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A STUDY ON ASSESSMENT OF CLINICAL RISK PROFILE OF DEEP VEIN THROMBOSIS PATIENTS AND ITS THERAPEUTIC MANAGEMENT IN A TERTIARY CARE HOSPITAL

Dayala Ravi kiran[1], D. Jothieswari[2*]

[1]Research Scholar, Sri Venkateswara College of Pharmacy Chittoor (A), Research scholar JNTUA, E-mail: darlingravi19@gmail.com, Orchid Id: https://orcid.org/0009-0000-7177-9734
[2]Professor, Sri Venkateswara College of Pharmacy Chittoor (A), E-mail: drjothieswari@svcop.in, Orchid Id: https://orcid.org/0000-0002-1352-0756

ABSTRACT
Background: Deep vein thrombosis (DVT) is occurred by presence of blood clot in the lower limbs.
Aim: The study aims to assess clinical risk profile of deep vein thrombosis patients and its therapeutic management in a tertiary care hospital.
Methodology: The prospective observational study was carried out for a period of 6 months. The study was conducted in General medicine department in a tertiary care hospital. A written and informed consent was obtained from the recruited patients. A Total of 225 patients were enrolled in the study.
Results and Discussion: In our study 26-36 years age patients were more 85(37.77%) as compared to other ages. In our study Risk factors for deep vein thrombosis includes Heart failure risk factor patients were more 52(23.11%), as compared to other risk factors. Clinical symptoms of DVT includes skin changes patients were more 58(25.77%) as compared to other clinical symptoms. Deep Veins Involved in DVT includes External Iliac vein patients were more 78(34.66%) as compared to other deep veins. Drug prescribing pattern for DVT management includes Heparin prescribed patients were more 89(39.55%), as compared to other drug prescribed drugs.
Conclusion: Successful implementation of DVT prophylaxis guidelines, incorporation of risk assessment stratification tools, awareness programmes can decrease the progression of DVT in the community

KEYWORDS: Deep vein thrombosis, Risk factor, Blood clot, External Iliac vein, Heparin.

INTRODUCTION
Deep vein thrombosis is occurred by presence of blood clot in the lower limbs. The clinical condition can be provoked by surgery, trauma, prolonged bed rest, use of oral contraceptive medicines. It is estimated that yearly incidence of venous thromboembolism cases was actively reporting 10 million in globally. Deep vein thrombosis is an obstructive disease which represents alteration in flow of blood in veins. Deep vein thrombosis majorly present in distal veins, popliteal, femoral, common femoral, and iliac veins. It exhibits death occurring from cardiovascular disease after heart attacks and stroke cases. Deep-vein thrombosis is a major medical problem which accounts for pulmonary embolism1-4.
The proper detection of cases in early stages and proper treatment can lower the morbidity. The common risk factors for Deep vein thrombosis includes obesity, older age, pregnancy, surgery, dehydration, long term hospitalization, hormone replacement therapy, lower extremity injury and cancer. Deep-vein thrombosis and pulmonary emboli both conditions are emerging silently and diagnosed only at autopsy evidence. The annual incidence of DVT is 80 cases per 100,000, with a prevalence of lower limb DVT of 1 case per 1000 population. Thrombosis can prevent the loss of blood and seal off damaged blood vessels; fibrinolysis can stabilize the thrombosis formation.
The triggers of venous thrombosis are multifactorial and different parts of the triad of Virchow can shows early thrombus interaction with the endothelium. It stimulates local cytokine production and causes leukocyte adhesion to the endothelium, promotes venous thrombosis and depends on interaction between coagulation and thrombolytic pathways, thrombus propagation occurs. The clinical symptoms of DVT varies with the presence and location of a thrombus. The cardinal signs and symptoms of DVT include asymmetrical swelling, warmth, or pain in an extremity, and a high index of suspicion is present in patients with the aforementioned risk factors5-8. A number of scoring systems have been devised to estimate the pre-test probability of DVT. The clinical presentation of DVT varies with the extent and location of a thrombus. The presence of severe thrombus in proximal deep veins, mechanical and catheter-directed thrombolysis seen in acute phase which can further induce clot lysis and lowers the post-thrombotic syndrome burden. DVT is diagnosed through available test includes D-dimer assay, CT, and MRI scan etc. The treatment of DVT has been incorporated with warfarin with heparin drugs should be followed. Therefore, the objective of this study was to investigate the clinical risk factors profile and investigating the treatment patterns of DVT cases in the society. Patients having comorbid conditions such as diabetes mellitus or obesity are at greater risk of developing deep vein thrombosis, and immediate further preventive measures could be followed. The presence of blood clot in lower leg can restricts the flow of blood circulation causes leg pain, swelling, redness of the leg occurs. Preventing deep vein thrombosis which involves

a combination of plan which can reduce the risk of blood clot formation and relies on medications and mechanical therapy. Deep vein thrombosis preventive steps target on improving blood circulation and reducing risk factors through regular leg movement practice, weight management, and avoiding long periods of physical inactivity, walking frequently, wearing compression stockings, avoiding smoking and alcohol practices can minimize the future complications of deep vein thrombosis.

Aim and Objectives:
Aim: The study aims to assess clinical risk profile of deep vein thmbosis patients and its therapeutic management in a tertiary care hospital.

Objectives:
- To study the demographic profile of deep vein thmbosis patients.
- To investigate the risk factors, clinical profile of deep vein thmbosis patients.
- To assess the drug prescribing pattern for deep vein thmbosis patients.

METHODOLOGY
The prospective observational study was carried out for a period of 6 months. The study was conducted in General medicine department in a tertiary care hospital. A written and informed consent was obtained from the recruited patients. A Total of 225 patients were enrolled in the study.

