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Efficacy and Outcomes of Low Molecular Weight Heparin in the Management of Deep Vein Thrombosis: A Cross-Sectional Study.

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ABSTRACT

Low molecular weight heparin (LMWH) has transformed the management of deep vein thrombosis (DVT), enabling early stabilization and outpatient care. However, Indian data on LMWH outcomes remain sparse. To evaluate the efficacy and outcomes of LMWH in patients with DVT. Methods: This hospital-based cross-sectional study included 80 patients with Doppler-confirmed DVT treated with LMWH and warfarin. Hospital stay duration, incidence of pulmonary embolism (PE), treatment outcome, and adverse events were systematically recorded. Half the patients (50%) had hospital stays of 5–7 days. PE occurred in 7.5% of patients during hospitalization. Complete resolution of DVT was achieved in 90% of cases, with partial resolution in 7.5%. Adverse events were minimal, with 6.25% experiencing minor bleeding and 2.5% developing thrombocytopenia. LMWH is a safe and effective option for DVT management, enabling early discharge and excellent clinical outcomes. These findings support its wider adoption and encourage development of outpatient treatment models in the Indian healthcare context.
Keywords: Deep vein thrombosis, low molecular weight heparin, treatment outcome.

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INTRODUCTION

Deep vein thrombosis (DVT) is a critical condition requiring prompt anticoagulation to prevent complications such as pulmonary embolism and post-thrombotic syndrome. (1) Historically, unfractionated heparin (UFH) has been used for initial treatment; however, the advent of low molecular weight heparin (LMWH) has revolutionized the management of DVT. LMWH offers superior pharmacokinetics, including predictable anticoagulant response, longer half-life, reduced need for monitoring, and lower incidence of heparin-induced thrombocytopenia. (2,3) Moreover, LMWH facilitates outpatient treatment and reduces hospital stay duration. (4,5,6) Although international guidelines recommend LMWH as first-line therapy, data regarding its real-world application and outcomes in the Indian healthcare context remain limited. (7) This study aimed to evaluate the use of LMWH in patients with DVT, focusing on hospital stay duration, incidence of pulmonary embolism, and treatment outcomes.

METHODOLOGY

This hospital-based cross-sectional study was conducted over two years (2020–2023) in the Department of General Medicine. Ethical clearance was obtained, and informed consent was secured from all participants.

Patients diagnosed with DVT by Doppler ultrasonography were included. All patients received LMWH (enoxaparin) as per institutional protocol, with dosing based on body weight. Warfarin was initiated concurrently, with LMWH continued until therapeutic INR was achieved.

Clinical outcomes assessed included hospital stay duration, incidence of pulmonary embolism during hospitalization, and overall treatment outcome. Adverse events related to LMWH were also recorded. Data were collected prospectively using a standardized case record form.

Data were analyzed using descriptive statistics. Frequencies, percentages, and mean values were computed to summarize the outcomes. The efficacy of LMWH was inferred from hospital stay trends and clinical outcomes.

RESULTS

Table 1: Duration

Duration (days)	No. of Patients (%)
<5	20 (25%)
5–7	40 (50%)
8–10	15 (18.75%)
>10	5 (6.25%)

Table 2: Embolism

Pulmonary Embolism	No. of Patients (%)
Yes	6 (7.5%)
No	74 (92.5%)

Table 3: Outcome

Outcome	No. of Patients (%)
Complete Resolution	72 (90%)
Partial Resolution	6 (7.5%)
No Response/Progression	2 (2.5%)

Table 4: Adverse event

Adverse Event	No. of Patients (%)
Minor Bleeding	5 (6.25%)
Thrombocytopenia	2 (2.5%)
No Adverse Event	73 (91.25%)

Discussion

This study evaluated the use of low molecular weight heparin (LMWH) in patients diagnosed with deep vein thrombosis (DVT) at a tertiary care center. The results provide valuable insights into the efficacy and safety of LMWH in this clinical context. A majority of patients (50%) had a hospital stay of 5–7 days, indicating that LMWH enables early stabilization and discharge in most cases. The relatively short hospitalization duration aligns with global literature advocating LMWH's role in promoting outpatient or early discharge management of DVT. (8,9)

Our findings are consistent with those of Hauer et al50 and Breddin et al51, who reported similar reductions in hospital stay with LMWH use. Pulmonary embolism (PE), the most feared complication of DVT, was observed in only 7.5% of our cohort during hospitalization. This low incidence may reflect the efficacy of early anticoagulation with LMWH. Moreover, 90% of patients achieved complete resolution of DVT, reinforcing the effectiveness of LMWH-based therapy. These results resonate with studies by Büller et al52 and W Ageno et al53, which demonstrated comparable or superior outcomes of LMWH over unfractionated heparin. (10,11)

Adverse events were minimal, with only 6.25% experiencing minor bleeding and 2.5% developing thrombocytopenia. No major bleeding events were reported, highlighting the favorable safety profile of LMWH. This is supported by prior studies (Koopman et al37, Charbonnier BA et al54) that also reported low complication rates with LMWH. Importantly, LMWH's predictable pharmacokinetics and reduced need for laboratory monitoring facilitated streamlined management.

The present study underscores the potential for further optimizing resource utilization by expanding outpatient treatment pathways for stable DVT patients. In conclusion, our findings affirm LMWH as a highly effective and safe anticoagulation option for DVT management in the Indian clinical setting. The study supports its broader adoption and suggests that further efforts toward outpatient care models could enhance patient outcomes and healthcare efficiency.

CONCLUSION

LMWH is a safe and effective option for DVT management, enabling early discharge and excellent clinical outcomes. These findings support its wider adoption and encourage development of outpatient treatment models in the Indian healthcare context.

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