Int. J Med. Pharm. Res. (P-ISSN: 2958-3675 | E-ISSN: 2958-3683)
Available on: https://ijmpr.in/

International Journal
of Medical and Pharmaceutical Research

ORGINAL ARTICLE **OPEN ACCESS**

DEEP VEIN THROMBOSIS: A SINGLE CENTRE EXPERIENCE

Dr. Aastha Arora[1], Dr.Muralikrishna N[2], Dr. Shashanka R[3]

[1]Post Graduate Resident, Department of General Surgery, Hassan Institute of Medical Sciences, Hassan
[2]Professor and Head of Department of Vascular surgery, Sri Jayadeva Institute of Cardiovascular sciences and research, Bangalore
[3]Associate professor, Department of General Surgery, Hassan Institute of Medical Sciences, Hassan

OPEN ACCESS

***Corresponding Author**
Dr. Aastha Arora
Post Graduate Resident, Department of General Surgery , Hassan Institute of Medical Sciences, Hassan, India

Received: 12-11-2024
Accepted: 21-12-2024
Available online: 26-12-2024

A B S T R A C T

Background: Venous thromboembolism is a significant healthcare problem, with an estimated 900,000 cases of VT and Pulmonary Embolism, causing 300,00 deaths yearly.[1]VTE is one of the most common vascular diseases associated with high morbidity rate,which is an acute event complicating 2–3/1000 hospital admissions followed by principal diagnosis.[2]

Aims and objectives:

- To assess the epidemiology, aetiology and treatment options for DVT.
- To assess the incidence of anaemia in patients with DVT.

Methodology:All patients admitted in the vascular surgery wards of SJICSR with the diagnosis of deep vein thrombosis from July 2023 to June 2024, were retrospectively analysed in terms of age, sex, risk factor, association with anaemia, laboratory factors, site affected, complications and the mode of treatment–medical/thrombolysis/IVC filter.

Results:Mean age – 45.59 years, with minimum was 17 and the maximum was 84 years. Male preponderance noted. 53.7% of the cases underlying risk factor could not be identified, 11.9% patients suffered from trauma.
45.5% patients found to have anaemia. Lower limb affected more commonly than upper limb.8.2% presented with pulmonary embolism, other cases were uncomplicated. 85.8% of the cases could be managed conservatively.

Conclusions: VTE is a disease of the middle age, equally distributed among male and female, lower limb affected more and conservative management remains the mainstay of treatment, commonly associated with anaemia.IVC filters – retrievable, remained the main treatment modality in those who have developed DVT following trauma, or have a scheduled surgery in the near future.

Keywords:DVT,thromboembolism, Retrospective, analysis, epidemiology, anaemia, aetiology.

INTRODUCTION

Deep vein thrombosis is a solid coagulum in the deep veins. Venous thromboembolism is a significant healthcare problem, with an estimated 900,000 cases of VT and PE, causing 300,00 deaths yearly.[1]VTE is one of the most common vascular diseases associated with high morbidity rate, which is an acute event complicating 2–3/1000hospital admissions followed by principal diagnosis.[2] It is a multifactorial disease with both environmental and genetic risk factors. This paper reviews the epidemiology, aetiology and treatment options for Deep vein thrombosis.

AIMS AND OBJECTIVES

- To assess the epidemiology, aetiology and treatment options for DVT.
- To assess the incidence of anaemia in patients with DVT.

INCLUSION CRITERIA: All patients admitted in the vascular surgery wards of SJICSR, Bangalore with the diagnosis of deep vein thrombosis.