Inclusion criteria
- Patients with age of more than 18 years.
- Patients who are willing to give consent.
- Patients of either sex, diagnosed with deep vein thrombosis.
- Patients receiving treatment for deep vein thrombosis.
- Patients with clinical risk factors of deep vein thrombosis.

Exclusion criteria
- Patients below 18 years.
- Patients who were not willing to join in the study.
- Special population including pregnant women and lactating women.
- Psychiatric abnormalities.

Institutional ethics committee (IEC) consideration:
The research protocol was approved by Ethical committee was permitted to perform the research work in the selected department of a tertiary care hospital. (IEC Number:12233333).

Patient data collection and management:
The data collection form contains age, sex, past medical history, laboratory data, and diagnosis, dose and duration of therapy was collected from the patients treatment chart.

Statistical analysis:
The data was represented as percentages.

RESULTS

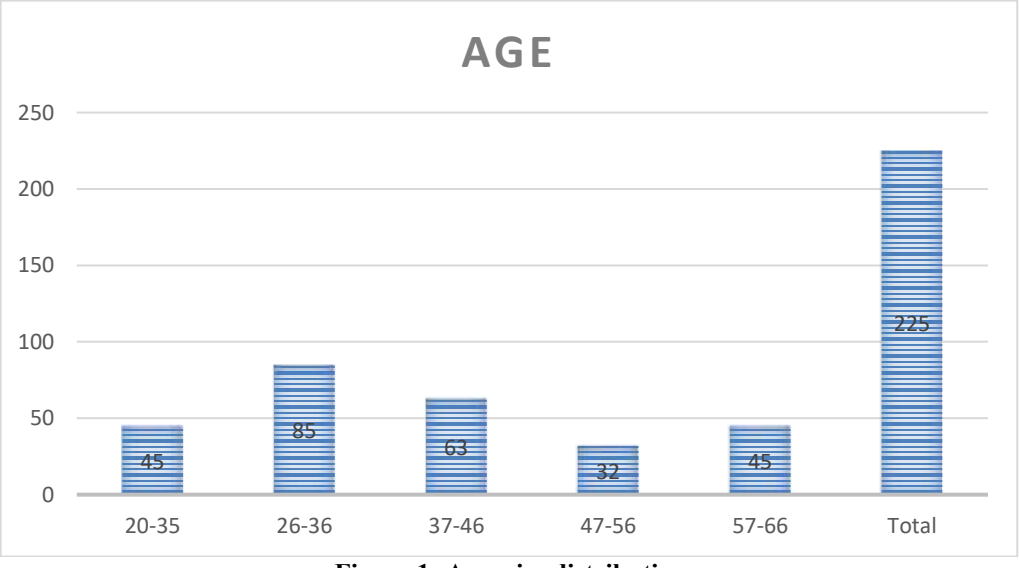

Figure 1: Age wise distribution

Table 1: Age wise distribution

S.No	Age	Total (N=225)	Percentage (%)
1	20-35	45	20
2	26-36	85	37.77
3	37-46	63	28
4	47-56	32	14.22
5	57-66	45	20
6	Total	225	

In our study 20-35 years age patients were 45(20%), 26-36 years age patients were 85(37.77%), 37-46 years age patients were 63(28%), 47-56 years age patients were 32(14.22%), 57-66 years age patients were 45(20%).

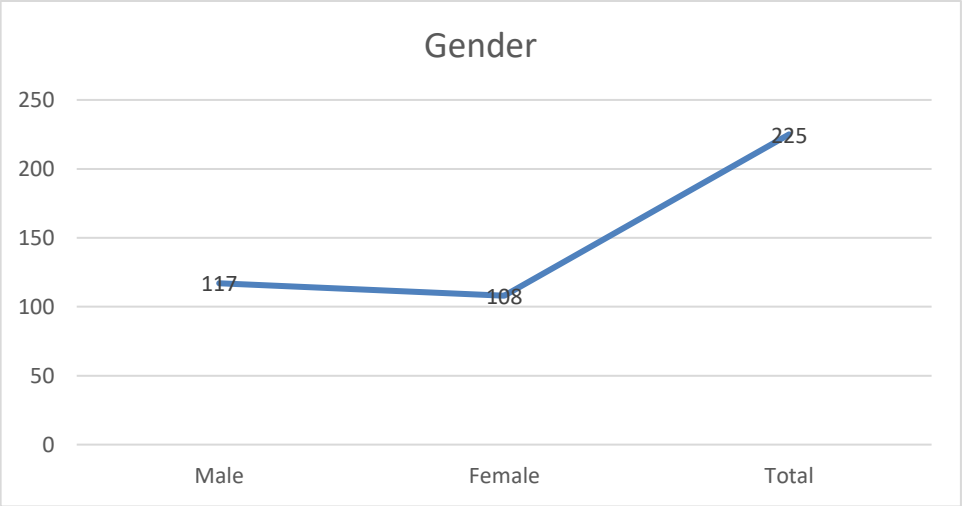

Figure 2: Gender

Table 2: Gender

S.No	Gender	Total (N=225)	Percentage (%)
1	Male	117	52
2	Female	108	48
3	Total	225	

In our study male patients were 117(52 %), female patients were 108(48 %).

