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Original Article

Profile of Deep Venous Thrombosis at a Tertiary Care Hospital in Kashmir

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Abstract

Background: Deep vein thrombosis (DVT) is a complex disease, involving interactions between acquired or inherited predispositions to thrombosis and various risk factors.

Aims and Objectives: Profile of patients diagnosed with DVT was analyzed with respect to their demographic and lab parameters.

Materials and Methods: A prospective cross-sectional analysis carried out on patients of DVT, in the Department of Internal Medicine, GMC Srinagar.

Results: Genetic factors, post-surgical state, and malignancy were the major risk factors for DVT.

Conclusion: Our analysis was corroborating with world literature as regard to the various risk factors associated with DVT.

Key words: Deep vein thrombosis, Hypercoaguable, Kashmir, Provoked, Unprovoked

INTRODUCTION

Deep vein thrombosis (DVT) is the formation of a blood clot in the deep venous system of the body usually seen in the lower extremities. Although DVT of the upper limb vein is also seen and is relatively less frequent, accounting for only 5–10% of all DVTs.[1,2] DVT of the lower limb presents with pain and swelling of the lower limb and is a big morbidity to the patient. Nearly one-third of all the lower limb DVT may dislodge and embolize to the pulmonary arteries and can lead to fatal complication.[3] As regard to the etiopathogenesis, DVT may be provoked or unprovoked. In an unprovoked DVT, there is as such no apparent triggering factor which may lead to thrombus formation. Hence, in anunprovoked DVT, a detailed thrombophilic profile of the patient is warranted. Moreover, unprovoked DVT may be genetically determined, acquired, or both.[1-3] The most common cause of hereditary thrombosis is "factor five leiden mutation," prothrombin gene mutation and "methyl tetrahydrofolate reductase" (MTHFR) gene mutation.[4] Other hypercoagulable states are Protein C (PC), Protein S (PS), Antithrombin III deficiency and antiphospholipid antibody (APLA) syndrome.[5-7]

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MATERIALS AND METHODS

This study was conducted in the Department of Internal Medicine, Government Medical College Srinagar, from October 2017 to October 2018. It was a prospective, non randomized cross-sectional study, carried out on 52 patients aged 26–60 years with a clinical diagnoses of DVT. A detailed history in cases of "provoked DVT" was taken and a thorough examination was done. A minimum of 5 ml of blood was taken and sent for detailed thrombophilic profile [Table 1] before starting anticoagulation in all patients.

RESULTS

The demographic data and laboratory parameters were analyzed by SPSS Version 20. Qualitative variables

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were expressed as a percentage and quantitative ones as mean ± SD.

"FV Leiden mutation" in the unprovoked group followed by post-surgical status and underlying malignancy in the provoked group were the most common associated factors in patients of diagnosed DVT.

Baseline patient data were collected along with patterns of clinical presentation for further analysis [Tables 2 and 3].

Among 52 patients, 17 were having provoked DVT of which 7 patients were having DVT secondary to post-surgical intervention, and 5 were having underlying malignancy, and 2 were taking oral contraceptive pills, and 1 patient was having major depressive disorder with DVT secondary to prolonged homestay. Two patients were post stroke DVT [Table 4 and Figures 1-3].

Of the total 52 patients of DVT, 32 were females and 20 males [Table 1].

Table 1: Baseline parameters of DVT

Type of DVT	Number of cases	Percentage of total
Provoked	17	32.6
Unprovoked	35	67.4
Gender		
Males	20	38.4
Females	32	61.6
Total	52	100

DVT: Deep vein thrombosis

Table 2: Baseline patient profile

Patient characteristics	Mean±SD
Age	38.6±5.3
Hb	11±2.8
HCT	43±2.3
TLC	4.5±1.2
PLT	160±80
Urea	15±6.7
Creatinine	0.7±0.21
AST	30.2±7.2
ALT	31±8.6
ALP	89±22.3
ALB	3.9±0.4

DVT: Deep vein thrombosis, Hb: Hemoglobin, HCT: Hematocrit, TLC: Thin-layer chromatography, ALP: Alkaline phosphatase, ALT: Alanine aminotransferase, AST: Aspartate aminotransferase, ALB: Albumin

Table 3: Clinical presentation

Presentation	Number of patients
DVT lower limb	39
DVT upper limb	2
Cortical vein thrombosis	5
Pulmonary thromboembolism	6

DVT: Deep vein thrombosis

Among the 35 unprovoked cases of DVT, 9 patients were having "FV Leiden mutation," 7 patients having Antithrombin III deficiency. Five patients were APLA positive. Four patients were having PC and PS deficiency, 2 patients were having "MTHFR" gene mutation, 2 patients with prothrombin gene mutation, 1 patient with hyperhomocysteinemia, and 1 patient had increased factor VIII levels [Table 5 and Figure 2].

