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Original Research Article

Clinical study of asymptomatic deep vein thrombosis in patients with varicose veins of lower extremities

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ABSTRACT

Background: The main aim is to study the association between asymptomatic deep vein thrombosis (DVT) in patients with varicose veins in different gender and age groups. Secondly, to study the risk of developing DVT in patients having superficial venous thrombophlebitis (SVT) with varicose veins and finally to study the clinical correlation of clinical, etiological, anatomical and pathological (CEAP) classification with DVT in patients with varicose veins.
Methods: Patients presenting to department of General surgery at SS Institute of Medical Science and Research Centre during the period from June 2017 to June 2019 with varicose veins of lower limbs and without clinical signs of DVT were included in this study. Patients were categorised according to CEAP classification. All patients were subjected to duplex scanning of lower limbs to look for presence of SVT and DVT.
Results: In our study, 73% patients were males and 27% patients were females. Maximum patients were in age group of 40-60 years.16 patients had DVT, 38 patients had SVT, 166 patients belonged to C2 and 56 patients belonged to CEAP class C3 and beyond.
Conclusions: There is a strong association between varicose veins and asymptomatic DVT .The presence of SVT is not a risk factor for concomitant DVT in varicose vein patients. Clinical presentation with C3 or more CEAP grade is one of the potential risk factors for concomitant DVT in varicose vein patients.

Keywords: Varicose veins, Deep vein thrombosis, CEAP classification

INTRODUCTION

Chronic venous disorder (CVD) is an important clinical condition with substantial epidemiological implications and socioeconomic repercussions. Its consequences of high prevalence, cost of diagnosis and therapy, the significant loss of working hours and the effect on patients quality of life are well known.[1,2]

CVD, whether caused by superficial or deep venous insufficiency, is a highly prevalent condition, with serious clinical sequela if allowed to progress. From a quality of life (QoL) perspective, CVD is a chronic condition with clear negative effects on mood and well-being.[3]

The risk factors for CVD such as smoking, family history of CVD are becoming an important socio-economic and public health burden. The increasing prevalence of obesity, in addition to the progressive ageing of our population, will result in an increasing prevalence of CVD over the next decade, putting significant strain on available resources for its management.

CVD is a progressive disease. The Bonn Vein study found that over six years, the progression of C2 disease to

higher clinical, etiological, anatomical and pathological (CEAP) classes was 32% in patients with saphenous reflux and 19.8% for those with non-saphenous reflux.[5] This suggests that, if left untreated a significant proportion of patients will move along the spectrum of venous disease from varicose veins, to oedema, progressing to skin changes and ultimately, ulceration.

Varicose vein prevalence is estimated at approximately 30% of the population. However, epidemiological studies report variable figures, from 2 to 56% in men and <1 to 60% in women.[4] Varicose veins are rarely associated with serious health risks. In contrast, deep venous thrombosis (DVT), pulmonary embolism (PE) and peripheral artery disease (PAD) are vascular diseases that are associated with serious systemic effects. Patients with varicose veins have increased levels of inflammatory and prothrombotic markers.[6,7] Inflammation is thought to be associated with the pathophysiology of DVT, PE, and PAD.[8,9]

The annual incidence of DVT is 80 cases per 100,000 with a prevalence of lower limb DVT of 1 case per 1000 population. Annually in the United States, more than 200,000 people develop venous thrombosis; of those, 50,000 cases are complicated by pulmonary embolism.[10-12]

Pulmonary embolism (PE), a dreaded complication of DVT, occurs in up to one-third of cases and is the primary contributor to mortality.[13] Much of the morbidity of DVT results from the development of post-thrombotic syndrome, which occurs in up to 50% of patients within 2 years of DVT and encompasses a number of symptoms including leg pain, swelling, and in severe cases, venous ulcers.[14,15] Anticoagulation is the mainstay of therapy for DVT, with the goal of preventing progression to PE and recurrence of thrombosis. The 30-day mortality rate exceeds 3% in patients with DVT who are not anticoagulated, and this mortality risk increases 10-fold in patients who develop PE.[16]

Superficial thrombophlebitis (ST) of the lower limbs is common, affecting 3% to 11% of the general population.[17] ST is regarded as a benign disease that usually has a self-limited clinical course.[18] Its complications, however, can be serious or even fatal; an association with DVT has been reported.

