

A Clinical Audit on Venous Thromboembolism Prophylaxis of medical patients in West Medical Ward, Mayo Hospital

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Objective: To reduce risk of Deep Venous Thrombosis/ Pulmonary Embolism in an acutely ill hospitalized medical patient and the consequent clinical complications. **Place and duration:** The study was carried out in the West Medical Unit of Mayo Hospital, Lahore from January, 2005 to May, 2005. **Subjects and methods:** A total of 100 cases were selected from the patients hospitalized in the ward on the basis of presence of risk factors with no contraindications to heparin prophylaxis, taking into account the age, gender, final diagnosis of the patient, the existing risk factors, the risk stratification, the exclusion criteria, whether heparin prophylaxis was given or not, if given type of heparin administered, and whether patients receiving prophylaxis were monitored or not using Platelet Count, APTT or other monitoring techniques. **Results:** 19 cases were under Moderate Risk of developing Venous Thromboembolism (VTE) and 81 cases were under High Risk. 7 received Heparin prophylaxis. 3 of them were at Moderate Risk and 4 cases at High Risk of developing VTE. **Conclusion:** All acutely ill medical adult patients admitted should be adequately assessed and screened for presence of Risk Factors and categorized according to the SAVE Risk Stratification. In the absence of Exclusion factors, all cases of High Risk and Moderate Risk should be started on Heparin Prophylaxis as early as possible in hospital admission. The audit should be repeated for re-evaluation after adequate time.

Key words: Clinical audit, venous thromboembolism, SAVE, Risk Stratification

Venous Thromboembolism (VTE) is a common disease that affects more than 2 million people each year, and which may be responsible for up to 200,000 deaths annually. Although VTE is often considered to be associated with recent surgery or trauma, physicians should be aware that the risk for acquiring venous thromboembolism (VTE) among seriously ill medical patients ranges from about 5% to 20%.¹ Hospitalization for an acute medical illness is independently associated with about an eight-fold increased relative risk for VTE and accounts for almost one quarter of all VTE events in the general population.²

Major risk factors include New York Heart Association class III and IV heart failure, COPD exacerbations with respiratory failure, and sepsis (Pneumonia, Urinary Tract Infection, Abdominal Infections and Soft Tissue and Skin Infections). Additional risk factors include advanced age (>65 years), history of VTE, cancer, ischemic stroke with lower extremity weakness, and bed rest (>3days) and hyper-coagulability. Many medical patients have multiple risk factors².

VTE prophylaxis will be conducted in the absence of *exclusion criteria*. The factors negating a patient's eligibility for VTE prophylaxis include documented bleeding disorder, recent surgery in past 3 months, uncontrolled hypertension, abnormal clotting time, hypersensitivity to UFH (Unfractionated Heparin) or LMWH (Low Molecular Weight Heparin), pregnancy.

The *risk stratification* of a patient according to SAVE is as follows:

Patient is considered at HIGH RISK for developing VTE if he/she

- Is 65 years or older plus one major risk factor/medical illness

- Has two or more major risk factors/ serious medical illness. Patient is considered at MODERATE RISK for developing VTE if he/she
- Is less than 65 years of age plus one major risk factor/ serious medical illness. Patients is considered at LOW RISK for developing VTE if he/she
- Is of any age with no major risk factor VTE Prophylaxis is indicated in HIGH RISK and MODERATE RISK cases³.

VTE prophylaxis can be achieved with either UFH or LMWH. UFH and LMWH have been directly compared in five randomized clinical trials. Four of the studies showed no significant differences in DVT rates or bleeding. In one meta-analysis, there was no significant difference in the risk of VTE or death between patients receiving UFH and LMWH, but LMWH therapy was associated with a lower incidence of major bleeding (1.2% vs 0.4%, respectively)². The *dosage* of

- LMWH (Enoxaparin) is 40mg Subcutaneous, Once Daily for a minimum of 6 Days³
- UFH is 5000iu Subcutaneous, Twice Daily.

