E-ISSN: 2616-3470
P-ISSN: 2616-3462

www.surgeryscience.com
2019; 3(4): 06-10
Received: 13-08-2019
Accepted: 17-09-2019

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A prospective study on etiology and clinical features of varicose veins: A hospital based study

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DOI: https://doi.org/10.33545/surgery.2019.v3.i4a.209

Abstract
Background: Varicose vein are abnormally dilated, tortuous, elongated veins of lower limbs which have permanently lost their valvular efficiency. The main objectives of our study was to study etiological profile (Age, sex, occupation and site pathology) and different modalities utilized in our institute and to assess and study final outcome in patients included in our study.
Methodology: It was a prospective study; fifty cases of varicose veins were attending outpatient Department and admitted in the Surgical Department of Deccan Medical College & Hospital from October 2018 to September 2019.
Results: In the present study, fifty cases of varicose veins treated in our institute form the basis of this study. The average age of the patients was 41.86 years. The youngest patient was of 19 years and the oldest was 65 years of age. Varicose veins were common in males; the male to female ratio was 3.1:1. The number of patients who were involved in occupations requiring prolonged hours of standing was 35 (70%). A positive family history of varicose veins was present in only 4 cases (8%). Deep vein thrombosis was present in 7 patients (12.72%). The commonest presentation was dilated veins. The common associated symptoms were itching and pigmentation in 27 patients (54%) and ulceration in 13 patients (26%). 5 patients had bilateral varicose veins and the remaining 45 had only one limb affected. The limb commonly affected was right lower extremity in 29 cases (52.7%). Long saphenous vein was involved in 42 limbs (76.36%) and both long and short saphenous vein were affected only in 3 limbs (5.4%).
Conclusion: The database of our retrospective study regarding age & sex incidence, clinicopathological features and therapeutic outcome was comparable to other studies in various literatures.

Keywords: Varicose veins, ulceration, deep vein thrombosis, long saphenous vein

Introduction
Varicose veins are a major health problem in the western countries affecting probably one in five women and one in fifteen men [1]. Because of the symptoms caused by them, varicose veins significantly reduce the person's working capacity. Whereas in India the men are affected more than women along with its complications as compared to Western world [2]. Of the all earth's mobile animals only man with his penchant for standing is afflicted by this abnormal condition [3]. The primary cause is the familial tendency of structural dysfunction of the vein wall and their valves. Secondarily varicosities develop after damage to valves or obstruction to venous flow. Occupational predisposition, pregnancy, hormonal changes, pelvic tumors, deep vein thrombosis, thrombophlebitis, bony displacements and tricuspid incompetence [4] Castleman's disease [5] can lead to secondary varicose veins.
Postural discomfort like heaviness, dull aching pain, swelling, dilated veins are the usual presentations [6]. Varicose veins can complicate in form of bleeding, eczema, thrombophlebitis, ulceration, ankle deformity in form of equinus varus and deep vein-thrombosis [1].
Ever since it has been contemplated upon the management of varicose veins has been both intriguing and alluding. A perfect solution to this has still not been reached and hence the quest for the newer techniques. With the development of radiological techniques the location of the pathological veins has become quiet perfect which was solely dependent on the clinical examination. With the advent of non-invasive techniques which are easily reproducible and less expensive ones like duplex Doppler and various types of plethysmographies have replaced venography [7, 8].

Over centuries numerous modalities like puncture, avulsion, excision, cautery, ligation, injection sclerotherapy and stripping have been used with various degree of success. With the realization of importance of the vein in vascular reconstruction more vein saving procedures are coming up in recent days [6].
The aim of our present study on varicose veins is to throw light on clinical presentation in relation to age, sex, predisposing conditions with special significance to complications.

Methodology

Study design

Fifty cases of varicose veins were attending outpatient department and admitted in the surgical department of our institute from October 2018 to September 2019. The cases were studied purely on prospective basis. No retrospective cases were added in the study.

Inclusion criteria

Patients presenting with signs and symptoms of primary varicose veins that get investigated with Doppler and undergoing any appropriate definitive surgical procedure.

Exclusion criteria

1. Secondary varicose veins
2. Recurrent varicose veins
3. Deep venous incompetence
4. Varicose veins other than lower limbs

Study design

All patients who presented to our outpatient Department with symptoms of primary varicose veins were meticulously by examined and later subjected to Colour Doppler studies before they underwent surgery for the same.