Descriptive CEAP classification for chronic venous disorders is widely utilised for clinical classification.[19]

Patients with varicose veins have increased levels of inflammatory and prothrombotic markers. The inflammatory processes may cause the study outcomes (DVT) of which the pathophysiology may be due to the inflammatory process.

Objectives

The objectives of the present study are to study the association between asymptomatic DVT in patients with varicose veins in different gender and age groups, to study the risk of developing DVT in patients having superficial venous thrombophlebitis with varicose veins and to study the clinical correlation of CEAP classification with DVT in patients with varicose veins.

METHODS

This is a tertiary care hospital based prospective clinical study conducted in the department of General surgery at SS Institute of Medical Sciences and Research Centre, Davangere from June 2017-June 2019.

Inclusion criteria

Patients with age group of 20 years up to 85 years were presented to department of General surgery at SS Institute of Medical Sciences and Research Centre with features of varicose veins which were included in the study.

Exclusion criteria

Patients with signs and symptoms of DVT, patients with history of DVT, thromboembolic events, recent immobilization active malignant disease, smoking, oral contraceptives, malignancy, sepsis, recent surgery or trauma, autoimmune disorders, pregnancy, hormone therapy, hepatic or renal insufficiency.

Assessment of the site and severity of venous disease was made according to the International Consensus Committee protocol based on CEAP data.[19] Subjects stood on a raised platform with their feet in two standard positions and were asked to remain standing for a minimum of 2 minutes to allow blood to pool in their legs, prior to classification of their veins. Limbs were classified as C0: no visible or palpable signs of venous disease, C1: telangiectases or reticular veins, C2: varicose veins, C3: edema and corona phlebectatica, C4: skin changes ascribed to venous disease (pigmentation, venous dermatitis, and lipodermatosclerosis), C5: skin changes ascribed to venous disease as above with healed ulceration and C6: skin changes ascribed to venous disease as above with active ulceration.

Duplex scanning of the superficial, deep and perforator systems of the index leg was carried out using an ultrasound scanner with a 5 MHz probe.

Statistical analysis

Categorical variables were presented as frequency and percentages. To study the association between categorical variables Chi-square test was used. P value of <0.05 is considered as significant. Statistical analyses were performed with IBM SPSS program for Windows Version 22.

RESULTS

A total of 240 patients were included, of which later 18 patients were excluded as 8 patients were found to have malignancy, 4 patients were pregnant and 6 patients underwent surgery in the recent past. The final study group consisted of 222 cases primary varicose veins with no clinical signs of DVT. Analyses of the results obtained after the completion of study under various parameters are done.

Among all the 222 cases, the gender distributions were analysed. Out of 222 patients, 162 were male patients and 60 patients were females with male to female ratio of around 3:1 (Figure 1).

In our study among 162 male patients with primary varicose veins, around 12 (7.4%) had evidence of DVT on duplex ultrasonography, and 150 (92.6%) patients had no evidence of DVT. In 60 female patients, 4 (6.7%) had evidence of DVT on duplex ultrasonography, and 56 (93.3%) patients had no evidence of DVT (Figure 2).

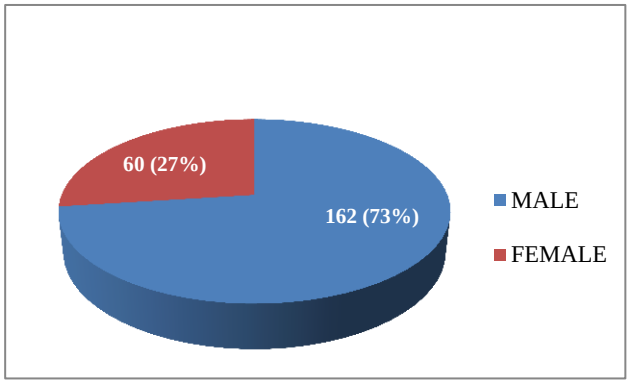

Figure 1: Gender distribution with varicose veins.