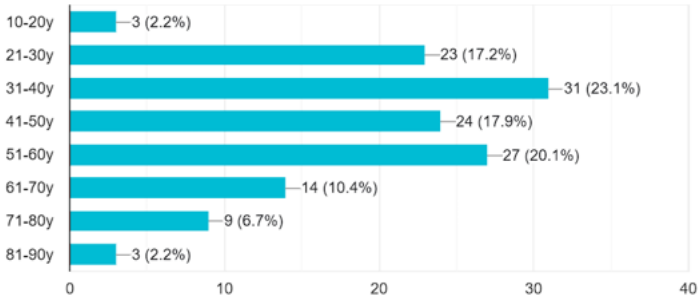
MATERIALS AND METHODS

- Study design : Retrospective study
- Study period : July 2023 to June 2024
- Data collected : age, sex, risk factor, association with anaemia, laboratory factors, site affected, complications and the mode of treatment –medical/thrombolysis/IVC filter.

RESULTS

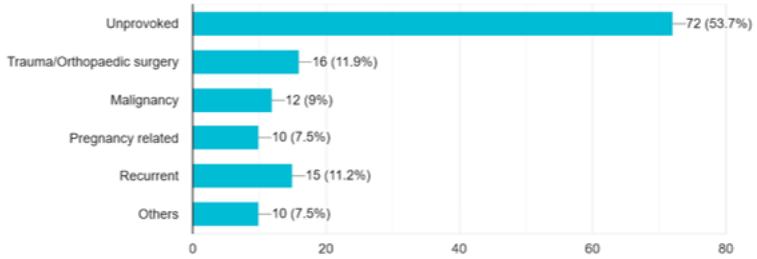
Out of the total 134 patients enrolled in the study, the mean age was 45.59 years in the study population, the minimum was 17 and the maximum was 84 years.69(51.5%) were male and 65(48.5%) were female in our study group.

Fig 1 : Age distribution



In 53.7% of the cases underlying risk factor could not be identified, 11.9% patients suffered from trauma or a recent orthopaedic surgery, which remains as the most frequent identified risk factor followed by previous history of DVT.

Fig 2 : Aetiology of DVT



Lower limb was affected in 128 (95.5%) which was almost 20 times more common than upper limb. INR values were normal in 84.3% of patients. 91.8% cases were treated uneventfully, however 11 patients, (8.2%) presented with pulmonaryembolism. Conservative management remains the mainstay of treatment with compression, limb elevation, LMWH and anticoagulants with timely follow up. 61 patients out of 134 were found to have anaemia.

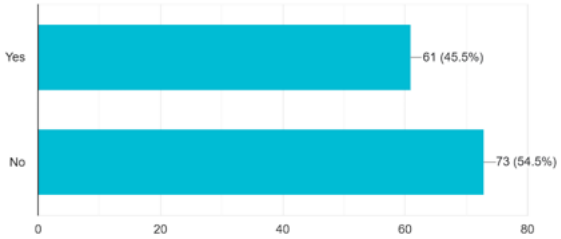


Fig 3 : Association of DVT with Anaemia

DISCUSSION

Deep vein thrombosis is a common and complex condition, significantly contributing to illness and death. It often results from a combination of acquired factors, such as hip fractures, pregnancy, or prolonged immobility, and genetic predispositions like thrombophilias. While the exact mechanisms remain unclear, recent studies have highlighted the roles of venous flow, endothelium, platelets, leukocytes, and the interplay between inflammation and blood clotting. Changes in venous blood flow can activate the endothelium, encouraging platelets and leukocytes to adhere. Through mechanisms such as tissue factor expression and the formation of neutrophil extracellular traps, this process triggers coagulation and traps additional cells like red blood cells. Collectively, these interactions contribute to the development and expansion of clots.

In a study by Khan et al.,[3] the mean age was 48.59 ± 17.01 years in the study population, the minimum was 22 and the maximum was 78 years. Khalafallah, et al.,[4] had almost equal proportions of gender in their study population with 50.5% male and 49.5% female. In 53.7% of the cases underlying risk factor could not be identified, 11.9% patients suffered from trauma or a recent orthopaedic surgery, which remains as the most frequent identified risk factor followed by recurrent DVT. DVT more commonly affects lower limb.

Whether anaemia is the cause or is a result of comorbidities that often pose a risk to development of DVT like malignancy, pregnancy, etc.

