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Original Research Article

Causative factors of deep vein thrombosis of lower limb in Indian population

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ABSTRACT

Background: Deep vein thrombosis refers to the formation of an abnormal coagulum within the deep venous system. An accurate diagnosis of DVT is extremely important to prevent potentially fatal acute complications of pulmonary embolism (PE) and long-term complications of post phlebitis syndrome and pulmonary hypertension. There are many causative factors for DVT.
Methods: This was a prospective study where 50 cases of DVT were admitted in this centre. Patients were evaluated in terms of causative factors of DVT. These were previous history of DVT, immobility, surgery, smoking, obesity and drugs. Age and gender comparisons were also done. The most common causes were recorded.
Results: The most common cause was found to be immobility and post-surgery immobilization which constituted 90 % of the patients in the study. Advanced age and male gender showed a higher incidence of DVT.
Conclusions: Early identification of the causes and the risk factors in the development of DVT can reduce the burden of the disease and contribute to its prevention and management.

Keywords: Deep venous thrombosis, Immobility, Thrombus

INTRODUCTION

The term thrombosis refers to the formation of an abnormal coagulum within the vascular system. When this process occurs within the deep veins, it is referred to as deep vein thrombosis (DVT). An accurate diagnosis of DVT is extremely important to prevent potentially fatal acute complications of pulmonary embolism (PE) and long-term complications of post phlebitis syndrome and pulmonary hypertension.[1]

Deep-vein thrombosis (DVT) has an estimated annual incidence of 67 per 100 000 among the general population.[2]

Deep venous thrombosis is one of the leading causes of loss of 'disability-adjusted life years' (DALYs) in developing countries and the second leading cause in developed countries with premature death as the main contributor. Public awareness of thrombosis is low, and fewer people have basic knowledge of its symptoms and risk factors compared to other diseases.[3]

The aim of the study was to find the causative factors of Deep Vein Thrombosis of lower limb in Indian population. Early identification of the causes and the risk factors in the development of DVT can reduce the burden of the disease and contribute to its prevention and management.

METHODS

Type of study was prospective study. Place of study was Dr. D Y Patil medical college and hospital and research

center, Pimpri, Pune-18, Maharashtra, India. Plan of study was all the patients who presented to surgical OPD with DVT were admitted and evaluated. Period of study was from October 2016 to September 2017. Sample size involved 50 cases. Informed and written consents were taken from all patients. Immunocompromised patients were excluded from the study.

Detailed history, clinical examination and routine hematological examinations were carried out in all cases. Patients were evaluated in terms of causative factors of DVT. These were inherited or acquired thrombophlebitis, previous history of DVT, immobility, previous major surgery, history of smoking, obesity and drugs. Genetic factors were considered. Age and gender comparisons were also done. Lower limb venous Doppler was also done in all cases. Patients were managed conservatively.

RESULTS

Patients were evaluated on the basis of the causative factors for DVT listed below.

Table 1: Medical causative factors of DVT.

Medical
Age
Major surgery
Trauma
Prolonged bed rest

Table 2: Drugs as causative factors of DVT.

Drugs
Oral contraceptives
Postmenopausal hormones
In vitro fertilization
Chemotherapy
Thalidomide
Corticosteroids

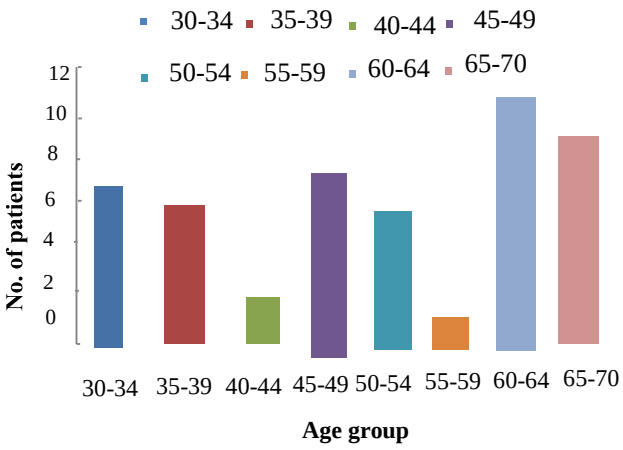

Figure 1: Age distribution of patients with DVT.

