STUDY OF CLINICAL PROFILE OF THE PATIENTS WITH DEEP VEIN THROMBOSIS AND ITS RESPONSE TO LOW MOLECULAR WEIGHT HEPARIN

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ABSTRACT:

Background: Deep vein thrombosis of the lower extremity is a leading cause of in-hospital mortality. Complications of deep vein thrombosis include pulmonary embolism, recurrent episodes of deep vein thrombosis, and the development of post-thrombotic syndrome. Low-molecular-weight heparins have longer half life, more predictable anticoagulant response and are suitable for subcutaneous administration without laboratory monitoring. **Objective:** The objectives of the study were to study the clinical profile of patients with deep vein thrombosis and to assess the clinical response to low molecular weight heparin **Methods:** A total of 50 patients who were admitted to the medicine wards of Patna Medical College Hospital Patna and confirmed to be having deep vein thrombosis by compression grey scale ultrasound of deep veins of lower limbs were studied with the above objectives. **Results:** Study included patients of age group between 18 years to 86 years. Mean age of the patients in our study was 45.56 +/- 14.65 years. There was female predominance with male to female ratio of 0.6:1. Average BMI was in overweight range. Immobilization longer than 3 days was present in 40% of the patients. Pregnancy and the postpartum period was present in 20%of the patients.10% of the patients had history of surgery in last 12 weeks. Previous history of DVT was present in 4 % of patients. Cancer accounted for 12% of patients.16% patients had history of trauma to involved limb. Symptoms of DVT were Pain, local swelling and redness/discoloration.Clinical Signs observed were swelling, increased local temperature, discoloration, tenderness, Homan's sign. Statistically significant improvement in the objective clinical signs of deep vein thrombosis after treatment with low molecular weight heparin enoxaparin was seen after seven days of treatment with low molecular weight heparins. **Conclusions:** Major risk factors for deep vein thrombosis are immobilization longer than 3 days, pregnancy and the postpartum period ,major surgery in previous 12 weeks, cancer and trauma. Common clinical features of DVT

are pain, swelling, tenderness, discoloration and increased local temperature.Low molecular weight heparin enoxaparin is effective in treatment of DVT.

INTRODUCTION

Deep vein thrombosis of the lower extremity is a major cause of in-hospital mortality.Establised risk factors for disease include surgery,obesity,trauma,pregnancy and post-partum period, immobilization and malignancy.Complications of deep vein thrombosis include pulmonary embolism, recurrent episodes of deep vein thrombosis, and the development of post-thrombotic syndrome.Lower extremity Deep-vein thrombosis usually begins in the calf and propagates proximally to the popliteal vein,femoral vein and iliac veins. There is venous outflow obstruction and inflammation of the vessel wall and surrounding tissue. When deep venous thrombi detach from their site of formation, they embolize to the vena cava, right atrium, and right ventricle, and lodge in the pulmonary arterial circulation, thereby causing acute Pulmonary Embolism (1). Paradoxically, these thrombi occasionally embolize to the arterial circulation through a patent foramen ovale or atrial septal defect. Ultrasonography of the deep-venous system relies on loss of vein compressibility as the primary diagnostic criterion for DVT (2). When a normal vein is imaged in cross-section, it readily collapses with gentle manual pressure on the ultrasound transducer. With acute DVT, the vein loses its compressibility because of passive distention by acute thrombus. The diagnosis of acute DVT is even more secure when thrombus is directly visualized. It appears homogeneous and has low echogenicity. The vein itself often appears mildly dilated, and collateral channels may be absent. Venous flow dynamics can be examined with Doppler imaging. Normally, manual calf compression causes augmentation of the Doppler flow pattern. Loss of normal respiratory variation is caused by an obstructing DVT or by any obstructive process within the pelvis. Previously unfractionated heparin was used for treatment of DVT. Unfractionated heparin required frequent laboratory monitoring with appropriate dose adjustment to keep their level of anticoagulation in the therapeutic range. Low-molecular-weight heparin have longer half life, more predictable anticoagulant response and are suitable for subcutaneous administration without laboratory monitoring. The present study aims to see the clinical profile of patients with deep vein thrombosis and to evaluate the response with use of low molecular weight heparin in prospective observational blinded endpoint study.

MATERIALS AND METHODS:

Type of study: Prospective observational blinded endpoint study

Place of study: Department of medicine, PMCH, Patna , Bihar

Duration of study: Two year (January 2019- December 2020)

Inclusion criteria:

1. Patients with acute proximal/distal deep vein thrombosis, confirmed by Doppler compression ultrasonography.

2. Patients willing to participate in the study.

Exclusion criteria:

1. Currently active bleeding.

2. Recent history of hemorrhagic stroke

Number of patients: A total of 50 patients who were confirmed to be having deep vein thrombosis by compression grey scale ultrasonography of deep veins of lower limbs constituted the study population.

Investigations:

Complete blood count, Liver function tests, Renal function tests, Fasting blood glucose, Fasting lipid profile, X-Ray Chest, ECG, Prothrombin time, Activated partial thromboplastin time,INR,B-mode Doppler compression ultrasonography

Statistical analysis:

Statistical analysis was done using SPSS software (Version 23) and the Statistical tools in Microsoft Excel 2010. Continuous data were presented as means and standard deviation (SD) or with 95% confidence intervals (CIs), Differences by groups were analyzed with Student's test for unpaired samples. Correlation has been established by univariate and multivariate analysis and linear regression analysis using Pearson correlation coefficient. p value lower than 0.05 was considered significant.

