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A Clinico Epidemiological Study of Varicose Veins

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Abstract
Background and objectives: *Venous diseases of lower limb remain commonaffecting 20% of adult population. Objective of this study is to identify cases with primary varicose veins, evaluate with appropriate investigations, collect data and establish the clinical spectrum of complications in this population.*
Methods: *Study was conducted on 50 consecutive patients with primary varicoseveins at Govt. thiruvarur medical college, thiruvarur. All cases of varicose veins presenting to the OPD were subjected to duplex scan to rule out secondary causes. Patients admitted with varicose veins who satisfied the inclusion and exclusion criteria were included in the study.. Patients who presented with bilateral disease got their symptomatic limb operated first while the other limb was treated conservatively Patients with saphenofemoral incompetence were treated with saphenofemoral junction ligation and stripping of long saphenous vein. Patients with saphenopopliteal junction incompetence were treated with saphenopopliteal junction ligation with or without stripping of short saphenous vein. Patients with perforator incompetence were treated with subfascial ligation of perforators*
Results: *Out of 50 patients studied, 39 (78%) patients were agriculturists, whoadmitted of having been exposed to prolonged hours of standing .Among the 50 cases studied, 70 limbs showed varicose veins, of which 32 limbs had long saphenous vein and communicating system involvement (45.7%). 20 limbs had long saphenous vein involvement (28.5%) alone. Among 32 limbs with long saphenous and communicating system involvement, 24 had pain (75%), 7 had oedema (21.8%), 18 had disfigurement (56.2%), 8 ulcers (25%). Among 20 limbs with only long saphenous involvement 10 had pain (50%), 3 had oedema (15%), 4 had disfigurement (20%), 2 had ulcer (10%).Of the 48 limbs that underwent surgery 26 (54.1%) underwent saphenofemoral flush ligation with stripping of LSV and subfascial ligation of perforators*
Conclusion*: Definite relationship exists between occupation involving prolongedstanding and primary varicose veins.The involvement of long saphenous and communicating system together is commonest followed by long saphenous involvement alone. Patients with involvement of long saphenous and communicating system or long saphenous and short saphenous system were more symptomatic than others Complications of varicose veins were responded well to operative treatment. Results of surgical treatment are good*
Keywords*: LSV,SSV, Varicose vein,Doppler,Sclerotherapy,Radiofrequencyablation, Trendelenburg operation, Compression bandage, Duplex scan*

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I. Introduction

Venous diseases of lower limb remains common affecting 20% of adult population.In general these cause no major life threatening illness and yet the morbidity of venous ulceration places a substantial burden on the community health care and results in expenditure of large sums on daily management of this problem.[1] Despite the frequency of venous disease, surprisingly little is understood of the circumstances that lead to valvular incompetence, or the mechanisms by which chronic venous insufficiency leads to venous ulceration. Our understanding of the fundamental pathologic processes has advanced considerably in the last decade and a reappraisal of these diseases is now needed. Technological advances in particular colour duplex ultrasonography now offers improved diagnostic accuracy in patients with venous disease.[2] This should be the minimum investigation before undertaking any operation for venous diseases of the lower limb. Venous ulceration may be partially attributable to failure of the microcirculation of the skin to provide nutrition, but inflammatory mediators and toxic products from inflammatory cells probably play a major part in causing the skin damage. Complex venous disease may be comprehensively investigated using duplex ultrasound imaging combined with a plethysmographic method of assessing venous function. Sclerotherapy remains an effective treatment for selected patients presenting with varices in the absence of major truncal incompetence, or in whom long saphenous or short saphenous has been treated surgically. During surgical treatment, stripping of long

saphenous vein is preferable to sapheno-femoral ligation alone. The latter course of action allows venous reflux to persist in the trunk of long saphenous vein in over 50% of cases. A better clinical outcome will be achieved particularly in patients with chronic venous insufficiency, when all sources of venous reflux have been controlled. Combined with surgery through small sized incision more aesthetic results will be achieved in patients with varicose veins.

OBJECTIVES OF THE STUDY

1. To identify all admissions with primary varicose veins.
2. To evaluate patients having primary varicose veins with appropriate investigations and recognize complications.
3. To collect data and establish the clinical spectrum of complications in this population.
4. To suggest measures to improve patients understanding in order to prevent complications.

AIMS OF STUDY

1. Correlation of the anatomical distribution of venous reflux with clinical symptoms in primary Varicose veins.
2. To study in detail various clinical manifestations, complications, investigations and various treatment modalities, which is necessary for early diagnosis and individualization of treatment, plan as well as prevention of complications.

II. Methodology

This clinical study of primary varicose veins and its complications was conducted in department of surgery at Govt. Thiruvarur medical college, Thiruvarur. Clearance was obtained from hospital ethical committee.