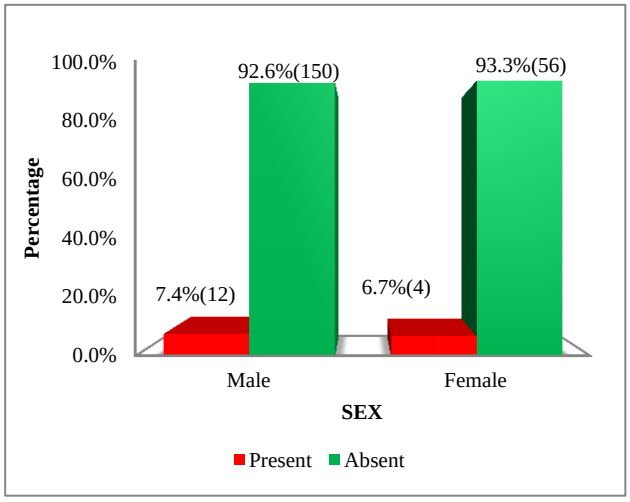

Figure 2: Gender distribution of patients with DVT.

Our study shows 71 patients with varicose veins were in the age group of 20-40 years, out of which 2 (2.8%) patients had DVT. Total of 99 patients with varicose veins belonged to 40-60 year age group, of which 10 (10.1%) patients had DVT. In 60-80 year age group among 49 patients 3 (6.1%) patients had DVT. Among 3 patients with age >80 years 1 had DVT.

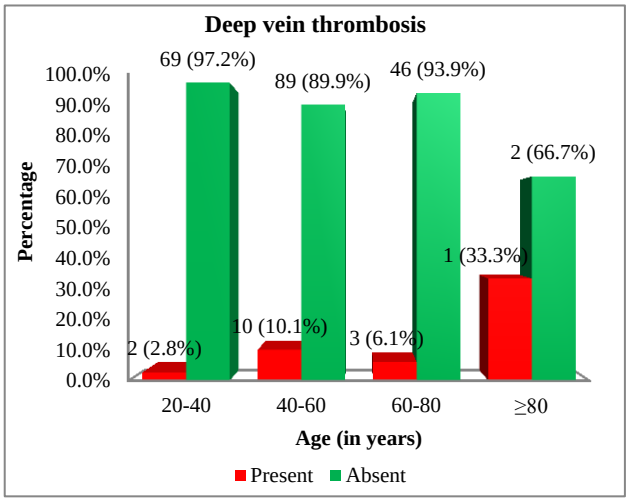

Figure 3: Age wise distribution of patients with DVT.

In this study 38 patients had evidence of superficial vein thrombosis on evaluation, among which only 4 patients had DVT on duplex ultrasonography. Among 184 patients without evidence of superficial vein thrombosis, 12 had DVT on duplex ultrasonography (Figure 4).

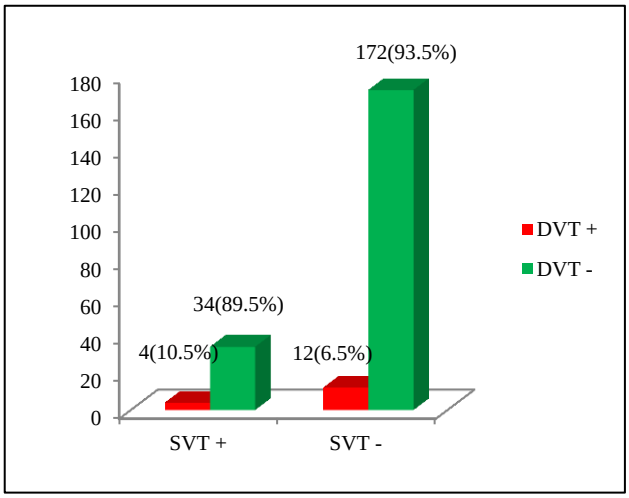

Figure 4: Association between SVT and DVT.

The majority of patients (n=166) had C2 varicose veins, of which only 2 (1.2%) patients had DVT. C3 venous disease was seen in 15 patients, among which 5 (33.3%) had DVT. C4A venous disease was seen in 13 patients and C4B in 9 patients, among which 1 (7.7%) and 4 (44.4%) had DVT respectively. Among 3 patients with C5 venous disease only 1 (33.3%) patient had DVT. Among 16 patients with C6 venous disease 3 (18.8%) patients had DVT.

Table 1: Categorisation of patients according to CEAP classification.