RESULTS

AGE

The Mean age of the patients was 45 years. The youngest patient was 18 years old and the oldest patient was 86 years old. Among these patients 20 were male and 30 were female. Female: Male ratio is 1: 0.6

RISK FACTORS

Risk factors	Number of patients	%
Immobilization longer than 3 days	20	40.0
Pregnancy and the postpartum period	10	20.0
Major surgery in previous 12 weeks	10	20.0
Previous DVT	2	4.0
Obesity	2	4.0
Trauma	8	16.0
Cancer	6	12.0
Smoking	18	36.0
DM	8	16.0
Hypertension	9	18.0
Use of oral contraceptive pills/hormone replacement therapy	6	12.0
IHD	2	4.0
Stroke/paralysis	2	4.0
Other medical conditions (Sepsis, nephrotic syndrome, burns, fractures, ulcerative colitis, COPD, SLE, TB, Varicose vein)	20	40.0
Prothrombotic conditions	1	2.0

Signs and Symptoms

Symptoms	Number of patients (n=50)	%
Pain		
<7 days	28	56.0
>7 days	22	44.0
Swelling	50	100
Redness/discoloration	20	40.0

Signs	Number of patients	%
Erythema/Discoloration	20	40
Increased local Temperature	22	44
Swelling	50	100
Tenderness	45	90
Positive Homans's sign (calf pain at dorsiflexion of the foot)	18	36

Treatment

All patients were given low molecular weight heparin enoxaparin for seven days by subcutaneous route in twice daily regime. Oral anticoagulant (Warfarin 2-4 mg) was used in all patients and was started on the third day of starting the LMWH.

Outcome of signs of DVT following treatment with low molecular weight heparin.

Signs	Day1 (n=50)	Day7 (n=50)	% Change	P value
Discoloration	20(40.0%)	10(20.0%)	-20.0%	0.021
Increased local Temperature	22(44.0%)	2(4.0%)	-40.0%	<0.001
Swelling	50(100.0%)	20(40.0%)	-60.0%	<0.001
Tenderness	45(90.0%)	24(48.0%)	-42.0%	0.008
Homan's sign	24(48.0%)	4(8.0%)	-40.0%	0.004
Difference in Calf girth in centimeters	3.82±1.99	1.98±1.21	-48.16%	<0.001
Difference in thigh girth in centimeters	1.92±2.97	1.22±1.99	-36.45%	0.004

DISCUSSION

Mean age of the patients in our study was 45.56 +/- 14.65 years. There was female predominance with male to female ratio of 0.6:1. Average BMI was in overweight range. Risk factors studied were Immobilization longer than 3 days ,Pregnancy and the postpartum period ,Major surgery in previous 12 weeks, Previous DVT, Cancer, Obesity ,Trauma ,Smoking ,Diabetes mellitus, Hypertension ,Use of oral contraceptive pills/hormone replacement therapy, Ischemic heart disease, Stroke/paralysis, Other medical conditions (Sepsis, nephritic syndrome, burns, fractures, ulcerative colitis, COPD, SLE, TB, Varicose vein) and Prothrombotic conditions. Immobilization longer than 3 days was present in 40% of the patients. Pregnancy and the postpartum period was present in 20%of the patients.10% of the patients had history of surgery in last 12 weeks. Previous history of DVT was present in 4 % of patients. Cancer accounted for 12% of patients with 3 patients of lung cancer,2 patients of ovarian cancer and 1 patient of Gall Bladder carcinoma.16% patients had history of trauma to involved limb.6% of the patients were on Use of oral contraceptive pills/hormone replacement therapy. 18% were smokers. Diabetes mellitus, Hypertension and Stroke/paralysis was present in 9%,8% and 2% of patients respectively. Other medical conditions (Sepsis, nephrotic syndrome, burns, fractures, compression myelopathy, COPD, SLE, TB, Varicose vein) were present in 28 % of patients. Symptoms of DVT were pain, local swelling and redness/discoloration. Clinical Signs observed were swelling, increased local temperature, discoloration, tenderness, Homan's sign. Statistically significant improvement in the objective clinical signs of deep vein thrombosis after treatment with low molecular weight heparin enoxaparin was seen in discoloration ($p=0.021$), increased local temperature ($p<0.001$), swelling ($p<0.001$), tenderness ($p=0.008$). Homan's sign ($p=0.004$) and calf girth in centimeters ($p<0.001$).Our study findings are similar to other previous studies evaluating clinical profile of patients with DVT and response to low molecular weight heparin like Silverstein et al(3), Heit JA et al(4), Cushman et al(5), Kahn et al(6), Weinmann et al(7) , Gruel et al(8) , Wells et al(9).

CONCLUSION

Major risk factors for deep vein thrombosis are immobilization longer than 3 days, pregnancy and the postpartum period, major surgery in previous 12 weeks, cancer and trauma. Common clinical features of DVT are pain,swelling,tenderness, discoloration and increased local temperature. Low molecular weight heparin enoxaparin is effective in treatment of DVT.

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