ORIGINAL RESEARCH PAPER

Volume-7 | Issue-11 | November-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

STUDY OF CLINICAL PROFILE AND MANAGEMENT OF PATIENTS PRESENTING PRIMARILY WITH DEEP VEIN THROMBOSIS

General Medicine

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ABSTRACT

Aim and Objectives: To study the clinical profile, identify predisposing factors, management and complications in patients presenting primarily with Deep Vein Thrombosis (DVT).

Method: This study was done on 75 cases of Duplex Venous Ultrasound (DVU) proven DVT over a 2-year period. Clinical and ultrasonographic outcome of DVT after 1 week, 2 weeks and 3 months were recorded.

Results: Younger age groups (30-39 years) were affected more commonly (28%). Majority of cases (39) had coexistent involvement of both proximal and distal veins. Swelling and pain of affected extremity were the most common clinical presentation. The majority of patients had no obvious predisposing factors. Around 60% of cases have complete clinical resolution and approximately 50% cases have complete ultrasonographic resolution at the end of 3 months.

Conclusion: The patients in younger age groups and without any obvious risk factors often present primarily with DVT. Hence, we recommend testing and assessment for genetic and acquired causes of thrombosis in these patients. Early initiation and adequate anticoagulation will reduce chronic complications.

KEYWORDS

Predisposing Factors, Deep Vein Thrombosis, Duplex Venous Ultrasound, Ultrasonography, Anticoagulation.

INTRODUCTION

The term thrombosis refers to the formation of an abnormal mass within the vascular system from constituents of blood. When this process occurs within the deep veins, it is referred to as deep vein thrombosis [1]**.** The incidence of DVT in the general population has been estimated to be 80-100 per 1,00,000 annually in the western societies [2] and 4-75 per 1,00,000 in South-Asia [3]**.**

Indian perspective on DVT is lacking due to scanty work in this field. Most of the literature available in India is from the orthopedic departments. Almost all the research has been done on post-operative patients [3,4]**.** There are only a few studies on clinical profile, predisposing factors and management, specifically of idiopathic DVT. Hence, this study had been undertaken with an objective of studying clinical profile, identifying predisposing factors, management and complications in patients presenting primarily with DVT.

MATERIALS AND METHODS

The present observational study was conducted on 75 cases presenting primarily with DVT, confirmed by venous Doppler and admitted to medicine wards in a tertiary care hospital over 2-years period. Ethical clearance was obtained from Institute. Written informed consent was taken from all patients. Patients developing DVT during hospitalization, patients with secondary DVT and those developing DVT due to trauma, were excluded.

A detailed history, physical and systemic examination and relevant investigations were done. Demographic data (age and sex) were recorded. CT pulmonary angiography was done in selected patients with clinical suspicion of pulmonary embolism. In duplex Venous Ultrasound (DVU), patients were examined in a sitting position or in reverse Trendelenburg's position at about 15 or 20° for adequate distention of veins. Common femoral vein, sapheno-femoral junction, superficial and deep femoral veins, popliteal vein, anterior and posterior tibial veins, peroneal veins and muscular veins were evaluated in longitudinal and transverse plane, initially on B-mode and then on color Doppler study. Linear array transducers were used for femoral and popliteal venous segments and for calf veins. Convex transducers were used for evaluation of iliac veins and inferior vena cava. Presence of thrombus, its characteristics and extent were recorded. Compression technique, Valsalva maneuver and augmentation were used to evaluate complete or partial thrombosis, proximal obstruction and patency of distal veins respectively. Re-canalization and collaterals were looked for.

Side and site of involvement were observed. Above knee deep vein thrombosis were recorded as proximal while below knee deep veinthrombosis were recorded as distal. Patients having simultaneous involvement of above and below knee veins were recorded as having both. Predisposing factors for DVT, if any, were recorded. DVU was done on all patients at admission and then repeated after 1 week, 2weeks and 3 months.

As standard treatment of DVT, all patients received anti-coagulation with heparin and warfarin with monitered International Normalised Ratio (INR). Catheter directed thrombolysis (CDT) and inferior vena cava (IVC) filter placement was done in indicated patients [5].