Thus, on the basis of above-mentioned facts and statistics a *clinical audit* was conducted in West Medical Ward, Mayo Hospital to determine whether ward performance met the clinically set standards of Venous Thromboembolism Prophylaxis in Acutely Ill Hospitalized Medical Patients. The purpose of the audit is to do a review of clinical performance of the ward, the refining of clinical practice as a result and the measurement of performance against agreed standards – a cyclical process of improving the quality of clinical care⁵.

Objectives:

The *objectives*³ of this clinical audit is

- To reduce risk of Deep Venous Thrombosis/ Pulmonary Embolism in an acutely ill hospitalized medical patient
- To reduce risk of clinical complications, Thus,
- Improving clinical outcomes
- Reducing Morbidity and Mortality
- Earlier Hospital Discharge

Audit criteria

“An audit criterion is a specific statement/statements of what should be happening.”⁵

- ❖ All Acutely Ill Medical Adult Patients under High Risk and Moderate Risk of developing VTE are indicated for Heparin Prophylaxis where there are no exclusion factors present, as early in the hospital admission process as possible.⁴
- ❖ All patients receiving Heparin Prophylaxis where indicated should be monitored for impending bleeding or hemorrhages.
All patients where Heparin Prophylaxis is indicated, the socioeconomic status should be assessed and type of Heparin should be decided accordingly

Audit standards

“An audit standard is the minimum level of acceptable performance for the audit criterion”⁵

- ❖ 95% of acutely ill medical adult patients under High Risk of developing VTE, with no excluding factors should receive Heparin Prophylaxis.
- ❖ 80% of acutely ill medical adult patients under moderate risk of developing VTE, with no excluding factors should receive Heparin Prophylaxis.

Patients and methods:

The clinical audit was conducted between the months of January 2005 and May 2005 on the patients admitted in a West Medical Ward of a Mayo Hospital. A total of 100 cases were selected from the patients hospitalized in the ward. Selection was on the basis of presence of risk factors with no contraindications to heparin prophylaxis, according to the exclusion criteria. Data was collected on a specially designed form taking into account the age, gender, final diagnosis of the patient, the existing risk factors as listed on the Performa, the risk stratification accordingly, a list of exclusion criteria, whether heparin prophylaxis was given or not, if given type of heparin administered, and whether patients receiving prophylaxis were monitored or not using Platelet Count, APTT or other monitoring techniques.

The Risk Factors included, Age >65 years, past history of VTE, Obesity, Ischemic stroke, Heart Failure (Class III-IV), Chronic Lung Disease, Respiratory Failure, Pneumonia, Infection/Sepsis, Active Collagen-Vascular

Disorder, Malignancy, Inflammatory Disorder, Central Venous Line, Varicose Veins, Birth Control Pills, Estrogen Replacement Therapy, Nephrotic Syndrome, Immobilization >3days, Others (included Diabetic Ketoacidosis and Hyper Osmolar Non-Ketotic Coma, as Heparin Prophylaxis is indicated in these patients⁶. The Risk Stratification of the cases was according to SAVE Risk Stratification, as mentioned above.

The Exclusion Criteria was, Bleeding (active), Hypersensitivity to UFH, Uncontrolled Hypertension, Renal Insufficiency (Creatinine Clearance <30ml/min), Coagulopathy, Heparin-induced Thrombocytopenia, Recent Intraocular or Intracranial Surgery, Spinal tap or Epidural Anesthesia with in 12 hr.

Results and data analysis:

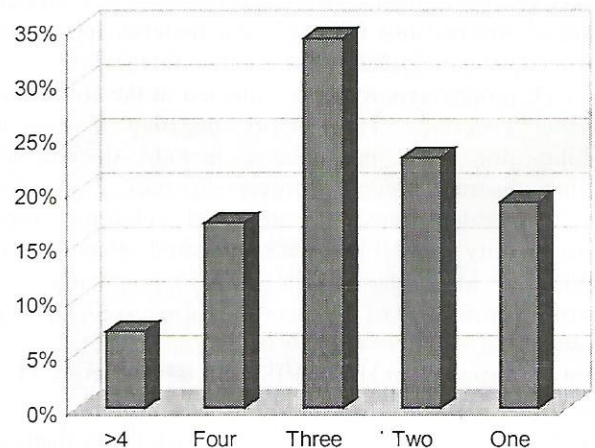
From the 100 cases taken, *male: female ratio* was 66:44, *age distribution* was 15-91 years with a mean age of 54.89 years. 19 cases were under Moderate Risk of developing VTE as according to the SAVE Risk Stratification, while 81 cases were under High Risk. Low Risk cases were not documented for the clinical audit. Of the 81 *High Risk Cases* having multiple (2 or more) risk factors, 7% had more than 4, 17% had 4, 34% had 3 and 23% had 2 risk factors. 7 received Heparin prophylaxis.

Three of them were at moderate risk and 4 being at High Risk of VTE. 3 out of 19 cases at Moderate Risk of VTE received Heparin prophylaxis. 4 out of 81 cases at high risk of VTE received Heparin Prophylaxis.

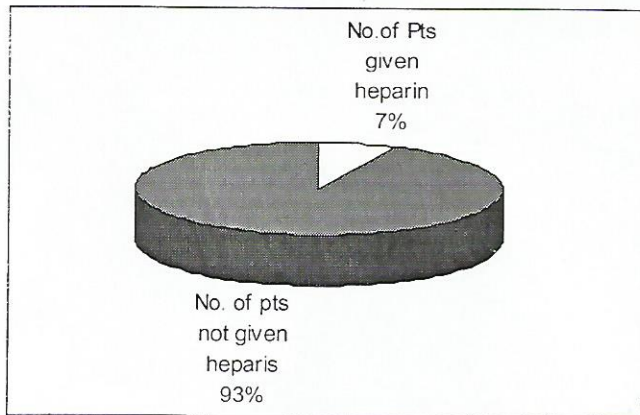
Heparin Prophylaxis was administered in the form of UFH to all 7 cases at the dose of 5000 IU, Subcutaneous, Twice Daily. 1 out of 7 cases receiving heparin prophylaxis, was monitored for prolonged clotting time by checking APTT every 3 days.

Considering the bulk of major risk factors, 15% fell under heart diseases, 42% were due to chronic respiratory diseases, 43% were miscellaneous

Graph 1: Percentage of risk factors



Graph II: Number of patients given heparin prophylaxis

**Comments:**

The actual percentage of patients receiving Heparin Prophylaxis against Venous Thromboembolism (VTE) falls far behind the standards we have set for this audit project. Only 4.93% of patients at High Risk of developing VTE are given prophylaxis in glaring contrast to the standard of 95% we had set. Similarly, only 15.79% of patients at Moderate Risk of developing VTE received heparin prophylaxis as compared to the standard of 80% set in this audit.

Keeping in mind the fact that the majority of patients received in Mayo Hospital, where this audit was conducted, are of poor socioeconomic status, administration of Unfractionated Heparin (UFH) would be cost-effective than Low-Molecular Weight Heparin (LMWH) (enoxaparin). UFH is available for free from the hospital management on an indent basis. There are studies available demonstrating comparable efficacies between Enoxaparin 40mg once daily, subcutaneous and UFH 5000iu, twice daily, with no major complications associated with one over the other, especially hemorrhage. Clinical judgment and individualization of patient circumstances are crucial when making decisions regarding prevention of VTE in medically ill patients.

Suggestions for implementation of change:

- All acutely ill medical adult patients admitted in the West Medical Unit, starting as early in hospital admission as possible, from the Accident and Emergency Department⁴ should be adequately assessed and screened for presence of Risk Factors and accordingly categorized into High Risk and Moderate Risk cases according to the SAVE Risk Stratification.

- All patients admitted in West Medical Unit, starting from the Accident and Emergency Department, falling under High and Moderate Risk of developing VTE, should be further assessed for presence or absence of Exclusion Criteria
- Type of heparin prophylaxis administered will depend on patient's socioeconomic status.
- The audit will be repeated in West Medical Unit to re-evaluate the situation on prevention of VTE in acutely ill medical patients admitted in the ward.

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