Age distribution

The most common age group that was affected was between 60 to 64 years (Figure 1).

Table 3: The various behavioural factors for DVT.

Behavioural
Obesity
Smoking
Lack of exercise

Table 4: Various genetic factors for DVT.

Genetic factors
Non-0 blood group
Antithrombin deficiency
Protein C deficiency
Protein S deficiency
Factor V Leiden
Prothrombin 20210A
fibrinogen 10034 T
factor XIII val34leu

Past history

Previous history of surgery, bedridden status, drugs and recurrence were taken into account. In this study the most significant past history was history of the patients being bedridden (Figure 2).

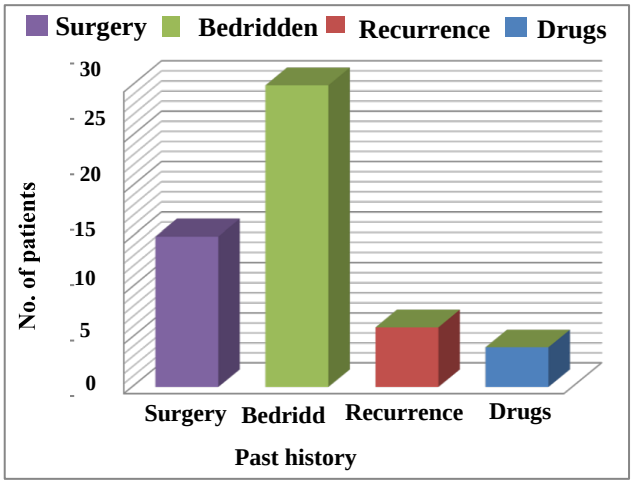

Figure 2: Evaluation of past history.

In this study, majority of patients were males (39 patients in a 50 patients sample size).

We observed that swelling, pain, fever and affected limb discoloration were the most common presenting features. Their presence correlated with the diagnosis of Deep Vein Thrombosis. 50% of the patients presented with more than two symptoms (Figure 3).

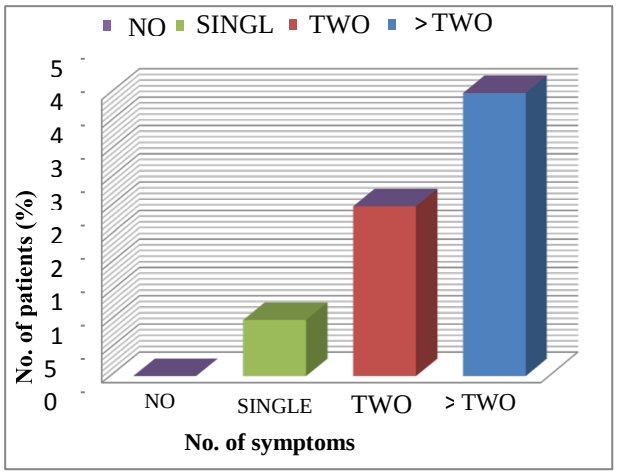

Figure 3: Association of various clinical symptoms with DVT.

Table 5: Evaluation of acquired medical risk factors.

Acquired medical risk factors	No. of cases	No. of cases (%)
Surgery	15	30
Immobilization	30	60
Drugs	2	4
Recurrent DVT	3	6
Trauma	Nil	Nil

History of drug intake was seen in two patients. One female patient had a history of oral contraceptive drug intake and another female patient was on postmenopausal hormone therapy. None of the patients had a history of Thalidomide or corticosteroid intake (Table 6).

Table 6: Evaluation of history of drug intake.

Drugs (4% in this study)	Number of cases
Oral contraceptives	1
Postmenopausal hormones	1
In vitro fertilization	Nil
Chemotherapy	Nil
Thalidomide	Nil
Corticosteroids	Nil

Obesity as a causative factor was seen in 46% patients. History of smoking and lack of exercise were seen in 44% and 50% patients respectively.

Genetic risk factors were nil in this study.

Table 7: Evaluation of behavioural risk factors.