Clinical examination

After obtaining an adequate history, the patient was examined in standing position with good Illumination, exposing both the lower limbs completely. The following tests were performed: Brodie trendelenburg I and II, Modified Parthe's test, multiple tourniquet tests, Schwartz test, Morrissey's cough impulse test, Fegan's test.

Management

After clinical examination and investigation the patients were classified into two categories.

Category I

This included patients who are having symptoms without any complication. These patients were initially treated conservatively and if not relieved of the symptoms in 6 weeks then only subjected for surgical management. Most of these patients were treated on the outpatient basis.

Category II

This included those presenting with long term symptoms with associated complications like oedema or ulceration. They were first subjected to conservative line of management with an objective to control the associated complications. Later, they underwent definitive operative treatment. The conservative treatment included.

Results

This study includes 50 cases of varicose veins that attended out patients department or were admitted for the same, from October 2018 to September 2019 at our institute. All cases were prospectively studied, no retrospective data was considered. In this study the following were the observations noted with respect to the clinical data and results.

Age incidence

The youngest patient in the present study was a 19 yr. old while the oldest patient was a 65 years old. The maximum incidence of varicose veins was seen in the age group between 31 to 40 yrs. The average age of the patients in this study was 41.86 years.

Table 1: Showing age incidence in varicose veins cases

Age in years	No. of pts	Percentage
11-20	2	4%
21-30	12	24%
31-40	13	26%
41-50	10	20%
51-60	10	20%
61 & Above	3	6%
Total	50	100%

Sex distribution

Out of the 50 patients treated, thirty eight were males and only 12 patients were females. The male to female ratio was found to be 3.1: 1. (38: 12).

Table 2: Sex distribution of the cases

Sex	No. of patients	Percentage
Males	38	76%
Females	12	24%
Total	50	100%

Occupation

In the 50 patients who were evaluated, 35 patients were engaged in occupations involving prolonged hours of standing. The maximum number of patients were found to be farmer.

Table 3: Shows the occupation of the cases

Occupation	No. of patients	Percentage
Occupation involving prolonged standing	35	70%
Occupation not involving prolonged standing	15	30%
Total	50	100%

Family history

Out of 50 patients, 4 of them gave a positive history of varicose veins in the family. Two had on maternal side and two on paternal side.

Table 4: Shows the occupation of the cases

Family history	No. of patients	percentage
Present	4	8%
Absent	46	92%
Total	50	100%

History of pregnancy associated varicosity

Out of 50 patients, 12 were females. 3 females of these were having presentation of varicosities during pregnancy.

Table 5: Showing Frequency of history of pregnancy associated varicosity cases

	No. of patients	Percentage
Female having h/o pregnancy	3	25%
Female not having h/o pregnancy	9	75%
Total	12	100%

Clinical presentation

All the fifty cases studied presented with the complaint of dilated veins over the lower limbs. Out of these, 10 (20%) patients had no other associated complaints. While the other 40 patients (80%) had in addition, other complaints, of which pain, itching, pigmentation and ulceration varying from 20 to 60%**.** No patient presented with history of bleeding.

Table 6: Clinical presentation of varicose vein patients

	Clinical presentation	No. of pts	Percentage
1.	Dilated veins only	10	20%
2.	Dil. veins + Pain	27	54%
3.	Dii veins + Cedema	15	30%
4.	Dii. veins + Itching & Pigmentation	30	60%
5.	Dil. veins + Ulceration	13	26%
6.	Dil. veins + Bleeding	0	0%

Side of lower extremity involved

Of the 50 patients, both the lower extremities were involved in 5 patients and remaining 45 patients had only one of them affected. Out of the 45 lower limbs affected, the side more commonly involved was the right side in 29 (55%).

Table 7: Side of lower extremity affected

	Rt. leg	Lt. leg	Total
Only one leg affected	24	21	45
Both legs affected	5	5	10
	29 (52.7%)	26 (47.3%)	55 (100%)

Superficial venous system involved

Out of the 55 affected limbs of 50 patients examined, the system more commonly affected was the long saphenous vein in 42 limbs (76.36%). Both the long and short saphenous veins were affected in 3 limbs.