Study by Hung et al., [5] revealed similar association of DVT with IDA and the possible explanation lies in anaemia being the cause of DVT. The proposed mechanisms include :

- Some researchers stated that an iron deficiency status is considered a risk factor for thrombocytosis.
- Increase in plasminogen activator inhibitor-1 in anaemia may cause decreased fibrinolytic activity in IDA.
- Increased sheer force caused by anaemia-induced hyperdynamic state can result in endothelial injuries and subsequent thrombus formation.

Early detection allows prompt treatment, preventing serious complications like pulmonary embolism (PE), a life-threatening condition where a clot travels to the lungs. Treating DVT before it progresses to PE significantly reduces mortality rates. Delayed treatment can lead to post-thrombotic syndrome (PTS), characterized by chronic pain, swelling, and skin ulcers. Identifying DVT early helps avoid these long-term issues, improving quality of life. Timely diagnosis enables healthcare providers to use anticoagulants or other therapies to dissolve or prevent clots, reducing the risk of clot recurrence and associated complications.

Detecting DVT in at-risk patients (e.g., those with immobility, recent surgery, or genetic predispositions) helps implement preventive measures like compression stockings or prophylactic medications, reducing future incidences. Diagnostic procedures initiated immediately with the clinical suspicion of DVT are essential to confirm or exclude thrombosis and to lower the risk of complications in the acute phase and in the long term. Early initiation of anticoagulant therapy interrupts appositional thrombus growth, facilitates subsequent recanalization and reduces the risk of embolization. On the other hand, a falsely diagnosed thrombosis leads to unnecessary treatment with the associated (bleeding) risks. Since clinical symptoms and signs are unspecific and therefore uncertain, a validated diagnostic procedure is required. In recent years, diagnostic algorithms have been established for the diagnosis of DVT, which takes into account clinical pre-test probability, the results of D-dimer testing and diagnostic imaging.

According to the revised AWMF S2k guideline on “Diagnostics and Therapy of Venous Thrombosis and Pulmonary Embolism,” [6] venous duplex ultrasonography (VDUS) is considered the method of first choice for the detection of DVT and should therefore – if timely available – primarily be used in cases of suspected DVT.

Once a diagnosis of deep vein thrombosis (DVT) is confirmed, it is crucial to begin anticoagulation therapy immediately at the appropriate dosage.

Treatment is divided into two phases: initial and maintenance therapy. This distinction arises from the differing approvals and uses of specific anticoagulants. The initial phase, lasting 5 to 21 days, involves parenteral anticoagulants or higher doses of oral anticoagulants to address the elevated risk of complications during the acute stage of venous thromboembolism (VTE). Following this, maintenance therapy involves therapeutic dosing for a duration of 3 to 6 months and can be extended for patients with a significant thrombus burden. The anticoagulant chosen for maintenance therapy also dictates the type, strength, and duration of treatment during the initial phase.[6]

At the end of the maintenance period, a critical decision must be made—whether to continue anticoagulation and, if so, at what dosage, or to discontinue it. This decision aims to effectively prevent the recurrence of VTE while balancing the risks and benefits of ongoing treatment.If maintenance therapy involves apixaban or rivaroxaban, anticoagulation can begin directly with oral administration, using higher doses during the initial phase. However, when dabigatran, edoxaban, or vitamin K antagonists (VKAs) are chosen for maintenance, initial treatment with parenteral anticoagulants, such as low-molecular-weight heparin (LMWH) or fondaparinux, is necessary.

Unfractionated heparin (UFH) is now primarily reserved for specific scenarios, such as severe renal failure, where LMWH, fondaparinux, and most oral anticoagulants are not suitable. Additionally, UFH is used in situations requiring a short-acting anticoagulant, such as in patients who are hemodynamically unstable or have a high risk of bleeding.Phlegmasia cerulea dolens is an exceptionally rare vascular emergency caused by extensive thrombosis that fully blocks venous outflow in a leg, potentially leading to complications like compartment syndrome, acute limb ischemia, and venous gangrene. Immediate venous recanalization is vital to save the limb. The choice between endovascular and open surgical recanalization depends on the patient's clinical condition and the expertise available, requiring an interdisciplinary approach.