During this period 50 patients having primary varicose veins were selected by purposive random sampling. All cases of varicose veins presenting to the OPD were subjected to duplex scan to rule out secondary causes. Patients admitted with varicose vein who satisfied the inclusion and exclusion criteria were included in the study. All the required data was collected from patients during their stay in the hospital, during follow up at regular intervals and from medical records.

Inclusion criteria:

All patients with primary varicose veins were included in the study.

Exclusion criteria:

All patients with secondary varicose veins (secondary to arteriovenous fistula, iliac vein thrombosis DVT, pelvic tumour) were excluded from study

MANAGEMENT:

Patients were first seen in OPD, history was taken, symptoms and signs recorded followed by general and local examination. Secondary causes were ruled out using the duplex scan. Cases with complications were initially treated conservatively in order to improve the associated complications like ulcers, eczema, and dermatitits and later subjected to operative treatment. Patients who presented with bilateral varicose veins got their symptomatic limb operated first, while the other limb was treated conservatively.

Patients with saphenofemoral incompetence were treated with saphenofemoral junction ligation and stripping of long saphenous vein. Patients with saphenopopliteal junction incompetence were treated with saphenopopliteal junction ligation with or without stripping of short saphenous vein. Patients with perforator incompetence were treated with subfascial ligation of perforators. Recurrent varicosities, isolated perforator incompetence, residual varicosities after surgery were treated with sclerotherapy.

FOLLOW UP:

Patients were followed up in the ward for a period of ten days following surgery and after suture removal were discharged with advice to apply compression bandage for two months and to come for follow up in OPD once in 15 days.

III. Results

Statistical methods employed

Following statistical methods were employed in the present study.

1. Contingency coefficient analysis (CC)
2. Chi-square test

3. One-way ANOVA

1. Contingency coefficient analysis (Cross tabs Procedure)

The Cross tabs procedure forms two-way and multiway tables and provides a variety of tests and measures of association for two-way tables. The structure of the table and whether categories are ordered determine what test or measure to use. Crosstabs' statistics and measures of association are computed for two-way tables only. If one specifies a row, a column, and a layer factor (control variable), the Cross tabs procedure forms one panel of associated statistics and measures for each value of the layer factor (or a combination of values for two or more control variables). For example, if GENDER is a layer factor for a table of MARRIED (yes, no) against LIFE (is life exciting, routine, or dull), the results for a two-way table for the females are computed separately from those for the males and printed as panels following one another.

Chi-square test

The Chi-Square Test procedure tabulates a variable into categories and computes a chi-square statistic. This goodness-of-fit test compares the observed and expected frequencies in each category to test either that all categories contain the same proportion of values or that each category contains a user-specified proportion of values.

One-way ANOVA

The One-Way ANOVA procedure produces a one-way analysis of variance for a quantitative dependent variable by a single factor (independent) variable. Analysis of variance is used to test the hypothesis that several means are equal. This technique is an extension of the two-sample t test. In addition to determining that differences exist among the means, one may want to know which means differ. There are two types of tests for comparing means: a priori contrasts and post hoc tests. Contrasts are tests set up before running the experiment and post hoc tests are run after the experiment has been conducted.

All the statistical operations were done through SPSS for Windows, Version 10.0 (SPSS Inc, 1999, New York) (Statistical Presentation System Software).

The following observations were made from the data collected during the clinical study of primary varicose veins and its complications.

Age distribution:

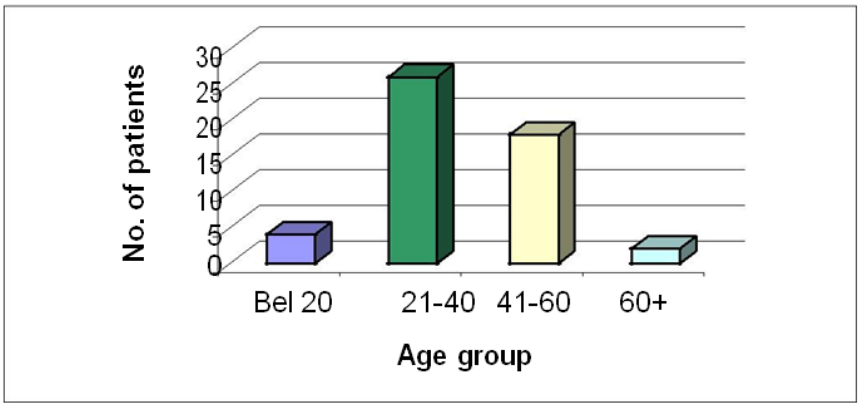
In this series, age varies from 18 to 62 years,.4 patients(8%) were less than 20 years of age, 26(52%)were in the age group 21-40, 18 patients(36%)were in the 41-60 age group, 2(4%) were more than 60yrs of age.

