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Epidemiology and Management of Deep Vein Thrombosis in a Tertiary Care Centre

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Abstract

Background: Deep Vein Thrombosis (DVT) is a major contributor to morbidity and mortality among hospitalized patients. Regional data on risk factors, treatment patterns, and outcomes are limited in low-middle-income countries like India. This study aims to analyze the epidemiology and management of DVT in a tertiary care hospital.

Methods: A retrospective observational study was conducted at a tertiary care hospital from January 2021 to July 2024. Data of 243 admitted patients with confirmed DVT were collected and analyzed, focusing on demographic characteristics, risk factors, treatment modalities, and outcomes. Rivaroxaban was the preferred oral anticoagulant after initial low molecular weight heparin (LMWH) therapy. No patient received an inferior vena cava (IVC) filter.

Results: Of 243 patients, 116 (47.7%) were male. The most common risk factors included hypertension (48.1%), postpartum state (32.1%), diabetes (28.4%), postoperative status (24.3%), chronic kidney disease (17.3%), and cancer treatment (8.6%). DVT was located in the lower limb in 192 (79%) patients. All patients received LMWH initially; 91% were transitioned to rivaroxaban. Systemic thrombolysis was performed in 22 (9.1%) patients. Eight patients (3.3%) died, and five (2.1%) developed pulmonary embolism. Complete recovery was observed in 87.2%.

Conclusion: This study highlights the significant burden of DVT among hospitalized patients, particularly those with hypertension, postpartum status, and diabetes. The use of LMWH followed by rivaroxaban proved effective and safe, with minimal complications. Strengthening thromboprophylaxis protocols in high-risk patients may improve outcomes.

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Introduction

Deep Vein Thrombosis (DVT) is a significant and potentially life-threatening condition characterized by the formation of thrombi in the deep venous system, primarily affecting the lower extremities. It is a major cause of preventable hospital-related morbidity and mortality. The global incidence of DVT varies, with estimates of approximately 1 per 1000 adults annually. However, data from India remains sparse, especially from tertiary centers, despite the high burden of known risk factors such as immobility, surgery, malignancy, and pregnancy-related changes.

Given the increasing prevalence of non-communicable diseases and hospital admissions, the risk profile for DVT is evolving. This study aims to fill the knowledge gap by analyzing the demographic patterns, clinical characteristics, management strategies, and outcomes of DVT cases admitted over a four-year period in a tertiary care center.

Materials and Methods

A retrospective observational study was conducted at a tertiary care hospital in Northern India, analyzing all patients admitted with a diagnosis of DVT from January 2021 to july 2024. Ethical clearance was obtained prior to data extraction. Inclusion criteria were patients of all ages with a radiologically confirmed diagnosis of DVT. Exclusion criteria included incomplete records or transfer before initiation of treatment.

Data extracted from hospital records included age, sex, risk factors (hypertension, diabetes, postpartum status, postoperative state, cancer, CKD, catheterization, trauma), location of thrombus, treatment protocols, and outcomes.

All patients received LMWH as initial therapy, followed by transition to oral anticoagulants, with rivaroxaban being the preferred agent. IVC filter use was not practiced in any patient. Descriptive statistics were used for analysis.

Results

Table 1: Demographic and Clinical Characteristics (n = 243)

Characteristic	Number (n)	Percentage (%)
Total Patients	243	100%
Male	116	47.7%
Female	127	52.3%
Mean Age (years ± SD)	48.6 ± 14.2	-

Table 2: Risk Factors and Comorbidities

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Risk Factor	Number (n)	Percentage (%)
Hypertension	117	48.1%
Postpartum (females only)	78	32.1%
Diabetes Mellitus	69	28.4%
Postoperative State	59	24.3%
Chronic Kidney Disease (CKD)	42	17.3%
Active Malignancy/Cancer Therapy	21	8.6%
IV Catheter-Induced	12	4.9%
Post-Traumatic	10	4.1%

Table 3: Location of DVT

Location	Number (n)	Percentage (%)
Lower Limb	192	79.0%
Upper Limb	51	21.0%

Table 4: Treatment Modalities

Treatment	Number (n)	Percentage (%)
LMWH as Initial Therapy	243	100%
Transition to Rivaroxaban	221	91.0%
Continued LMWH (CKD/others)	18	7.4%
Warfarin (cost-related)	4	1.6%

Table 5: Outcomes

Outcome	Number (n)	Percentage (%)
Complete Recovery	212	87.2%
Recurrent DVT	3	1.2%
Pulmonary Embolism	5	2.1%
Deaths	8	3.3%
Loss to Follow-Up	15	6.2%

Discussion

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The present study provides a comprehensive overview of DVT in a tertiary care setting in India, encompassing patient demographics, risk factor profiling, treatment strategies, and clinical outcomes over four years. Several notable findings emerged from the analysis:

1. **Risk Factor Prevalence:** The leading risk factors in our cohort—hypertension, postpartum state, diabetes, and postoperative status—are in line with trends seen in other Indian and international studies. Hypertension was the most prevalent comorbidity, highlighting the growing importance of vascular health in thrombosis prevention. The postpartum group accounted for nearly one-third of female DVT patients, emphasizing the need for enhanced awareness and prophylaxis during the perinatal period.
2. **Rising Burden in Non-Malignant Conditions:** While malignancy remains a known prothrombotic state, our findings show that common non-malignant comorbidities such as diabetes and CKD are also significant contributors. CKD patients in particular represent a therapeutic challenge, often necessitating the continuation of LMWH instead of oral agents due to altered renal clearance.
3. **Treatment Practices:** All patients were initiated on LMWH, reflecting adherence to standard protocols. The transition to rivaroxaban in over 90% of cases underscores a shift toward direct oral anticoagulants (DOACs) due to their convenience and favorable safety profile. Our practice aligns with evidence from trials like EINSTEIN-DVT, which support the use of rivaroxaban as an effective alternative to warfarin.
4. **Avoidance of IVC Filters:** Notably, no patient in our cohort required an IVC filter. This is in harmony with recent guidelines discouraging routine use unless contraindications to anticoagulation exist. Avoiding unnecessary filter placement not only reduces costs but also prevents complications such as filter thrombosis and migration.
5. **Favorable Outcomes:** The high rate of complete recovery (87.2%) and low mortality (3.3%) are encouraging and likely reflect timely diagnosis, adherence to treatment protocols, and close monitoring. The few deaths observed occurred in patients with advanced systemic illness or delayed presentation.
6. **Need for Prophylaxis:** Our findings underscore the importance of proactive risk stratification and prophylaxis in high-risk groups, particularly in postoperative and obstetric settings. Integrating DVT prevention strategies into hospital protocols—such as mechanical prophylaxis and early mobilization—could further reduce incidence.
7. **Limitations:** As a retrospective study, limitations include possible selection bias, missing data on thrombophilia and obesity, and lack of long-term follow-up in some patients. Additionally, socioeconomic factors influencing access to DOACs were not analyzed.

Conclusion

DVT remains a major health concern in hospitalized patients with multimorbidity. Prompt diagnosis and management using LMWH followed by rivaroxaban result in favorable outcomes. Risk-based thromboprophylaxis, patient education, and protocol-driven care are crucial for preventing complications.

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