

Utilisation of deep venous thrombosis prophylaxis in medical / surgical intensive care units

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Abstract

Background: Pulmonary embolism is the most common preventable cause of death in hospitalised patient. It can readily be prevented by adequate prophylaxis. In spite of multiple guidelines on risk factor assessment for venous thromboembolism (VTE), utilization of deep venous thrombosis (DVT) prophylaxis remains less than satisfactory. Critically ill patient are at increased risk of developing VTE which leads to significant morbidity and mortality in this population. In western intensive care units utilization of DVT prophylaxis varies from 40-90%. There has not been a systematic study to detect the incidence of DVT prophylaxis in India.

Objective: To assess the utilization of Deep Venous Thrombosis (DVT) prophylaxis in Multidisciplinary critical care unit.

Design: Prospective Cohort Multi-centre Study.

Setting: Multidisciplinary critical care units in the Metropolitan city of Kolkata (India).

Method: Prospective chart survey of one hundred consecutive ITU admissions.

Results: Of 100 consecutive admissions who were eligible for DVT prophylaxis, as per predefined criterias, DVT prophylaxis was administered to 44 of 100 study patients (44%). Fifty-six eligible study patients (56%) did not receive DVT prophylaxis. The study patients had an average of 2.9 risk factors for DVT. Thirty patients received subcutaneous heparin, twenty six of which were low molecular weight heparin (LMWH), thirteen patients received anti embolism stockings, one patient received both LMWH and antiembolism stockings.

Conclusion: Forty four percent (44%) of the medical /surgical critically ill patient included in our study received DVT prophylaxis.

Key Words: Intensive Care Unit, Prophylaxis, Venous Thromboembolism.

In the orthopedic and surgical settings use of DVT prophylaxis has been very well studied and their usefulness established.¹ In the medically sick patient, specially in the critically ill there have been very few studies about usefulness of DVT prophylaxis. Recent multicentre

randomized trials of DVT prophylaxis in hospitalized patient mainly included non critically ill patient.² Risk assessment models for DVT prophylaxis indicate that ICU patient share common risk factors for venous thromboembolism.³ In the absence of clear cut guidelines for ICU population one can only extrapolate the recommendation for DVT prophylaxis for medically ill patient to these sickest group of patients.⁴ Implementation of these guidelines has been very varied with different studies ranging from 30% -90%.^{5,6} In India, utilization of such prophylaxis has not been systematically studied.

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Material & Methods

The medical records of all consecutive medical/ surgical ITU admissions, who stayed in ITU for more than 24 hrs were evaluated during the month of August 2001. Risk factors for DVT were recorded. The charts were surveyed for inclusion and exclusion criteria. One hundred consecutive patients who satisfied the inclusion criteria and did not meet any exclusion criteria were entered into the study. The study patients' chart were studied to record date of admission to ITU, clinical diagnosis, whether DVT prophylaxis was implemented and type and timing of DVT prophylaxis. Contraindication of heparin therapy if any was also noted.

Inclusion Criteria

- Two risk factors for DVT + stay in ITU > 24 hrs
- One risk factor for DVT + stay in ITU > 48 hrs

Risk Factors

Age:

- Older than 40 yrs.
- Older than 70 yrs (two risk factors)
 - Obesity (>20% ideal body wt.)
 - Active malignant disease
 - Left ventricular systolic dysfunction
 - Prior thromboembolic disease
 - Respiratory failure
 - Acute or chronic paresis
 - Pelvic or long bone fracture
 - Major trauma
 - Major surgery
 - Pregnancy/ Postpartum
 - Recent M.I
 - Diagnosed hypercoagulable state
 - Estrogen use

Exclusion Criteria

- Prior entrance into this study during the same hospitalization
- ICU admission diagnosis of DVT or PE
- Involvement of the investigator in the care of the patient before or during the study period
- Death within 24 hr of ICU admission
- No risk factor other than bed rest
- One risk factor but out of bed and out of ICU within 48 hrs.
- More than one risk factor but out of bed or out of ICU within 24 hrs.

- Patient already on Heparin

Results

Eight hundred patients were screened in the participating hospitals during the study period. Of 100 consecutive admissions who were eligible for DVT prophylaxis, as per predefined criteria, DVT prophylaxis was administered to 44 of 100 study patients (44%). Fifty-six eligible study patients (56%) did not receive DVT prophylaxis. (Table 1) Thirty three (n=33) patients were surgical and Sixty seven (n=67) were medical patients. (Table 1) The study patients had an average of 2.9 risk factors for DVT. 90% of DVT prophylaxis were administered within 24 hrs of hospital admission, the range being one day to twenty six days. (Table 2) Thirty patients received subcutaneous heparin, twenty six of which were low molecular weight heparin (LMWH), thirteen patients received anti embolism stockings, one patient received both LMWH and antiembolism stockings (Table 3).

Discussion

Our study highlights the fact that roughly one out of two critically ill patients who are eligible for VTE prophylaxis are currently not getting it in state of the art intensive care unit in a metropolitan city. The utilization varied from 40-60 percent in different centres. Our study was not designed to address the issue of incidence of DVT and PE in these patients, nor any attempt was made to determine the reasons for underutilization of such prophylaxis. Nevertheless, our data is in tune with some western data which sites similar incidence of underutilization. Though in one study from St. Louis USA, the utilization for DVT prophylaxis was as high as 90%

Table 1: Patient Profile

Total no. of study patients	100
Medical	67
Surgical	33
DVT prophylaxis given	44 (44%)
DVT prophylaxis not given	56 (56%)

Table 2: DVT prophylaxis timing

Timing of DVT prophylaxis	< 24 hrs (90%)
Range	1-26 days

Table 3: Type of DVT Prophylaxis

Anti embolism stocking	13
Low Molecular Weight Heparin (LMWH)	26
Unfractionated Heparin	4
Stocking + LMWH	1

and the reason cited was that the centre has a "closed" ICU with all patients seen by ICU team, a quality assurance program and education of doctors and nurses on DVT prophylaxis were regularly carried out and the consultant had a special interest in DVT prophylaxis.⁶ In the absence of portable duplex scanners, and portable gamma camera diagnosis of DVT and PE becomes difficult in immobile patients in most of the centres in India. Moreover, the apprehension of bleeding risks make many physician apprehensive to use such prophylaxis.

Recent multicentre trial have conclusively shown that the risks of clinically significant bleed is negligible and is equal to placebo.² Cost of low molecular weight heparins might be another deterrent in using DVT prophylaxis, but studies have shown unfractionated heparin to be equally effective in preventing DVT in this population.⁷ Physical measures for DVT prophylaxis like stocking and pneumatic compression devices are also underused in our country due to the cost and lack of easy availability. Current risk assessment models for medically ill patient and guidelines and recommendation of various societies makes it very clear that specific subgroups of ICU population like patients on mechanical ventilation, patients with femoral catheters are at a very high risk for DVT and PE and must always receive VTE prophylaxis.⁸⁻¹⁰ It is only by close vigilance and quality control we can achieve the goal of preventing the catastrophe of a fatal PE in our patients.

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