Table -1: Age distribution

Age group	Frequency	Percent
<20	4	8
21-40	26	52
41-60	18	36
Above 60	2	4
Total	50	100

Chi square-31.6: P<. 000(S)

Graph-1: Age distribution



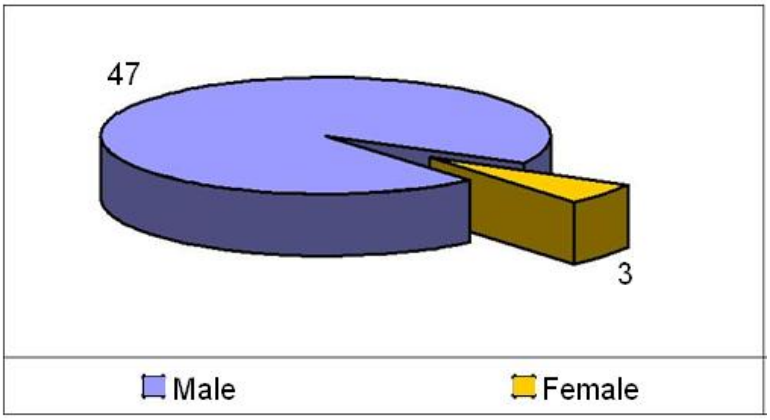
Sex distribution:
In the present series of 50 cases, 47 (94%) were males and 3 (6%) were females.

Table 2-: Sex distribution

Sex	Frequency	Percent
Male	47	94
Female	3	6
Total	50	100

Chi square-38.72: P<. 000(S)

Graph-2: Sex distribution



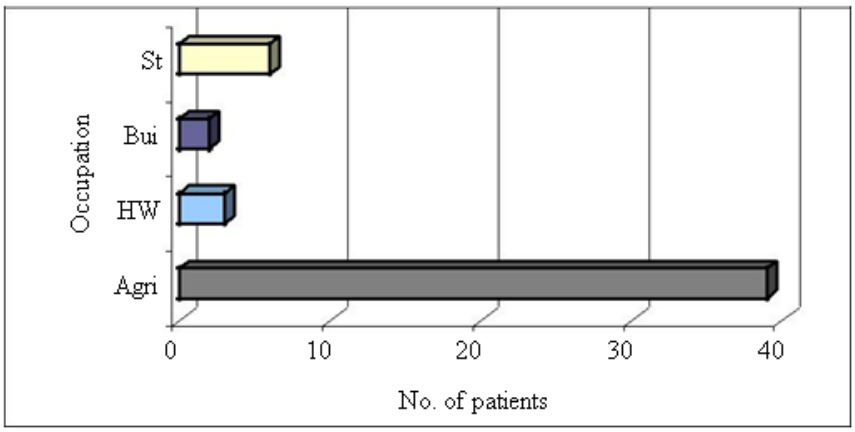
Occupation:
Out of 50 patients studied, 39 (78%) patients were agriculturists, who admitted of having been exposed to prolonged hours of standing. 6 (12%) were students, 3 (6%) housewives, 2 (4%) businessmen.

Table-3: Occupation distribution

Occupation	Frequency	Percent
Agri	39	78
HW	3	6
Bui	2	4
St	6	12
Total	50	100

Chi square-75.6: P<. 000(S)

Graph-3: Occupation distribution



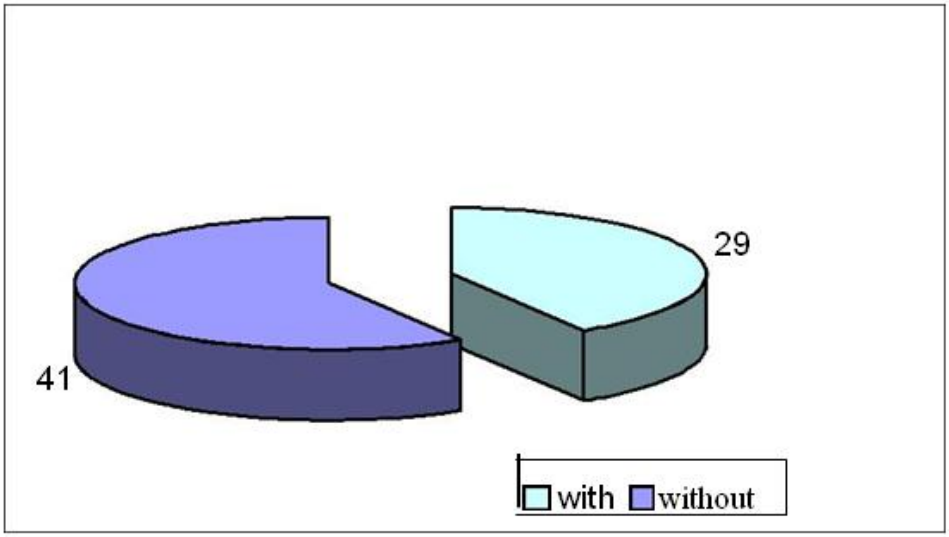
Distribution of limbs based on their association with complications
Out of 50 cases studied, 70 limbs had varicose veins, of which 29 limbs were associated with complications and 41 had no .complications .