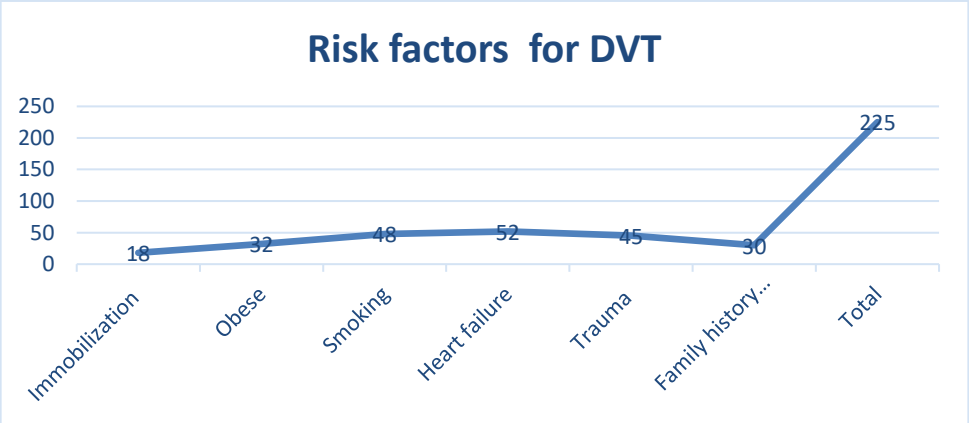

Figure 3: Risk factors for DVT

Table 3: Risk factors

S.No	Risk factors	Total (N=225)	Percentage (%)
1	Immobilization	18	8
2	Obese	32	14.22
3	Smoking	48	21.33
4	Heart failure	52	23.11
5	Trauma	45	20
6	Family history	30	13.33

	of DVT		
7	Total	225	

In our study Risk factors for deep vein thrombosis includes Immobilization risk factor patients were 18(8%), Obese risk factor patients were 32(14.22%), Smoking risk factor patients were 48(21.33%), Heart failure risk factor patients were 52(23.11%), Trauma risk factor patients were 45(20%), Family history of DVT risk factor patients were 30(13.33%).

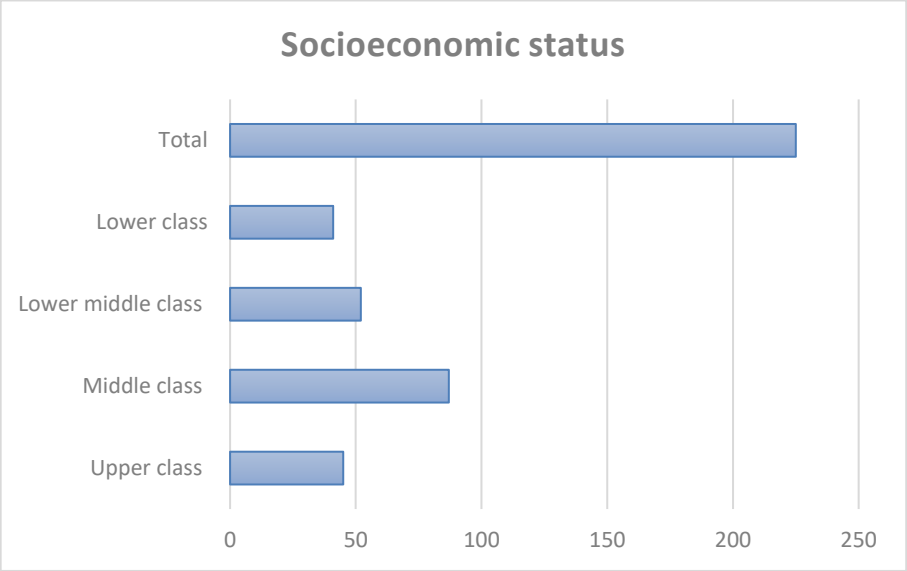

Figure 4: Socioeconomic status

Table 4: Socioeconomic status

S.No	Socioeconomic status	Total (N=225)	Percentage (%)
1	Upper class	45	20
2	Middle class	87	38.66
3	Lower middle class	52	23.11
4	Lower class	41	18.22
5	Total	225	

Socioeconomic status includes Upper class patients were 45(20%), Middle class patients were 87(38.66%), Lower middle class patients were 52(23.11%), Lower class patients were 41(18.22%).

Table 5: Complications of DVT

S.No	Complications	Total (N=225)	Percentage (%)
1	Seroma	25	11.11
2	Infection	71	31.55
3	Limb oedema	41	18.22
4	Paraesthesia	28	12.44
5	Delay healing	39	17.33
6	Residual varicosity	21	9.33
7	Total	225	

In our study Complications for DVT includes Seroma patients were 25(11.11%), Infection patients were 71(31.55%), Limb oedema patients were 41(18.22%), Paraesthesia patients were 28(12.44%), Delay healing patients were 39(17.33%), Residual varicosity patients were 21(9.33%).