Endovascular recanalization may also be an option for patients with acute proximal DVT, particularly involving the iliac veins, who are at high risk of developing post-thrombotic syndrome (PTS). It is most effective in cases of descending iliofemoral DVT with significant venous stasis symptoms, provided the symptoms have lasted no more than 14 days and there is a low risk of bleeding.

Recent guidelines recommend a minimum anticoagulation duration of 3 months for patients with lower extremity deep vein thrombosis (LEDVT) and pulmonary embolism (PE). [6] Typically, after 3 to 6 months, these conditions are considered adequately treated, marking the completion of the initial and maintenance therapy phases. However, extensive venous thromboembolism (VTE) may require extended treatment of up to 12 months, particularly if there is a significant residual thrombus burden. Decisions regarding the continuation of anticoagulant therapy beyond the maintenance phase depend primarily on the assessed risk of VTE recurrence. If indefinite therapy is considered, factors such as the patient's bleeding risk, personal preferences, and concerns must be carefully evaluated. Inferior vena cava (IVC) filters have been utilized for decades, yet their effectiveness in managing venous thromboembolism (VTE) remains a subject of debate, largely due to the absence of strong evidence from randomized trials. The primary, widely accepted use of IVC filters is for patients who cannot take anticoagulants during an acute VTE event. [7] However, other possible applications should be carefully assessed on an individual basis by skilled clinicians, taking into account the specific circumstances of each case.

CONCLUSION

Venous thromboembolism is a disease of the middle age, equally distributed among male and female, lower limb affected more and conservative management remains the mainstay of treatment, commonly associated with anaemia.IVC filters – retrievable, remained the main treatment modality in those who have developed DVT following trauma, or have a scheduled surgery in the near future.

REFERENCES

1. Rutherford's Vascular Surgery and Endovascular Therapy – 10th edition
2. Khan MA, Pasha MM, Arjun MN, Subramanian N. Clinical profile, risk factors, and clinical outcomes in patients of venous thromboembolism at a tertiary care center. Ann Afr Med. 2023 Oct-Dec;22(4):415-419. doi: 10.4103/aam.aam_123_22. PMID: 38358139; PMCID: PMC10775927.
3. Khan F, Tritschler T, Kahn SR, Rodger MA. Venous thromboembolism. Lancet. 2021 Jul 3;398(10294):64-77. doi: 10.1016/S0140-6736(20)32658-1. Epub 2021 May 10. PMID: 33984268.
4. Khalafallah AA, Kirkby BE, Wong S, Foong YC, Ranjan N, Luttrell J, et al. Venous thromboembolism in medical patients during hospitalisation and 3 months after hospitalisation: A prospective observational study. BMJ Open 2016;6:e012346.
5. Hung, Shih-Hana; Lin, Herng-Chingb; Chung, Shiu-Dongb,c. Association between venous thromboembolism and iron-deficiency anemia: a population-based study. Blood Coagulation & Fibrinolysis 26(4):p 368-372, June 2015. | DOI: 10.1097/MBC.0000000000000249
6. Fu H, Hou D, Xu R,
7. venous thrombosis in patients with acute stroke: a systematic review and meta-analysis. International Journal of Nursing Studies. 2024 Jan 1;149:104623.
8. Visconti L, Celi A, Carrozzi L, Tinelli C, Crocetti L, Daviddi F, De Caterina R, Madonna R, Pancani R. Inferior vena cava filters: Concept review and summary of current guidelines. VasculPharmacol. 2024 Jun;155:107375. doi: 10.1016/j.vph.2024.107375. Epub 2024 Apr 24. PMID: 38663572.