DISCUSSION

DVT is a significant cause of patient mortality, morbidity, and economic burden.[8] As per a global epidemiologic analysis on thromboembolic conditions, DVT/PTE is estimated to account for 1 in 4 deaths worldwide and is a leading cause of mortality.[9] Venous thrombosis comprising DVT and pulmonary thromboembolism have been seen to occur for the 1st time in ~ 100 persons per 100,000 each year in the United States. Rates increase sharply after 45 years and are slightly more in males than women in elderly age.[10]

An Indian retrospective data analysis conducted on over 500 patients, depicted an acute DVT without PE to be the predominant presentation (64%), while as DVT with PE, and PE alone were reported in 23% and 13% patients, respectively,[11] as regard to underlying etiopathology, DVT has been divided into provoked or unprovoked DVT depending on the presence or absence of any underlying triggering factor. Worldwide, nearly half of the DVTs are unprovoked while the rest have an underlying medical or surgical comorbidity.[12]

Worldwide "FV Leiden" mutation is supposedly the most frequent genetic abnormality leading to prothrombotic state. The prevalence rate of this mutation varies according to the ethnic and geographic distribution of the populations.[13]

The incidence and prevalence of venous thromboembolism are considered to be lowest in Asians.[14] In India, the prevalence of FV Leiden mutation was 3.8 %, as per a screening analysis conducted in North India on healthy asymptomatic subjects.[15] Our analysis depicted "FV Leiden mutation" to be the most common cause of unprovoked DVT with around 25% of patients having such mutation.

Other mutations in our analysis were "antithrombin III," "PC and S deficiency," and "APLA" positivity, collectively accounting for nearly one-third of all patients. In a meta-analyses the worldwide prevalence of PS, PC deficiency, and anti-thrombin C is seen to vary from 4% to 11% collectively.[16]

Table 4: Profile of provoked DVT

S. No	Type of provocation	Number of cases	Percentage of provoked	Percentage of total
1.	Post-surgical intervention	7	41.3	13.5
2.	Underlying malignancy	5	29.4	9.6
3.	OCP intake	2	11.7	3.8
4.	Post-stroke bed ridden	2	11.7	3.8
5.	Prolonged immobilization (secondary to major depression)	1	5.8	1.9

DVT: Deep vein thrombosis, OCP: Oral contraceptive pill

Table 5: Thrombocheck profile of "unprovoked DVT"

S. No	Thrombocheck profile	Number of cases	Percentage of unprovoked	Percentage of total
1.	Factor V Leiden mutation	9	25.7	17.3
2.	Antithrombin III deficiency	7	20	13.4
3.	APLA positive	5	14.2	9.6
4.	PC deficiency	4	11.4	7.7
5.	PS deficiency	3	8.5	5.7
6.	Prothrombin gene mutation	3	8.5	5.7
7.	MTHFR gene mutation	2	5.7	3.8
8.	Hyperhomocysteinemia	1	2.8	1.9
9.	Increased Factor VIII levels	1	2.8	1.9

PC: Protein C, PS: Protein S, ALPA: Antiphospholipid antibody, MTHFR: Methyl tetrahydrofolate reductase, DVT: Deep vein thrombosis