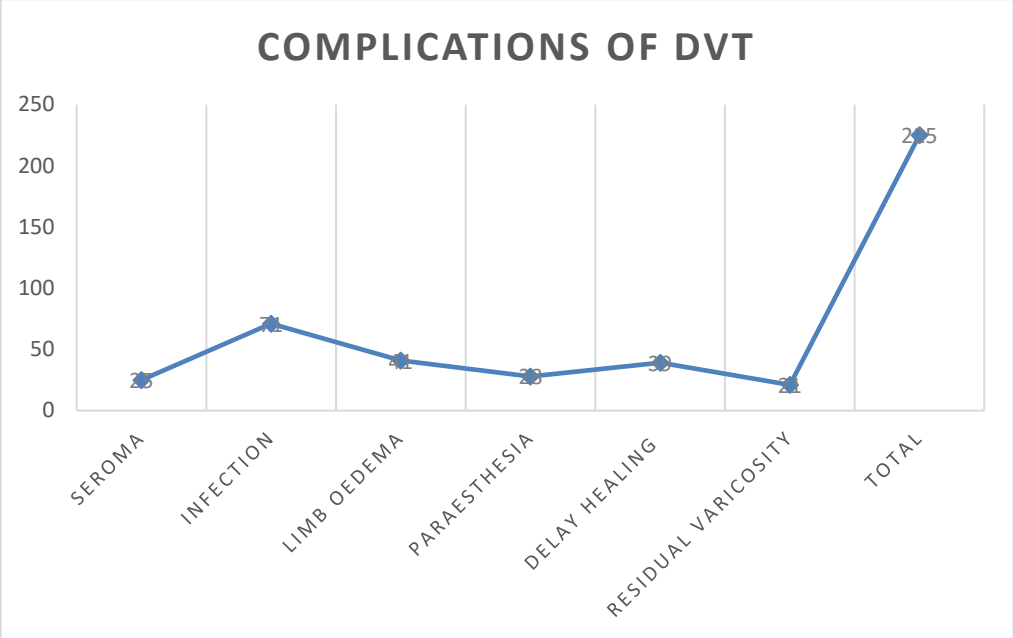

Figure 5: Complications of DVT

Table 6: Clinical symptoms of DVT

S.No	Clinical symptoms of DVT	Total (N=225)	Percentage (%)
1	Swelling	25	11.11
2	Skin changes	58	25.77
3	Edema	36	11.55
4	Dilated veins	38	16.88
5	Pain in the legs	45	250
6	Darkening of skin (Ankle)	23	10.22
7	Total	225	

Clinical symptoms of DVT includes Swelling patients were 25(11.11%), Skin changes patients were 58(25.77%), Edema patients were 36(11.55%), Dilated veins patients were 38(16.88%), Pain in the legs patients were 45(250%), Darkening of skin (Ankle) patients were 23(10.22%).

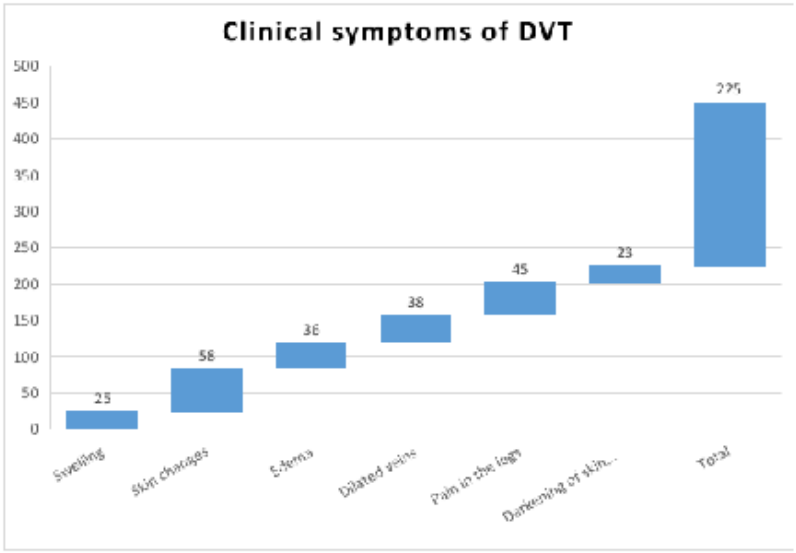

Figure 6: Clinical symptoms of DVT

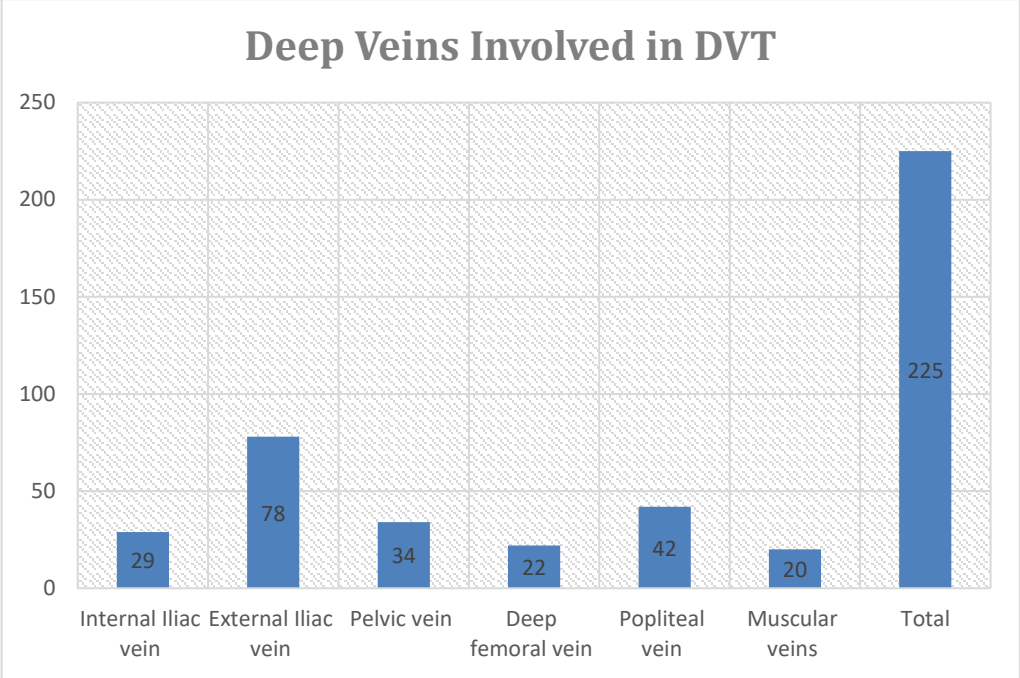

Figure 7: Deep Veins Involved in DVT

Table 7: Deep Veins Involved in DVT

S.No	Duration of Hospital stay	Total (N=225)	Percentage (%)
1	Internal Iliac vein	29	12.88
2	External Iliac vein	78	34.66
3	Pelvic vein	34	15.11
4	Deep femoral vein	22	9.77
5	Popliteal vein	42	18.66
6	Muscular veins	20	8.88
7	Total	225	

Deep Veins Involved in DVT includes Internal Iliac vein patients were 29(12.88%), External Iliac vein patients were 78(34.66%), Pelvic vein patients were 34(15.11%), Deep femoral vein patients were 22(9.77%), Popliteal vein patients were 42(18.66%), Muscular veins patients were 20(8.88%).