Table 8: Showing superficial venous system involved

Venous system involved	No. of limbs	Percentage
Long Saph. Vein	42	76.36%
Short Saph. Vein	10	18.18%
Both venous system	3	5.4%
Total	55	100%

Skin changes observed

Out of the 55 limbs affected by varicose veins, 22 limbs did not show any obvious skin changes. The remaining 33 limbs had skin changes like pigmentation, lipodermatosclerosis, eczema, and ulceration. The commonest skin change observed was pigmentation in 32 (58.18%).

Table 9: Showing superficial venous system involved

Skin changes	No. of limbs	Percentage
No skin changes	22	40%
Pigmentation	32	58.18%
Eczema	19	34.54%
	9	16.36%

Site of pathology in the venous system

After examining the 55 limbs and the superficial venous system involved in them, the exact site of pathology after clinical examination were determined. They were found to be involving either the sapheno-femoral valve, the sapheno-popliteal valve or the valves of the perlorators, further classified as above knee, below knee, and above ankle, mid-calf perforator.

Commonest sites of defect were the perforator valves in limbs while sapheno-femoral valve was the next common site.

Table 10: Showing site of valvular defect

Valvular defect	No. of limbs	Percentage
Sapheno-femoral valve	20	36%
Sapheno-popliteal valve	7	12.72%
Above knee Perforator	17	30.90%
Below Perforator	33	60%
Above ankle Perforator Valve	18	32.72%
Mid-calf Perforator Valve	10	18.18%

Discussion

Man has to pay some penalty for the pleasures and benefits derived from having himself elevated to the upright position. Thus, he placed added burden on certain structures and brought pathological states seldom seen in the quadrupeds. One such pathological state is the entity of 'Varicose veins of the low limbs' [3]. The management of varicose veins has always been a challenge. This disease is very wide spread among the western population, affecting about 20% of the adult population [3]. In India, though it is not a major health problem, varicose vein because of their discomforting symptoms lead to significant morbidity and loss of working hours [2].

Various techniques of treatment have been carried out with an aim to completely cure this condition. Unfortunately, there has not been a single regimen that has stood the test of time. Hence, even now newer methods in the evaluation of varicose veins and newer techniques in the surgery for varicose veins are being invented [9].

No wonder, the newer diagnostic tools like phlebography, plethysmography, continuous colour doppler have made the diagnosis more specific and the newer technique of treatment like valvuloplasty [10] cryovaricectomy [8, 11] have kindled a hope in a more promising management of this entity. A total control over this is still a dream. In this study an attempt has been made to make a detailed observation of this condition in relation to its age, sex, incidence, presentation, complications and effectiveness of the commonly followed treatment modalities. Fifty cases have been evaluated and logical conclusions have been sought in this venture.

Etiological aspects

Age

Age is one of the factor blamed for development of varicose veins. 20 Various western clinical and epidemiological studies show that varicose veins is a disease of middle age group [12]. A similar Indian study, also confirms that this is a disease of middle age, the average being 41.86 years [2].

Table 11: Comparison of age incidence

	Study	Youngest	Oldest	Average age
1.	Burnand KG *et al*. [8]	30	70	50
2.	Hoare MC *et al*. [13]	45	77	58
3.	Vaidyanathan S *et al*. [2]	22	56	39
4.	Redwood NFW [14]	24	82	50.6
5.	Present Study	19	65	41.86

In the present study, the average age of 41.86 years is comparable with other Indian study. It is comparatively low as compared to the western studies. The youngest patient in this study being 19 yrs. and oldest being 65 are comparable to others studies.

Sex

It is well documented in the literature & various clinical studies done in the west that varicose vein is a disorder affecting females, as much as three times more commonly than the males.

The hormonal & mechanical factors are believed to be the cause of increased incidence in the females. These include hormonal changes brought about during menarche, menstruation, pregnancy, lactation & menopause. The hormonal effect, particularly of progesterone on the veins [15] causes the laxity of the venous walls & also increases the susceptibility to deep vein thrombosis [16]. The mechanical effect of the gravid uterus on venous blood flow is also blamed.

Table 12: Comparison of sex ratio

Study	Male: Female ratio
Redwood NFW (1994) [14]	1:3
Sethia & Darke (1986) [17]	1:1
Vaidyanathan S (1985) [2]	2:1
Present study	3.3:1

It is seen in a study conducted in Indian scenario, shows reversal of male to female ratio as compared to western studies [2]. In the present study also, we have marked male dominance in the incidence. This could be attributed to the male being the sole bread-winner of the family is subjected to prolonged hours of standing.