Table 4 Distribution of limbs based on their association with complications

Complications	No of limbs	Percent
With	29	41.43
Without	41	58.57
Total	70	100

Chi square-2.037: P<. 151(NS)

Graph-4 Distribution of limbs based on their association with complications



Systems involved:

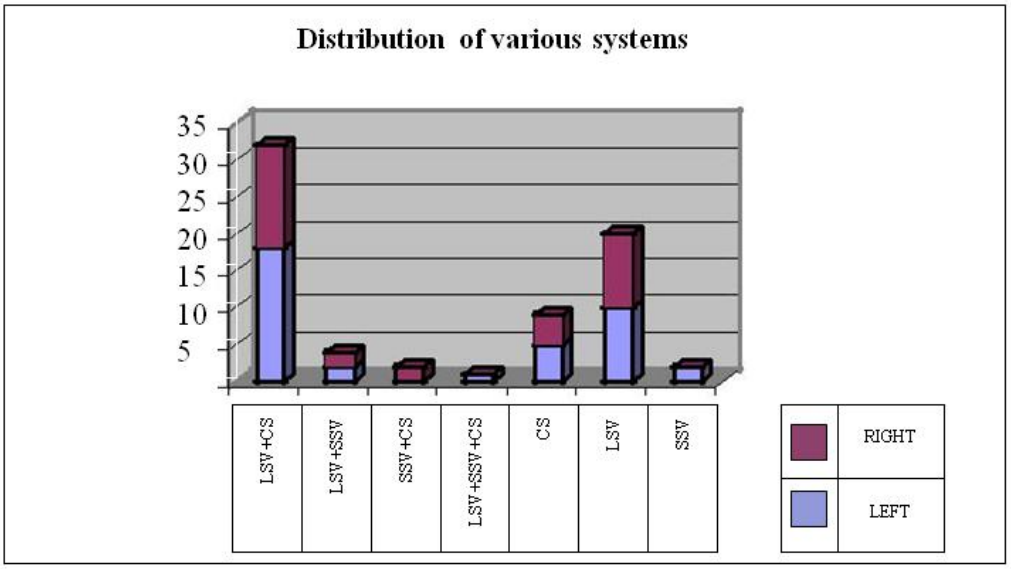
Among the 50 cases studied, 70 limbs showed varicose veins, of which 32 limbs had long saphenous vein and communicating system involvement (45.7%).

20 limbs had only long saphenous vein involvement (28.5%)., 9 limbs had communicating system involvement (12.8%), 4 limbs had long saphenous and short saphenous involvement (5.7%). 2 limbs had short saphenous and communicating system involvement (2.8%). 2 limbs had short saphenous involvement only (2.8%). One limb had short saphenous, long saphenous and communicating system involvement (1.4%)

Table 5. Distribution of various systems

Systems	left	right	total	percent
LSV+CS	18	14	32	45.71
LSV+SSV	2	2	4	5.71
SSV+CS	0	2	2	2.86
LSV+SSV+CS	1	0	1	1.43
CS	5	4	9	12.86
LSV	10	10	20	28.57
SSV	2	0	2	2.86
total	38	32	70	100
Chi square	**34.316**	**18.0**	**61.486**	
P	**P<.000(S)**	**P<.000(S)**	**P<.000(S)**	

Graph-5: Distribution of various systems



Symptoms:

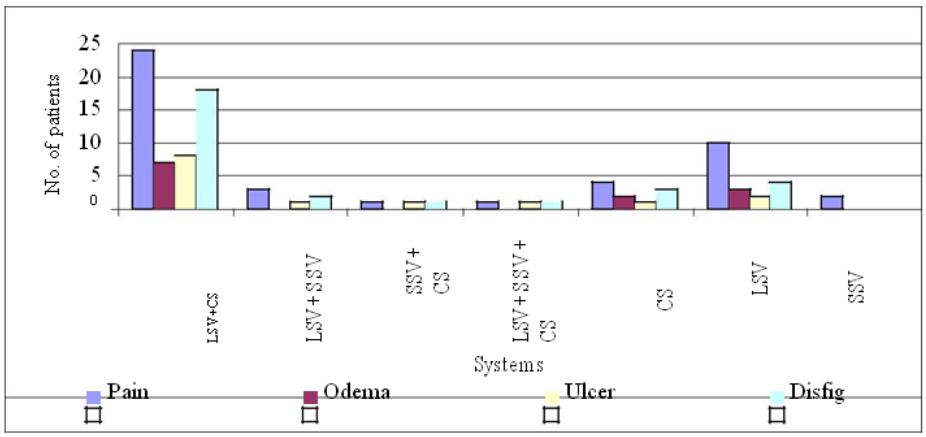
All patients with bilateral disease had symptoms only in one limb. The limb, which was symptomatic, was subjected to surgery and other was conserved. Among 32 limbs with long saphenous and communicating system involvement 24 had pain (75%), 7 had oedema (21.8%), 18 had disfigurement (56.2%), 8 ulcers (25%). Among 20 limbs with only long saphenous involvement, 10 had pain (50%), 3 had oedema (15%), 4 had disfigurement (20%), 2 had ulcer (10%). Among the 9 limbs with communicating system involvement ,4 had pain (44.4%), 3 disfigurement (33.3%), 2 oedema (22.2%), 1 ulcer (11.1%). Of the 4 limbs with long and short saphenous involvement 3 had pain (75%), 2 had disfigurement (50%), 1 had ulcer (25%). Of the 2 limbs with short saphenous and communicating system involvement 1 had pain (50%), disfigurement (50%) and ulcer. Only one limb with involvement of short, long saphenous and communicating system had pain, ulcer and disfigurement.

Table 6. Distribution of symptoms in various systems

Systems	Pain	Edema	Ulcer	Disfigurement	Cramps
LSV+CS	24	7	8	18	0
LSV+SSV	3	0	1	2	0
SSV+CS	1	0	1	1	0
LSV+SSV+CS	1	0	1	1	0
CS	4	2	1	3	0
LSV	10	3	2	4	0
SSV	2	0	0	0	0
total	45	12	14	29	0

CC=. 269:P<. 981(NS)

Graph-6: Distribution of symptoms in various systems

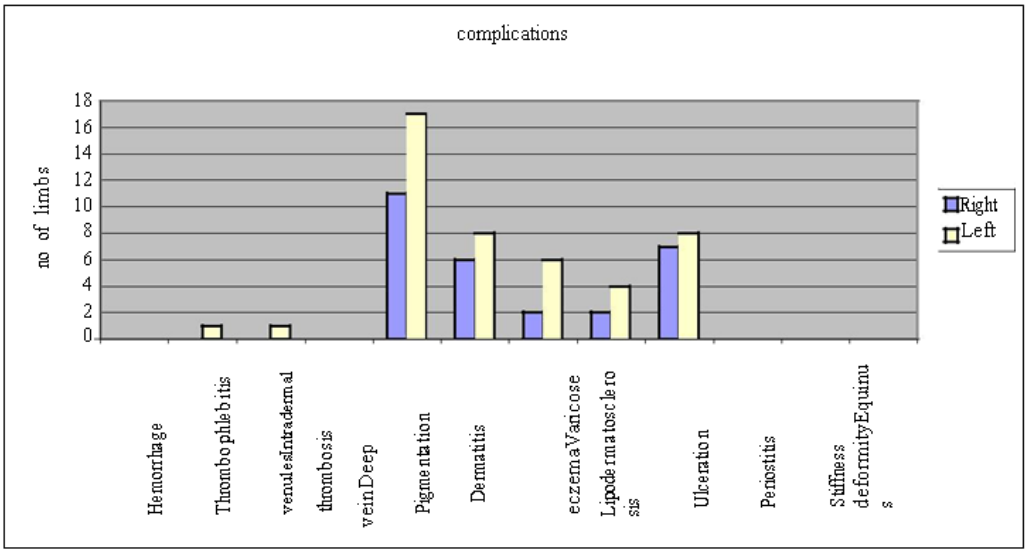


Complications:
Of the 70 limbs involved, 28 (40%) had pigmentation, 15(21.4%) had ulceration, 14 (20%) had dermatitis, 8 (11.4%) eczema, 6 (8.5%) had lipodermatosclerosis, 1(1.4%) had thrombophlebitis and intradermal venules.