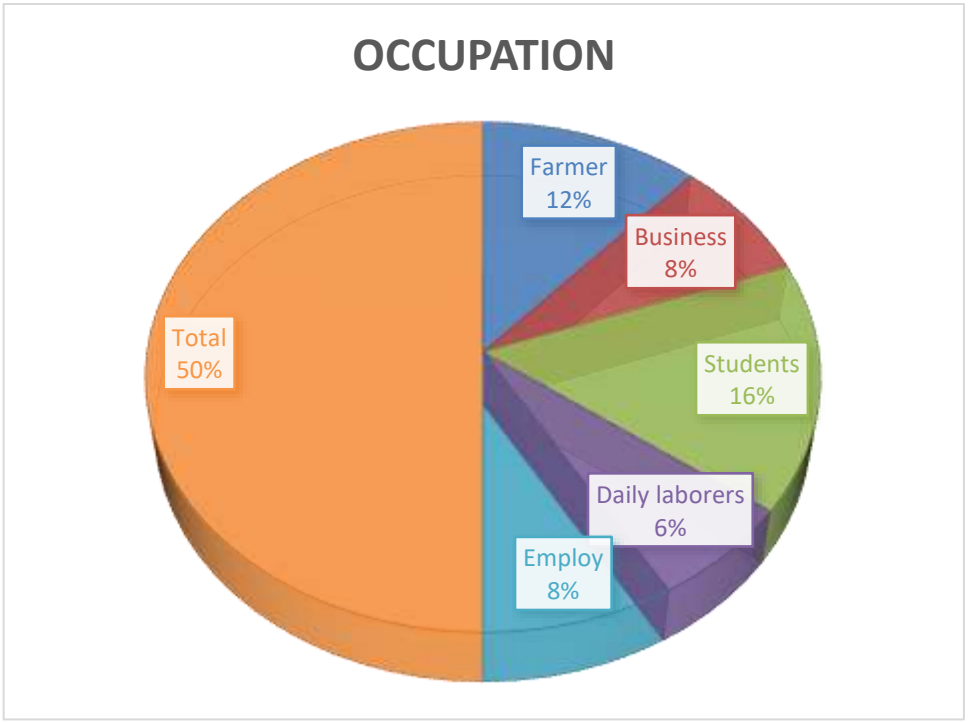

Figure 8: Occupation

Table 8: Occupation

S.No	Occupation	Total (N=225)	Percentage (%)
1	Farmer	52	23.11
2	Business	35	15.55
3	Students	71	31.55
4	Daily laborers	29	12.88
5	Employ	38	16.88
6	Total	225	

In our study occupation wise details includes Farmer occupation patients were 52(23.11%),Business occupation patients were 35(15.55%), Students occupation patients were 71(31.55%), Daily laborers occupation patients were 29(12.88%), Employ occupation patients were38(16.88%).

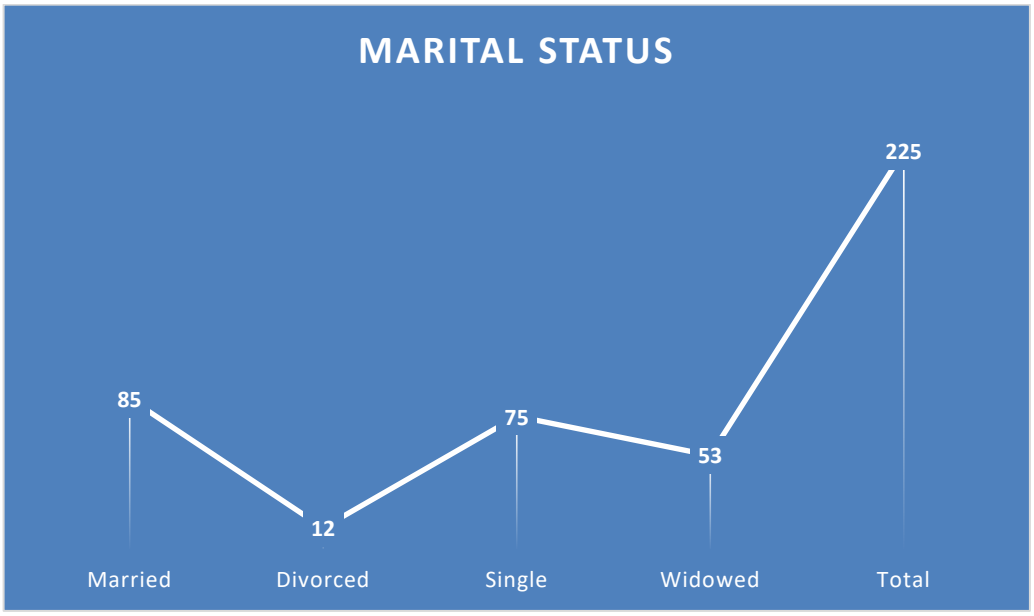

Figure 9: Marital status

Table 9: Marital status

S.No	Marital status	Total (N=225)	Percentage (%)
1	Married	85	37.77
2	Divorced	12	5.33
3	Single	75	33.33
4	Widowed	53	23.55
5	Total		

Marital status of study participants includes Married were 85(37.77%), Divorced were 12(5.33%), ingle were 75(33.33%), Widowed were 53(23.55%).