Secondly, in rural & semirural area, from where most of our patients come, females being shy, do not present for receiving treatment. Moreover, the female, in Indian culture, attire completely covering the legs, may be the cause of negligence of this entity. In western world, cosmetic disfigurement is one of major cause for presentation. Further the poor health knowledge & poor socio-economic status also contributed to the same.

Occupation

It is a well-documented fact that the occupation of an individual plays a vital role in the development of varicose veins. Occupations involving prolonged hours of standing predisposes to the development of varicose veins due to venous stasis [1].

The following table shows the association of varicose veins with occupations involving prolonged hours of standing.

Table 13: Study of patients

Study	% of patients
Jakobson BN (1979) [19]	63.8%
Present study	70%

The above table shows the association of occupation involving prolonged hours of standing substantially correlates with the figures found in the other studies. So it can be said that prolonged standing may be an accentuating factor, rather than an etiological factor.

Family history

There is a familial tendency of weakness of vein wall & valves. In these families veins dilate under normal venous pressure & thus lead to this leads to valvular incompetency.

Table 14: Comparison of association with positive family history

Source	% With positive family history
T.B The pathology & surgery of varicose veins by Dodd & Cockect (1976) [1]	70%
Study by Keith LM *et al*. (1983) [20]	80%
Present study	8%

Considering the low incidence of this in India as compared to western world, this association is on lower side in our study. In Indian population significance of family history cannot be stressed much [1].

Side of the lower extremity involved

various western studies [13] conducted show a marginally increased frequency of varicose veins in left extremity.

Table 15: Comparison of predisposition for the side of extremity involved.

Study	Rt. leg	Lt. leg
Hoare MC *et al*. [13]	11 (47.8%)	12 (52.2%)
Present study	29 (52.7%)	26 (47.3%)

The findings in present study show the more incidence on right side. This may be due to that constipation is not as common in Indians as in Western people and other etiological factors may be playing more roles in development of varicose veins. The relative predominance in either side of leg appears statically insignificant.

Constipation has been documented as a precipitating factor in the development of varicose veins in various medical literatures. The pressure of the loaded sigmoid on the proximal veins of the left side in the pelvis perhaps can explain the increased incidence of the left [18].

Mode of presentation

Obviously all the patients with varicose veins have the complaint of dilated tortuous veins of the lower extremities. The other complaints those may be present include pain, swelling, itching and ulceration.

Pain is usually dull aching after prolonged standing. This can occur due to venous stasis and increased intra-venous pressure or due to associated deep vein thrombosis. Swelling may be complained due to the oedema occurring once again as result of increased venous hypertension.

Itching occurs due to the release of various vaso-active peptides from the trapped leucocytes, and the deposition of hemosiderin from the lysed RBCs. Ulceration is due to the ischemic necrosis of the epidermal and dermal elements due to disturbance in microcirculation of skin.

Table 16: Comparison on mode of presentation

Study	Pain	Swelling	Itching Pigmentation	Ulceration	Bleeding
Seshadri Rajut [21]	10%	21%	-	2.5%	-
Fegan WG [22]	34%	6.6%	-	12%	-
Verma BK *et al*. [23]	85%	95%	-	30%	-
Vaidyanathan [2]	-	-	-	46.6%	
Present study	60%	30%	60%	26%	0%

The table shows less incidence of complications in western world, while the late complications like itching, ulceration, bleeding are present at the time of seeking medical help, are more common in the Indian studies. The findings of the present study also co-relate the same. This could be due to the decreased awareness in the Indian population and hence the initial negligence of this disease.

Conclusion

Varicose veins is a common disease affecting the middle aged group males rather than females and people engaged in occupations involving prolonged hours of standing. Commonest presentation is dilated veins affecting unilateral limbs, with associated symptoms of itching, pigmentation and ulceration. Common factors responsible are occupations involving prolonged hours of standing, familial predisposition and post deep vein thrombosis though its incidence is low as compared to western countries.

Acknowledgement

The author is thankful to Department of General Surgery, Deccan Institute of medical Sciences & Hospital for providing all the facilities to carry out this research work.

Conflict of Interest

The author declares that, they have no conflict of interest.

Ethical approval

Ethical approval was taken from Institutional Ethics committee.

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