Table 7 Distribution of Complications

Complications:	Right	Left	Total
Hemorrhage	0	0	0
Thrombophlebitis	0	1	1
Intradermal venules	0	1	1
Deep vein thrombosis	0	0	0
Pigmentation	11	17	28
Dermatitis	6	8	14
Varicose eczema	2	6	8
Lipodermatosclerosis	2	4	6
Ulceration	7	8	15
Periostitis	0	0	0
Stiffness	0	0	0
Equinus deformity	0	0	0
Chi square	**10.214**	**11.535**	**20.901**
P	**<. 037(S)**	**<. 021(S)**	**<. 000(S)**

Graph 7: Distribution of Complications



Treatment:

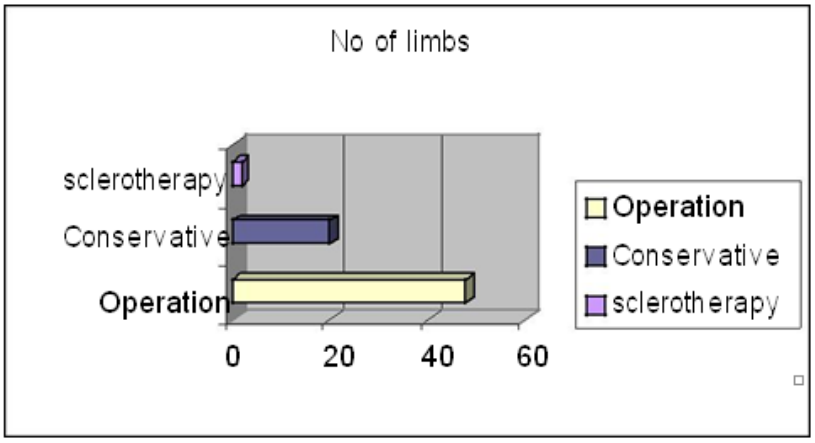
All patients with bilateral disease had symptoms only in one limb. The limb, which was symptomatic, was subjected to surgery and the other limb was conserved. Of the 70 limbs 48 (68.5%) were subjected to surgery. 20 (28.5%) underwent conservative treatment and 2 (2.8%) underwent sclerotherapy.

Table 8. Treatment

Treatment	Frequency	Percent
Operation	48	68.57
Conservative	20	28.57
Sclerotherapy	2	2.96
total	70	100

Chi square-46.057: P<. 000(S)

Graph-8: Treatment



Operation:

Of the 48 limbs that underwent surgery 26 (54.1%) underwent saphenofemoral flush ligation with stripping of LSV and subfascial ligation of perforators, 10 (20.8%) underwent saphenofemoral flush ligation and stripping.,4 (8.3%) underwent saphenofemoral flush ligation with stripping of LSV and saphenopopliteal junction ligation, 3 (6.25%) underwent subfascial ligation of perforators, 2 (4.1%) underwent saphenopopliteal junction ligation with subfascial ligation of perforators, 1 (2%), limb underwent saphenofemoral flush ligation with stripping of LSV, saphenopopliteal junction ligation and subfascial ligation of perforators.

Table 9. Distribution of Operations

Operation:	No of limbs	Percent
SFFL+S+SFLP	26	54.2
SFFL+S+SPJL	4	8.3
SPJL+SFLP	2	4.2
SFFL+S+SPJL+SFLP	1	2.1
SFLP	3	6.2
SFFL+S	10	20.8
SPJL	2	4.2
Total	48	100

Chi square70.125: P<. 000(S)

Graph-9: Distribution of Operations

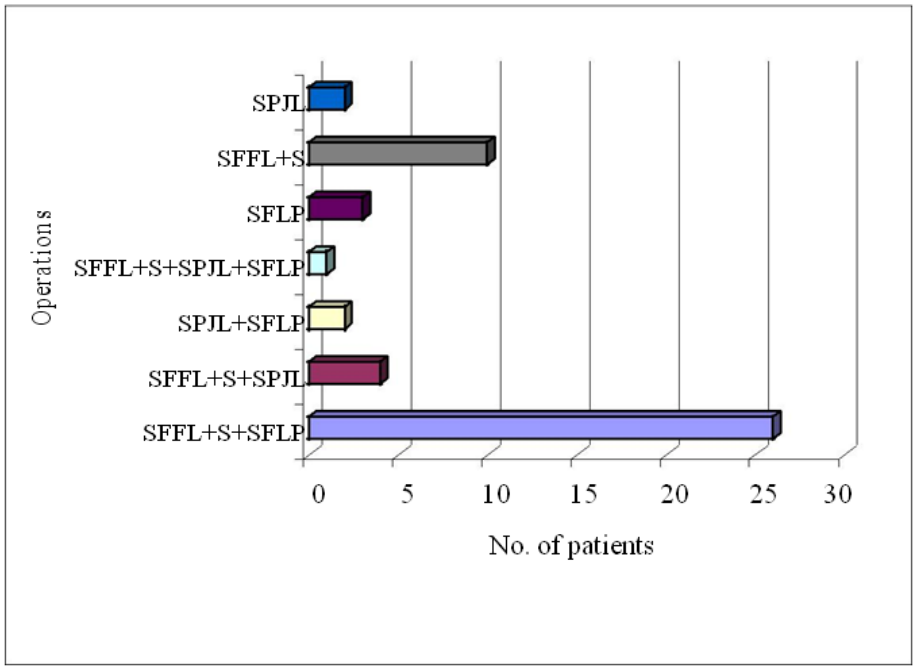
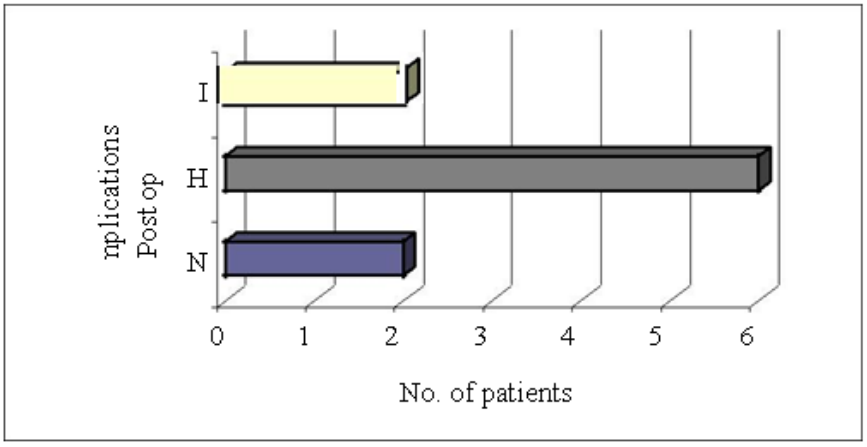


