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Original Article

Deep vein thrombosis prophylaxis in a tertiary care center: An observational study

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ABSTRACT

Background: Deep vein thrombosis (DVT) is a major health problem with substantial mortality and morbidity in medically ill patients. Prevention of DVT by risk factor stratification and subsequent antithrombotic prophylaxis in moderate- to severe-risk category patients is the most rational means of reducing morbidity and mortality.

Objective: To study the management strategies for DVT prophylaxis in a tertiary care center and evaluate the prophylactic dosing patterns for DVT prevention.

Methods: A prospective, observational study was performed in the intensive care units and medical wards of a tertiary care center. A structured proforma was designed for risk assessment and stratification of DVT in critically ill patients with recommended thromboprophylaxis. The dosing patterns of all medications given for DVT prophylaxis were analyzed for their appropriateness according to 8th ACCP guidelines.

Results: A total of 480 patient charts were reviewed. It was observed that 358 patients (74.6%) were on mixed prophylaxis, 38 patients (18.5%) were on pharmacological prophylaxis, and 33 patients (6.9%) were on mechanical prophylaxis only. Enoxaparin and graduated compression stockings were the most commonly used pharmacological and mechanical prophylaxes, respectively. The prophylaxis guidelines were followed in 77% of the study population. The reasons for inappropriate dosing patterns were found to be subtherapeutic dosing and overdosing.

Conclusions: Our study revealed that a higher proportion of the patients who are at high risk are currently given thromboprophylaxis as per the standard prophylactic recommendations. There is still considerable scope for improvement in the management of DVT in all units of the institution.

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1. Introduction

Venous thromboembolism (VTE), which includes deep venous thrombosis (DVT) and pulmonary embolism (PE), is a common and potentially life-threatening condition in critically ill patients. Anticoagulant drug therapy is aimed at preventing pathological clot formation in patients at risk and preventing clot extension and/or embolization in patients who have developed thrombosis.[1,2]

Majority of the studies have been conducted and published in western countries where DVT is more common, whereas, there is paucity of data from Indian subcontinent regarding the incidence of VTE. Some of the recent studies published from Asian countries have shown that DVT is not a rarity in Asian patients as was thought earlier.[3] The prevailing belief that VTE in the ASIAN population is less than in the western population has been disproved by recent studies and there appears no reason to believe that it is any different in India.[5]

The incidence of DVT in India as reported is 1% of the adult population after the age of forty and 15–20% in hospitalized patients. The risk of DVT is 50% in patients undergoing orthopedic surgery, particularly involving the hip and knee, and it is 40% in patients undergoing abdominal or thoracic surgery. About 1 in 100 who developed DVT can develop PE, which can be fatal. As per India-specific ENDORSE study data presented at Geneva, 50% of hospitalized patients in India are at high risk of developing VTE at any point in time and the proportion of Indian patients considered at risk for VTE (53.6%) was similar to that of the global patients at risk for VTE (51.8%).[3,4,6]

In developing countries, such as India, a significant prevalence of etiological risk factors for DVT and prothrombotic factors has been shown amongst hospitalized patients.[7] Studies have shown a need of DVT prophylaxis in 95% of intensive care unit (ICU) patients in India with significant underuse of prophylaxis in only 55% of the high-risk patients.[8] Another study in the Indian population has shown an overall incidence of confirmed DVTs to be 17.46 per one lakh patients with 64% being nonsurgical non-trauma patients.[9]

Critically ill patients are at increased risk of VTE due to predisposing comorbid conditions, occurrence of sepsis, trauma, and postadmission events.[10] Individual identification of suspected DVT cases could be a difficult task and many cases could be missed. However, blanket prophylaxis of all admitted patients may not be cost-effective, especially in a developing country, such as India.[11] Thus primary prevention of VTE with risk assessment and stratification for DVT and subsequent antithrombotic prophylaxis in moderate- to severe-risk category patients is the most rational means of reducing mortality and morbidity.

The need for DVT prophylaxis is usually underestimated. Only 10% of individuals who require DVT prophylaxis actually get it; the remaining 90% of individuals are deprived of DVT prophylaxis because of lack of awareness or skill.[12]

The 8th conference of American College of Chest Physicians (ACCP) developed guidelines for the use of low-molecular weight heparins (LMWHs) and unfractionated heparins (UFH) in the prevention of VTE in patients with acute illnesses.[12]

DVT can be prevented by regular physical activity, especially if an individual is immobilized for longer time. Mechanical DVT prophylaxis may be considered in all immobile patients and should be used for those who cannot receive anticoagulants, such as intermittent pneumatic compression (IPC) devices, graded compression stockings (GCS), and venous foot pumps. Pharmacological prophylaxis includes low-dose unfractionated heparin (LDUH), LMWH, vitamin K antagonists (most often warfarin), and fondaparinux. The guideline recommendations for thromboprophylaxis in patients at risk of VTE are given in Appendix.[14]

However, the use of DVT prophylaxis in hospitalized medical patients still remains suboptimal, around 15–16%.[13]

Hence, we sought to study the patient profiles for risk factors and evaluate the drug dosing patterns for DVT prophylaxis among medically ill and surgical patients treated at our institution. This study aims to evaluate the usage of prophylaxis in our institution.

2. Methods

A single-center, prospective, and observational study was carried out for six months at Apollo Hospitals, Jubilee Hills, Hyderabad, which is a 630 bedded tertiary care hospital with 50 superspecialty services in India. Ethical clearance was obtained from the Institutional Ethics Committee (IEC) (Protocol No. SVCP/04/2013) before initiating the study.

A structured proforma was designed for risk stratification of DVT in critically ill patients adapted from Caprini's risk stratification scorecard. The risk factors for DVT used in this protocol to stratify patients are similar to that published by ACCP and the International Union of Angiology (IUAS) consensus statement and have been used previously for DVT risk assessment alongside ACCP and IUAS risk score models in other studies done in developing countries. The risk assessment and stratification scorecard and data collection form used are given in Appendix.

All the patient charts were reviewed in the medical and surgical units and the data of 480 patients who were on DVT prophylaxis were collected. Individual Risk factor screening was done to calculate risk factor score, thus categorizing patients into low, moderate, and high risk.

Demographic data, including patient's age, sex, and body weight, were collected. Other baseline information like diagnosis, comorbidities, past medication history, past surgical history, family history, social history, allergies, any invasive instrumentation, such as ventilators, venous catheters, baseline laboratory data (hematological data, coagulation profile and renal parameters), etc. were also noted down. Renal data plays a crucial role because as per enoxaparin package insert dose adjustment is recommended in patients with severe renal impairment (creatinine clearance <30 mL/min). Patients were stratified to low-, moderate-, and high-risk categories. Any prophylaxis given and relevant investigations for DVT (D-dimer, Doppler ultrasound, high-resolution chest computed tomography, pulmonary angiography) that was done was also noted. Assessment of risk of bleeding and contraindications to thromboprophylaxis was performed. The current prescribed prophylaxis (mechanical and chemical)