limitations include the single-center setting and reliance on self-reported lifestyle data, which may introduce bias. Future multicentric studies with larger sample sizes are recommended to validate these findings and develop targeted preventive strategies.

Conclusion

This study demonstrates that obesity and occupations involving prolonged standing are significant risk factors for the development of varicose veins. Individuals engaged in standing occupations exhibited markedly higher prevalence, emphasizing the role of occupational posture in venous disease pathogenesis. Obesity further amplifies this risk through increased venous pressure and mechanical strain on the venous system. Lifestyle factors such as physical inactivity also contribute to disease progression, although to a lesser extent.

These findings underscore the need for preventive strategies focusing on workplace ergonomics, weight management, and promotion of physical activity. Early identification and intervention in high-risk individuals can reduce complications and improve quality of life. Future multicentric studies with larger sample sizes and longitudinal follow-up are recommended to further validate these associations and guide public health policies.

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