Table 10: Distribution of Post operative complications

Complications	No of patients	Percent
Haematoma	6	12.5
Neuritis	2	4.16
Infection	2	4.16

Chi square3.20: P<. 202(NS)

Graph-10:: Distribution of Post operative complications



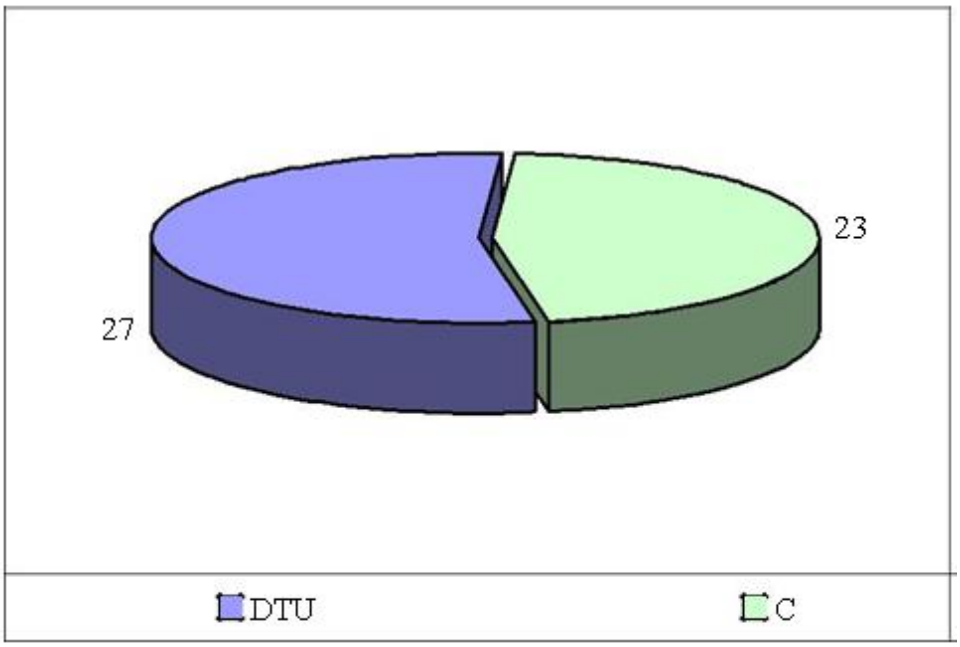
Follow-up:
Among 50 cases treated, 23 came for follow-up and were completely cured and 27 did not turn up.

Table 11. Follow-up

Follow-up	No of patients	Percent
Cured	23	46
Did not turn up	27	54
Total	50	100

Chi square.320: P<. 572(NS)

Graph-11: Follow-up



IV. Discussion

The incidence of varicose veins in females is three times more than in males. In this study of 50 patients, only 3 patients were females (6%). This is due to the fact that Indian women wear saree that covers their legs up to the feet, unlike western women whose costume wear may reveal their legs, hence Indian women are less concerned about the cosmetic disfigurement which may account for their decreased incidence.

In this study age incidence was maximum in the group 21-40 which accounted for 52% of patients followed by 18 patients (36%) in the age group 41-60.

In this study most of the patients were agriculturists (78%) by occupation who admitted of having been exposed to prolonged hours of standing, about 10 hours per day. This may point towards the possibility of prolonged erect posture being the aetiology for varicose veins.