CEAP	Total	DVT		P value
		Present	Absent	
C2	166	2	164	>0.05
	100.0%	1.2	98.8	
C3	15	5	10	<0.05
	100.0%	33.3	66.7	
C4A	13	1	12	
	100.0%	7.7	92.3	
C4B	9	4	5	
	100.0%	44.4	55.6	
C5	3	1	2	
	100.0%	33.3	66.7	
C6	16	3	13	
	100.0%	18.8	81.3	
Total	222	16	206	
	100.0%	7.2	92.8	

DISCUSSION

Till date, not many studies have been done to determine the association between primary varicose veins and deep vein thrombosis.

In our study of 222 patients with varicose veins, 73% were males and 27% were females. But according to the literature, women are affected twice more often than men. This predominance of males in our study might be because; most of our patients are farmers with history of standing for prolonged hours, with more males turning up for the treatment.

The study by Lee et al, Edinburgh vein study shown the prevalence of 40% in men and 32% in women.[20] Our findings are in accordance with the study of Vashist et al which showed 64% of males and 36% of females.[21]

In our study, age of the patients with varicose veins ranged from 18 to 85 years. Maximum patients were in age group of 40-60 years (44%). The finding is in accordance with Edinburgh vein study.[20] Majority of the varicose vein patients with DVT (62%) belonged to age group of 40-60 years, which is in accordance with Chang et al.[24]

In our study, 16 (7.2%) patients with varicose veins had DVT. This association is supported by previous studies, Buhl et al a cross-sectional study in Germany reported a 7-fold higher prevalence of DVT in 2357 patients with varicose veins, based solely on ICD codes without additional verification of the diagnosis.[22]

Study by Engbers et al enrolled 401 patients with DVT and 431 control patients aged 70 years or older reported a 1.6 to 10.5-fold increase in the odds of DVT associated with varicose veins, depending on clinical characteristics such as varicose veins, leg ulcers, and leg edema.[23]

Study by Chang et al had 212984 patients in the varicose veins group (mean [SD] age, 54.5 [16.0] years; 69.3% women) and 212 984 in the control group (mean [SD] age, 54.3 [15.6] years; 70.3% women).[24] The median follow-up duration was 7.5 years for DVT patients with varicose veins, and for the control group. The varicose veins group had higher incidence rates than the control group for DVT (6.55 vs. 1.23 per 1000 person-years [10 360 vs 1980 cases]; absolute risk difference, 5.32 [95% CI, 5.18-5.46]).

In our study 38 patients had superficial vein thrombosis among which only 4(10.5%) had DVT, (p=0.487). This finding is in accordance with study by Hafner et al and Skilman et al.[25,26] This association between patients with varicose veins with superficial thrombophlebitis having an increased risk of developing DVT is not statistically significant in our study, this result is in accordance with the study done by Bounameaux, where 551 patients with superficial thrombophlebitis were studied and 31 (5.6%) were found to have DVT which showed that superficial thrombophlebitis is rarely associated with deep vein thrombosis.[27] Many previous studies reported contradictory prevalence's of the association of the two conditions, ranging from 11% to 44% but the conclusions were mostly derived from small numbers of selected patients.[28,29]

In study by Chengelis et al, progression of superficial thrombophlebitis to the deep vein system, mainly from the long saphenous vein in the thigh into the common femoral vein, occurred in 30 (11%) of 263 patients within 2 to 10 days after the initial examination.[28]

Table 2: DVT in a population with SVT.

Author	Number	%
Hafner et al[25]	9/94	10
Skilman et al[26]	5/42	12
Our study	4/38	10.5

In our study 166 patients had C2 venous insufficiency, among which 2 (1.2%) patients had DVT. 56 patients belonged to C3 and beyond on CEAP classification, among them 14 (25%) patients had DVT, with p value <0.05. In a study done by Shirasugi et al, clinical presentation with C3 or a more grade was one of the potential risk factors for concomitant DVT in the varicose vein patients, this finding correlate with our study.[30]

CONCLUSION

There is a strong association between varicose veins and asymptomatic DVT, however, the presence of SVT is not a risk factor for concomitant DVT in varicose vein patients. Further studies with large sample size is required to clear the controversies associated with it. It is

alarming to note that clinical presentation with C3 (CEAP grading) or more grade was one of the potential risk factors for concomitant DVT in varicose vein patients. So we suggest that DUS screening to be done for the patients with varicose vein C3 or more grades to detect occult DVT.

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