All the patients were followed-up clinically and with DVU after 1 week, 2 weeks and 3 months. Clinical follow-up was recorded as no resolution, partial resolution or complete resolution of signs and symptoms at each visit. Patients were also followed-up for complications.

Statistical analysis

The categorical data was expressed as actual numbers and percentage. Pearson's chi-squaretest was used to compare categorical data. Continuous data was expressed as mean±standard deviation and student't' test was used for comparison. Statistical software STATA version13.1 was used for statistical analysis.

OBSERVATIONS AND RESULTS

Out of 120 cases, 75(62.5%) cases had DVU proven thrombosis. The mean age of cases was 39.52±14.41 years, ranging from 15-74 years with majority of cases in the age group of 30-39years [21(28%)]. Out of 75 cases, there were 40(50.33%) males and 35(46.67%) females with male to female ratio of 1.14:1.

Table 1: Distribution of DVT cases by side and site of involvement as well as clinical presentation of cases

Distribution of cases		Number	Percent
Side of involvement	Left	57	76
	Right	16	21.33
	Bilateral	2	2.67

Site of involvement	Both	39	52
	Proximal	34	45.33
	Distal	2	2.67
Clinical Presentation	Pain	75	100
	Swelling	75	100
	Skin changes	21	28
	Edema	75	100
	Tenderness	75	100
	Homan's sign	37	49.33

Table 2: Predisposing Factors in Cases (N=75)

Predisposing Factor	Number	Percent
Smoking	17	22.67
Hyperhomocysteinemia	11	14.67
Multiple Risk Factors	11	14.67
Hypertension	8	10.67
Pregnancy or Post partum	8	10.67
Prolonged Immobility	5	6.67
Prior Thromboembolism	4	5.33
Malignancy	3	4
Others	2	2.67
Dyslipidemia	1	1.33
CKD	1	1.33
Anti-Phospholipid Antibody	0	0
Oral Contraceptive Pills	0	0
No known predisposing factor	30	40

Mean value of hemoglobin, D-Dimer and serum homocysteine were 10.59±2.52 g/dL, 2.73±0.98 mg/L and 19.00±13.89 µmol/L respectively. ECG [65 (86.67%)] and chest x-ray [69 (92%)] were within normal limits in majority of cases. On ECG, 4(5.33%) cases had left ventricular hypertrophy, 4(5.33%) cases had sinus tachycardia, 1(1.33%) case had left ventricular strain pattern and 1(1.33%) case had right bundle branch block. On chest X-ray, 3(4%) cases had cardiomegaly, 2(2.67%) cases had dilated pulmonary artery and 1(1.33%) case had consolidation.

7 cases were post-partum and 1 case was pregnant. Most were in age group of 20-29 years with a mean age of 27.5±5.12 years. All of them had left-sided DVT. 5 cases had involvement of both proximal and distal veins. 3 cases had involvement of only proximal veins. Most cases had no predisposing factor except 1 case, which had sickle cell disease. Out of 7 post-partum cases, 5 had delivered by lower segment caesarean section and 2 had delivered by normal vaginal delivery.

Table 3: Management of DVT cases

Type of Heparin Received	Number	Percent
Low Molecular Weight Heparin	56	74.67
Unfractionated Heparin	19	25.33
IVC Filter Placement and Catheter Directed Thrombolysis		
Only IVC filter placement	5	6.67
Catheter Directed Thrombolysis with IVC Filter Placement	4	5.33
No Intervention	66	88

Table 4: Clinical and Doppler Venous Ultrasound (DVU) Follow Up of Cases

Clinical follow-up	1 Week	2 Weeks	3 Weeks
No resolution	11(14.67%)	0(0.00%)	0(0.00%)
Partial resolution	63(84%)	64(85.33%)	17(22.67%)
Complete resolution	1(1.33%)	11(14.67%)	48(64%)
Lost to Follow Up	0(0.00%)	0(0.00%)	10(13.33%)
DVU Follow-up	**1 Week**	**2 Weeks**	**3 Weeks**
No change	26(34.67%)	3(4.00%)	0(0.00%)
Improved	47(62.67%)	67(89.33%)	14(18.66%)
Resolution	2(2.67%)	5(6.67%)	36(48.00%)
Chronic	0(0.00%)	0(0.00%)	15(20.00%)
Lost to follow up	0(0.00%)	0(0.00%)	10(13.33%)

3(4%) cases developed pulmonary embolism. 2(2.67%) cases had DVT recurrence. 6(8%) cases had post-thrombotic syndrome. 2(2.67%) cases developed coagulopathy.