Behavioural	No. of cases	Cases (%)
Obesity	23	46
Smoking	22	44
Lack of exercise	25	50

Figure 4: DVT with primary presentation of chronic non-healing ulcer.

Figure 5: Edema of calf caused due to DVT.

DISCUSSION

DVT is a major and a common preventable cause of death worldwide.[2] The incidence of DVT is high in elderly people. In this study, as well as in a study by Quriel K et al, people more than 60 years of age were mainly affected. Old age is associated with other co-morbidities such as immobilization, malignant conditions which increase the risk. The incidence rises markedly in persons of 60 years and above and may be as high as 900 cases per 100,000 by the age of 85 years.[4]

According to Parasuraman S, the incidence of DVT is low in children. This low incidence may be due to decreased capacity to generate thrombin, increased capacity of alpha-2-macroglobulin to inhibit thrombin, and enhanced antithrombin potential of vessel walls.[5]

The above findings were comparable with this study.

According to studies both sexes were equally afflicted by a first episode of DVT, men having a higher risk of recurrent thrombosis.[6,7]

In this study females were affected less than males. In the following table the number of female patients are compared with the number of female patients in a study which also showed a lower female preponderance (Table 8).[2]

Table 8: Comparison of female patients in study.

Series	Total no. of patients	No. of female patients
Silverstein et al[2]	100000	130
This Study	50	11

Probable causes for low female population were:

- Small sample size.
- Male preponderance in population.

While the incidence of pulmonary embolism has decreased over time, the incidence of deep vein thrombosis remains unchanged for men and is increasing for older women.

Lower extremity DVT can be symptomatic or asymptomatic. Symptomatic patients with proximal DVT may present with lower extremity pain, calf tenderness, and lower extremity swelling.[8,9] In this study swelling, pain, fever and affected limb discoloration were the most common presenting features. 50% of the patients presented with more than two symptoms.

In this study most, common risk factor was history of immobilization. In a study, development of DVT post-surgery was the most common risk factor.[10]

The reasons for this are:

- Immobilization with associated co-morbidities like increasing age, smoking and obesity.
- Lack of screening for malignancies in this setup.

In this study history of surgery was present in 30% patients. In a study, of all medical conditions, cancer was the strongest risk factor, increasing the risk of thrombosis over 50-fold in the first six months after diagnosis.[11]

Oral contraceptive pills, especially those that contain third-generation progestins and postmenopausal replacement therapy increase the risk of DVT. Combined oral contraceptives, containing an oestrogen and a progestin increase the risk of venous thrombosis 2- to 4-fold.[12]

In this study, one female patient had a history of oral contraceptive drug intake.

In a study, the risk of recurrence was almost five times as great among men as among women. Five years after the withdrawal of oral anticoagulation, the likelihood of recurrent venous thrombosis was 30.7 percent among men and only 8.5 percent among women (with an upper 95 percent confidence bound of 12.0 percent).[13]

In this study, recurrence of DVT was seen in 6% of patients. All these patients were males. Hence this study was comparable with the above study.

The risk of recurrent venous thrombosis is greatly increased among patients who have had more than one thromboembolic episode.[14]

The most prominent genetic risk factors for venous thrombosis are deficiencies of the natural anticoagulants protein C, protein S and antithrombin.[15] Because they are so rare they are not important on a population level, and screening for them is not cost-effective, nor has a positive risk-benefit ratio been proven. While traditionally these were seen as the strongest risk factors for thrombosis, recently some doubt has been shed on that idea.[16,17]

In this study, none of the patients had these genetic causative factors. Hence, these causes and risk factors need to be evaluated for prevention of DVT.

In this study DVT was diagnosed on the basis of history, clinical examination, haematological investigations, D dimer study and lower limb venous Doppler study. Patients were managed conservatively.

CONCLUSION

In this study we found that there are multiple causative factors of Deep Vein Thrombosis such as immobility, surgery, obesity, smoking, previous history of DVT, increase in age and male gender.

The most common cause was found to be immobility and post-surgery immobilization which constituted 90% of the patients in the study. Timely identification of the causes and risk factors of DVT can prevent the development of DVT and management of these factors can reduce the burden of DVT.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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