Table 10: Duration of illness

S.No	Duration of illness	Total (N=225)	Percentage (%)
1	1-10 days	42	18.66
2	11-15 days	85	37.77
3	16-20 days	73	32.44
4	21-30 days	25	11.11
5	Total	225	

Duration of illness classification includes 1-10 days duration illness patients were 42(18.66%), 11-15 days duration illness patients were 85(37.77%), 16-20 days duration illness patients were 73(32.44%), 21-30 days duration illness patients were 25(11.11%).

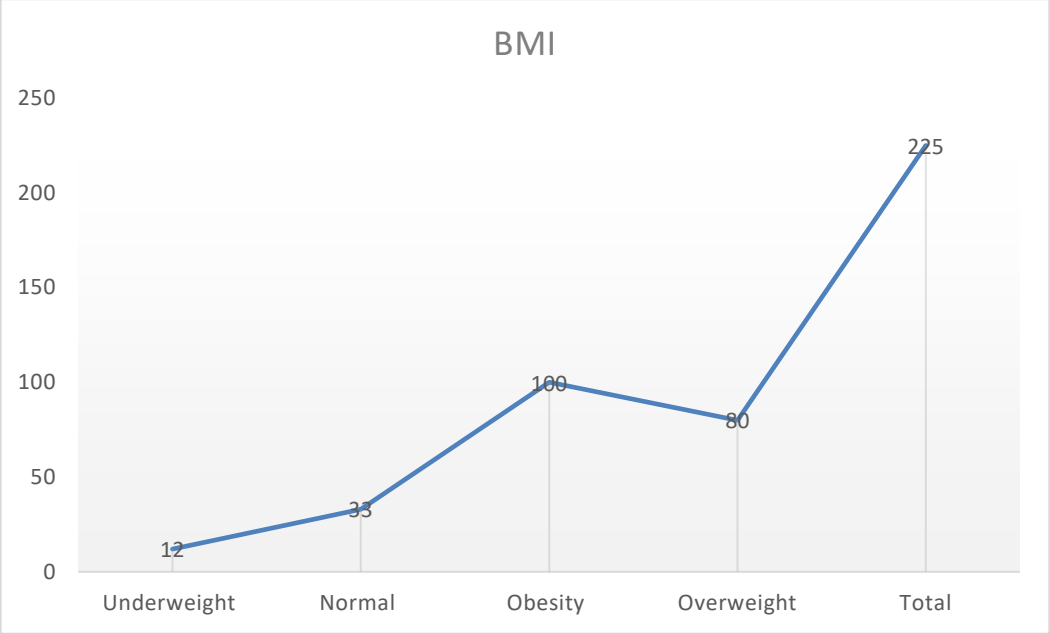

Figure 11: BMI

Table 11: BMI

S.No	Drug therapy	Total (N=225)	Percentage (%)
1	Underweight	12	5.33
2	Normal	33	14.66
3	Obesity	100	44.44
4	Overweight	80	35.55
5	Total	225	

BMI categorization includes Underweight patients were 12(5.33%), Normal patients were 33(14.66%), Obesity patients were 100(44.44%), Overweight patients were 80(35.55%).

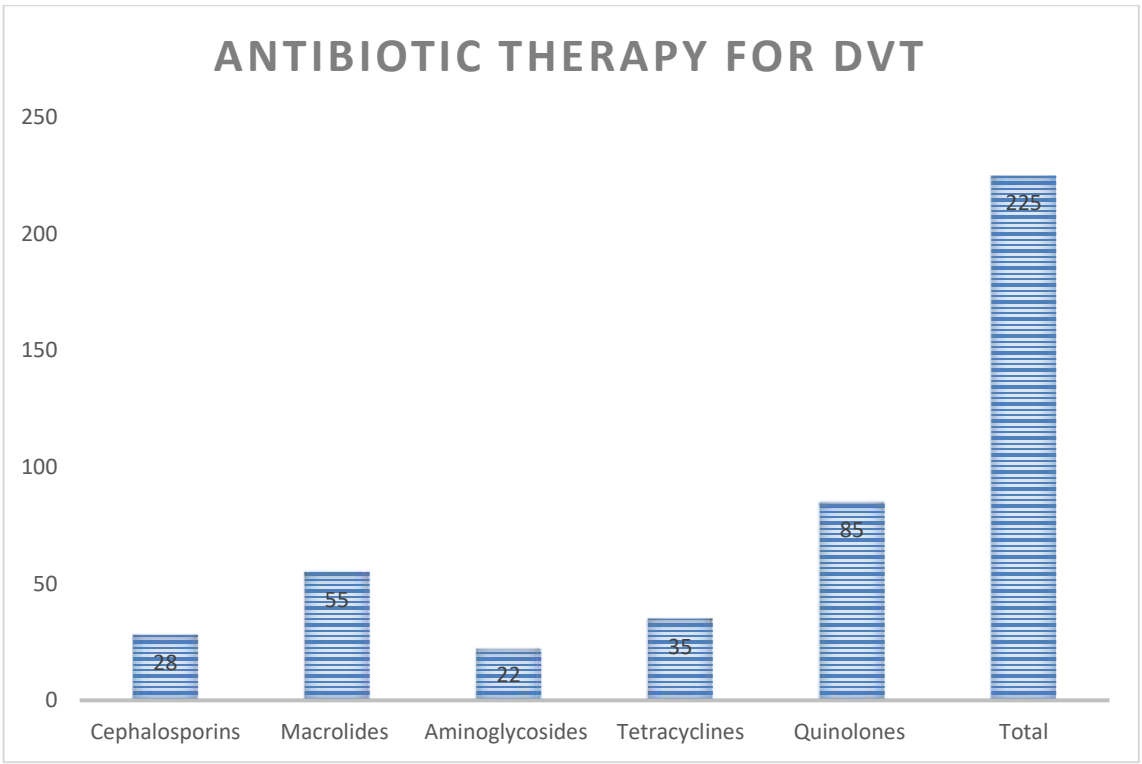

Figure 12: Antibiotic therapy for DVT

Table 12: Antibiotic therapy for DVT

S.No	Antibiotic therapy for DVT	Total (N=225)	Percentage (%)
1.	Cephalosporins	28	12.44
2.	Macrolides	55	24.44
3.	Aminoglycosides	22	9.77
4.	Tetracyclines	35	15.55
5.	Quinolones	85	37.77
	Total	**225**	