DISCUSSION

Of 120 cases, 75(62.5%) cases had DVU proven thrombosis, which correlated with previous studies [6]. Younger age groups (30-39 years) were more commonly (28%) affected without gender predilection. Left lower limb was more commonly affected by DVT than right. Involvement of both proximal and distal veins was most common followed by only proximal and only distal veins. These findings correlated with previous studies [7-9]. Involvement of only distal veins and DVT is often asymptomatic and do not come to clinical attention. This might be the reason behind only few cases with restricted calf DVT.

Majority of patients of DVT presented with pain and swelling of affected extremity which are not specific for diagnosis of DVT. These findings correlated with previous works [7-9]. The majority of patients didn't have any obvious predisposing factors, where, hereditary thrombophilia might be responsible. However, this could not be tested due to lack of facility and cost restrictions and was a lacunae in our study. D-Dimer is a marker of endogenous fibrinolysis. Cases with both proximal and distal involvement had higher D-Dimer values as compared to those with only proximal DVT, (p value < 0.0001). This is expected because more extensive DVT will have more fibrinolytic response. The result was similar to study done by Ceriotti C et al [10]. 11 cases had raised serum homocysteine (≥30 µmol/L) levels, which is a well known predisposing factor for thrombosis and is in accordance with previous study by Falcon CR et al [11]. Pregnant and post-partum cases were younger and DVT more commonly during post-partum period. Also, left-sided predominance was observed and majority of subjects had caesarean section, which was in accordance with previous studies [12-14].

All cases received anticoagulation with heparin and warfarin with monitered INR. CDT with prior IVC filter placement was done in 4(5.33%) cases as indicated [5]. 5(6.67%) cases underwent only IVC filter placement. Cases that underwent CDT had faster resolution, clinically as well as on DVU. This was similar to findings in previous studies [15,16].

At the end of first week, clinically, 11(14.67%) cases had no resolution of signs and symptoms, 63(84%) cases had partial resolution and 1(1.33%) case had complete resolution. On ultrasound, 47(62.67%) cases showed improvement, 26(34.67%) cases showed no changes. 2(2.67%) cases showed resolution.

By second week, clinically, 64(85.33%) cases had partial resolution, 11(14.67%) cases had complete resolution. On ultrasound, 67(89.33%) cases showed improvement, 3(4%) cases showed no change while 5(6.67%) cases showed resolution.

At the end of 3 months follow-up, 48(64%) cases had complete clinical resolution while 17(22.67%) cases had persistent swelling, pain, tenderness or skin changes. On ultrasound, 36(48%) cases showed resolution, 14(18.67%) cases showed improvement. 15(20%) cases showed chronic changes. All these findings correlated with previous studies [9,17,18].

After 3 months of follow-up, we compared cases of both proximal and distal DVT with cases of only proximal DVT with respect to various demographic factors, clinical parameters, laboratory investigations and progress of DVT. There was no significant difference observed between two groups in terms of age group, gender distribution, predisposing factors, clinical presentation and laboratory investigations than cases with only proximal DVT. There was no difference in clinical resolution between the two categories after 3 months. Whereas, on DVU, more cases with only proximal DVT had resolution. Chronic changes were more frequent in cases with both proximal and distal DVT. But these differences were statistically not significant.

CONCLUSION

Duplex venous ultrasound is reliable non-invasive diagnostic modality for diagnosis of DVT in clinically suspected cases. Our study demonstrated that patients in younger age groups and without any obvious risk factors often present primarily with DVT. Majority patients didn't have any obvious predisposing factors. Hence, we recommend testing and assessment for genetic and acquired causes of thrombosis in these patients. Early initiation and adequate anticoagulation will reduce chronic complications. With only few Indian studies on primary DVT, in the absence of obvious predisposing factors, there is a large scope of research and further studies.

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