Among the 70 limbs studied, commonest system involved was long saphenous and communicating system (32 limbs, 45.7%), next was long saphenous involvement alone (20, 28.5%), least involved was long, short and communicating system (1 limb, 1.4%). Left side was found to be involved more than the right side.

Among the various symptoms with which the patients presented, pain was the commonest symptom seen in 45 limbs (64.2%) followed by disfigurement 29 limbs (41.4%), ulcer 14 limbs (20%) oedema 12 limbs (17.1%). None of the patients had cramps.Of the various systems involved, limbs with long saphenous and communicating system involvement had more symptoms than any other (pain 24 limbs, 75%, disfigurement 18 limbs 56.2%, ulcer 8 limbs 25%, oedema 7 limbs 21.8%), followed by limbs with long saphenous and short saphenous involvement and long saphenous involvement alone. In a study conducted by [3]T. Sakurai, P.C. Gupta, M. Matsushita, N. Nishikimi and Y. Nimura, it was found that, of the 266 limbs examined, long saphenous and communicating system involvement was seen in 118(44%) and long saphenous involvement alone was seen in 56(21%). They showed that these were the commonest patterns involved. They also showed that limbs with long saphenous and short saphenous involvement or long saphenous and communicating system involvement were associated with severe venous disease.

Among the various complications pigmentation was the commonest seen in 28 limbs (40%) followed by ulceration 15 limbs (21.4%), dermatitis 14 limbs (20%), eczema 8 limbs (11.4%), lipodermatosclerosis 6 limbs (8.5%) haemorrhage, DVT, periostitis, stiffness and equinus were not seen in any of them.

Among the various modalities of treatment, 48 of 70 limbs were subjected to surgery, 20 were conserved and 2 were subjected to sclerotherapy. The commonest operation performed was saphenofemoral flush ligation with stripping of LSV and subfascial ligation of perforators in 26 limbs (54.1%), followed by saphenofemoral flush ligation with stripping of LSV 10 limbs (20.8%). Least common operation was saphenofemoral flush ligation with stripping of LSV with saphenopopliteal junction ligation with subfascial ligation of perforators (2%). Postoperative compression was followed routinely for all patients to prevent haematoma formation. All patients were advised to use elastic crepe bandage for 2 months after discharge from the hospital.

Among the postoperative complications haematoma, was the commonest (6 limbs 12.5%) probably due to loose application of postoperative compression bandage. 2 limbs had saphenous neuritis and 2 limbs had infection. Low incidence of neuritis could be because f good surgical technique and due to the fact that most patients were agriculturists who were not bothered by slight impairment of sensation. Low incidence of infection could be due to good antibiotic coverage coupled with sterile theatre technique.

The complications responded well to surgical treatment. Among 14 patients with varicose ulcer 6 needed grafting, rest healed without any intervention. Of the 50 patients 23 came for follow up and had no recurrence. 2 patients were subjected to sclerotherapy who never turned up.

V. Conclusions

50 patients of primary varicose veins of lower limbs were admitted to Govt. Thiruvarur Medical college andstudy of these patients revealed,

1) Commonest age group affected is 21-40 years
2) Definite relationship exists between occupation involving prolonged standing and primary varicose veins.
3) The involvement of long saphenous and communicating system is commonest followed by long saphenous involvement alone.
4) Pain is the commonest symptom.
5) Patients with involvement of long saphenous and communicating system or long saphenous and short saphenous system had more symptoms than the others.
6) Commonest complication is pigmentation.
7) Complications of varicose veins responded well to operative treatment. Results of surgical treatment are good.
8) Mortality is nil

VI. Summary

In this clinical study of primary varicose veins and its complications all cases of varicose veins presenting to the OPD were subjected to duplex scan. Patients admitted with varicose vein who satisfied the inclusion and exclusion criteria were included in the study. Cases with complications were initially treated conservatively and later subjected to operative treatment. Patients who presented with bilateral varicose veins got their symptomatic limbs operated first while the other limb was treated conservatively. Patients with saphenofemoral incompetence were treated with saphenofemoral junction ligation and stripping of long saphenous vein. Patients with saphenopopliteal junction incompetence were treated with saphenopopliteal junction ligation with or without stripping of short saphenous vein. Patients with perforator incompetence were treated with subfascial ligation of perforators. Patients with recurrent varicosities, residual varicosities and isolated perforator incompetence were subjected to sclerotherapy.

From this study we conclude that commonest age group affected is 21-40 years. Definite relationship exists between occupation involving prolonged standing and primary varicose veins. The involvement of long saphenous and communicating system is commonest followed by long saphenous involvement alone. Pain is the commonest symptom. Patients with involvement of long saphenous and communicating system or long saphenous and short saphenous involvement were more symptomatic than the others. Commonest complication is pigmentation. Complications of varicose veins responded well to operative treatment. Results of surgical treatment are good.

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