Antibiotic therapy for DVT patients includes Cephalosporins prescribed patients were 28(12.44%), Macrolides prescribed patients were 55(24.44%), Aminoglycosides prescribed patients were 22(9.77%), Tetracyclines prescribed patients were 35(15.55%), Quinolones prescribed patients were 85(37.77%).

Table 13: Lab test for DVT

S.No	Lab test	Total (N=225)	Percentage (%)
1	Blood test	48	21.33
2	D-Dimer test	94	41.77
3	Venography	24	10.66
4	C-reactive protein	30	13.33
5	Erythrocyte Sedimentation Rate	29	12.88
6	Total	225	

Lab test for DVT includes Blood test patients were 48(21.33%), D-Dimer test patients were 94(41.77%), Venography patients were 24(10.66%), C-reactive protein patients were 30(13.33%), Erythrocyte Sedimentation Rate patients were 29(12.88%).

Table 14: Duration of hospital stay (in days)

S.No	Lab test	Total (N=225)	Percentage (%)
1	1-6 days	85	37.77
2	7-10 days	63	28
3	11-15 days	42	18.66
4	16-30 days	35	15.55
5	Total	225	

Duration of hospital stay includes 1-6 days duration of hospital stay patients were 85(37.77%), 7-10 days duration of hospital stay patients were 63(28%), 11-15 days duration of hospital stay patients were 42(18.66%), 16-30 days duration of hospital stay patients were 35(15.55%).

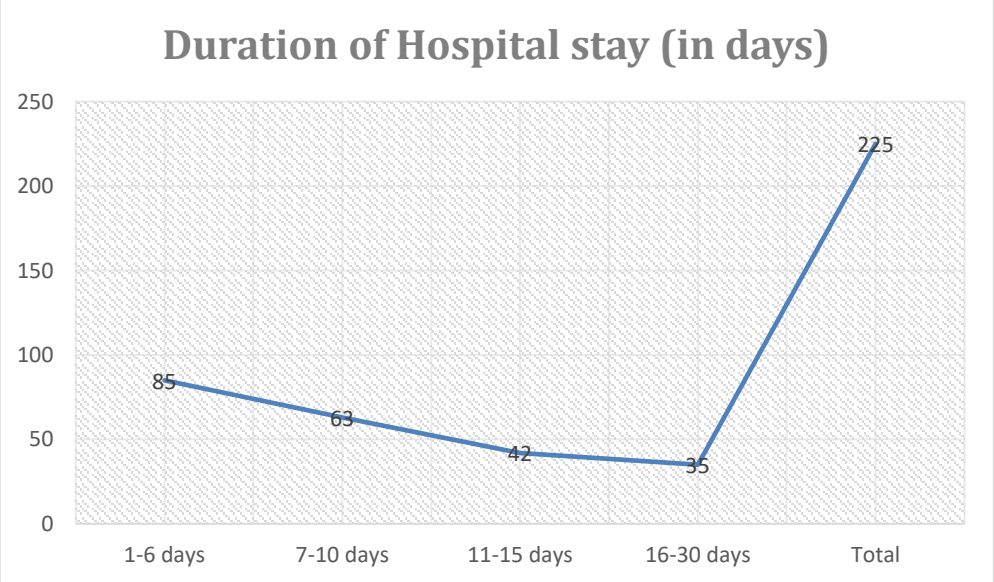

Figure 14: Duration of Hospital stay (in days)

Table 15: Type of work

S.No	Lab test	Total (N=225)	Percentage (%)
1	Heavy	125	55.55
2	Moderate	65	28.88
3	Sedentary	35	15.55
4	Total	225	

Type of work patients includes Heavy work patients were 125(55.55%), Moderate work patients were 65(28.88%), sedentary work patients were 35(15.55%).

Table 16: Drug prescribing pattern for DVT management

S.No	Prescribed drugs	Total (N=225)	Percentage (%)
1	Heparin	89	39.55
2	Enoxaparin	37	16.44
3	Dalteparin	52	23.11
4	Warfarin	20	8.88
5	Rivaroxaban	27	12
6	Total	225	

Drug prescribing pattern for DVT management includes Heparin prescribed patients were 89(39.55%), Enoxaparin prescribed patients were 37(16.44%), Dalteparin prescribed patients were 52(23.11%),Warfarin prescribed patients were 20(8.88%), Rivaroxaban prescribed patients were 27(12%).