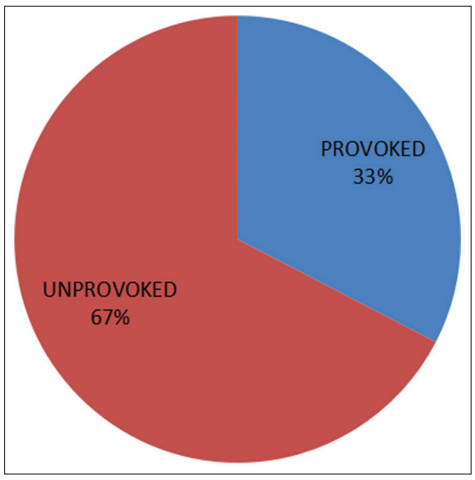

Figure 1: Pictorial representation of the percentage of deep vein thrombosis

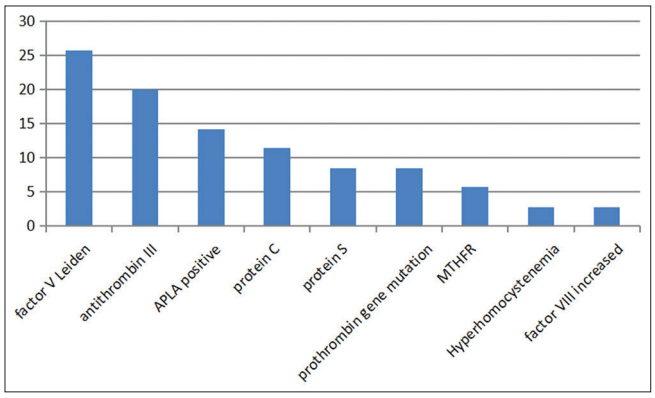

Figure 2: Graphic representation of unprovoked deep vein thrombosis

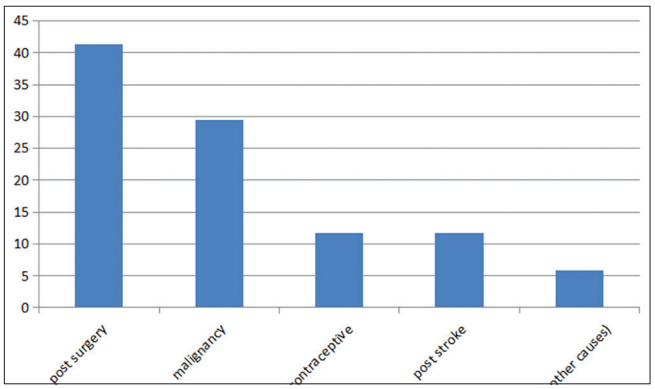

Figure 3: Graphic representation of provoked causes of deep vein thrombosis

In a South Asian study, overall PC and PS deficiency was detected in 8.7% patients of unprovoked thrombophilia.[17]

Provoked causes of DVT mainly involve the history of surgery, underlying malignancy or intake of contraceptive pills while as prolonged immobilization is one of the causes of venous thrombosis.[18]

Western literature depicts the prevalence of post-operative DVT to range from 15% to as high as 40%.[19] Although there have been less studies on post-operative DVT in Asian patients, the incidence varies from 1.5% in spinal surgeries to over 40% in colorectal surgeries.[20]

In a randomized Indian analysis conducted on over 160 post-operative patients, half were put on low molecular weight heparin prophylaxis while as the rest were on

placebo. Two patients in the placebo group developed DVT (2.4%) while as none in the prophylaxis group developed DVT.[18]

Our study revealed the equal prevalence of post-operative and malignancy associated DVT accounting for 7.6% each.

Although the pathophysiological mechanisms underlying DVT in cancer patients remain poorly understood, malignancy is shown to increase the risk of DVT by around 2–4 times. Post-operative DVT is a well-studied complication of major oncological surgeries;[21] moreover, the presence of malignancy in a surgical candidate increases the risk of DVT by around 10–40% without prophylaxis.[22]

In our analysis post-operative risk and malignancy together contributed to around 23% of the total patients developing DVT.

Prolonged immobilization, post-stroke state in the provoked group while as MHTFR gene mutation and hyperhomocysteinemia in the unprovoked group accounted for nearly 6% each of the total cases of DVT.

CONCLUSION

Although the clinicodemographic parameters of DVT vary widely across various nations of the world, the incidence of DVT irrespective of the incriminating factors is more prevalent in the western nations. In the Asian subcontinent, the data on DVT are evolving rapidly. Indian data unanimously suggest genetic factors coupled with major surgeries and underlying malignancy to be the major determinants of DVT.

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