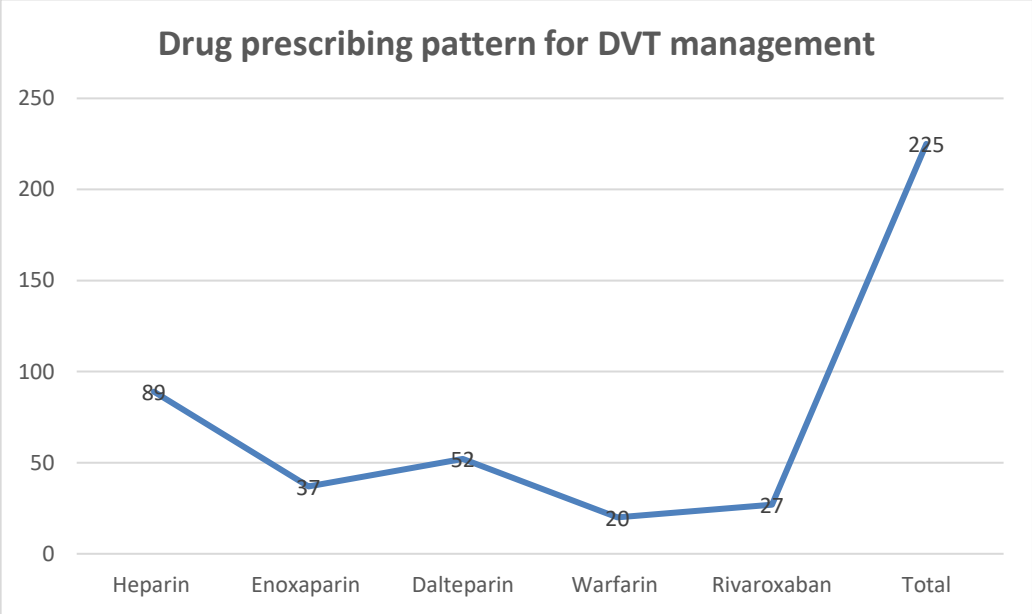

Figure 16: Drug prescribing pattern for DVT management

DISCUSSION

- In our study 26-36 years age patients were more 85(37.77%) as compared to other ages.
- In our study male patients were more 117(52 %), as compared to female patients were 108(48 %).
- In our study Risk factors for deep vein thrombosis includes Heart failure risk factor patients were more 52(23.11%), as compared to other risk factors. A study by Ghanshyam Rathore et al., 2024. The study concluded that the early assessment of risk factors can predict the occurrence of DVT9. Preventive interventions and personalized risk stratification steps can crucial for moderate and high-risk DVT categories. Our study results meet with similar study conducted by Vinod Khandait et al., 2019 states that Young adults are more affected with DVT therefore deep evaluation of risk factors of deep vein thrombosis is required10.
- Socioeconomic status includes Middle class patients were more 87(38.66%) as compared to other Socioeconomic status of patients.
- In our study complications for DVT includes Infection patients were more 71(31.55%) as compared to other complications.
- Clinical symptoms of DVT includes skin changes patients were more 58(25.77%) as compared to other clinical symptoms.

• Deep Veins Involved in DVT includes External Iliac vein patients were more 78(34.66%) as compared to other deep veins.
• In our study occupation wise details includes student's occupation patients were more 71(31.55%) as compared to other occupation.
• Marital status of study participants includes Married were more 85(37.77%) as compared to other marital status of study participants.
• Duration of illness classification includes 11-15 days duration illness patients were more 85(37.77%) as compared to other Duration of illness of participants.
• BMI categorization includes Obesity patients were more 100(44.44%), as compared to other BMI categories. Varsha S et al., 2018. Patients with normal BMI and mild obesity were affected, showing that in Indian population, obesity only may have small contribution11.
• Antibiotic therapy for DVT patients includes Quinolones prescribed patients were more 85(37.77%) as compared to other antibiotic therapies.
• Lab test for DVT includes D-Dimer test patients were more 94(41.77%) as compared to other lab investigations12-14.
• Duration of hospital stay includes 1-6 days duration of hospital stay patients were more 85(37.77%) as compared to other hospital duration of study patients.
• Type of work patients includes Heavy work patients were more 125(55.55%) as compared to other work nature of patients15-17.
• Drug prescribing pattern for DVT management includes Heparin prescribed patients were more 89(39.55%), as compared to other drug prescribed drugs. Our study results meet with similar study conducted by Abdalhabib et al., 2022. natural coagulation inhibitors and fibrinolytic inhibitors can prevent the DVT occurrence18. Our study results meet with similar study conducted by Rajiv Ranjan et al., 2018 states that Irrespective of the etiology the prescribing of LMWH should be continued and which has good safety, efficacy19.

CONCLUSION

The study findings suggest that there is a need for preventive interventions and personalized risk stratification for moderate, high-risk patients. Timely disease screening programs and a thorough patient education can help for the treatment of DVT at early stages. Novel diagnostic tools, regular updating of health care policies can helpful in real-time monitoring of disease20-23. Our study mild obesity was affected so that obesity has vital contribution in progressing the disease. Increasing availability of new therapeutic modalities are likely to improve the diagnosis of disease. Early recognition and appropriate therapy would improve the outcomes of the diseases. DVT is one of the most common vascular disease which is linked with a high morbidity rate24. The expected cause of DVT is not known, however environmental and genetic factors can aggravate the risk of DVT. Early detection of clinical risk factors and early initiation of appropriate thromboprophylaxis measures can prevent the mortality of deep vein thrombosis25-26. The prevalence of DVT was found to be high, and close attention is required for preventing the complications of DVT. Successful implementation of DVT prophylaxis guidelines, incorporation of risk assessment stratification tools, awareness programmes can decrease the progression of DVT in the community.

Limitations

• The study was conducted for a short period of time.
• The clinical laboratory test reevaluation was not studied.
• Treatment drugs adverse drug reaction was not studied.
• The patient's treatment follow-up was not studied.

Future study Recommendations

The study recommends that there is a need for clinical policies, treatment policies can prevent the further complications of deep vein thrombosis. Designing of risk screening, diagnostic tools can assist to identify the prompt risk of deep vein thrombosis. Health care practitioners must adhere to treatment guidelines, regular medical education training programmes can minimize the future occurrence of the disease events in the community.

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