ORIGINAL ARTICLE

VENOUS THROMBOEMBOLISM RISK ASSESSMENT IN HOSPITALISED PATIENTS IN A TERTIARY CARE HOSPITAL IN PAKISTAN

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Background: Venous thromboembolism (VTE) ranks as the third most common cause of vascular death following myocardial infarction and stroke. VTE is a prevalent illness, particularly in the elderly, and is linked to a high recurrence rate, substantial healthcare costs, and reduced survival rates. The Objective of the study was to investigate the impact of using the VTE risk assessment (VTE-RA) tool and thromboprophylaxis (TP) on all adult patients hospitalized. M**ethods:** This study was conducted at a single centre using a prospective cross-sectional design to compare data before and after an intervention at a tertiary referral hospital in Pakistan from May 2019 to February 2020. All adult inpatients over the age of 18 were eligible for inclusion. **Results:** A total of 1,200 patients were screened in the study. The majority of these patients were medical 701(58.42%) and 499(41.58%) were surgical. The mean age of patients was 59.02±1.40 years. The male patients were 690(57.55%) as compared with females were 510(42.5%). The average stay in hospital was 8.01±1.11 days. At that time, there was no official RA instrument implemented. Researchers documented any written proof of RA in patients' medical records as "RA completed." 190(15.83%) out of all charts evaluated had a recorded VTE risk assessment. TP was prescribed to 450(37.5%) patients, which accounts for of the total. Risk factors for VTE in high-risk patients. **Conclusion:** VTE risk assessment, prescribing adequate thromboprophylaxis, and integrating it into practice is challenging. The majority of hospitalized patients investigated were at a high risk of having venous thromboembolism (VTE). The most prevalent risk factor for developing VTE is old age, however, only few hospitalized patients were actually given thromboprophylaxis.

Keywords: Venous thromboembolism; Risk Assessment; Vascular death

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INTRODUCTION

Venous thromboembolism (VTE) ranks as the third most common cause of vascular death following myocardial infarction and stroke. VTE is a prevalent illness, particularly in the elderly, and is linked to a high recurrence rate, substantial healthcare costs, and reduced survival rates. The prevalence of VTE in Europe and the USA is approximately cases per 1,000 person-years, with variations based on age, gender, race, and medical comorbidities.[1,2] Venous thromboembolism (VTE) rates are believed to be lower in Asia compared to Europe and the USA. The occurrence of VTE in South Korea was estimated to be 0.2 per 1,000 person-years.[3] There is limited data available for South America (Ceresetto) and Oceania. In Buenos Aires, Argentina, a study reported a VTE incidence rate of 0.7 per 1,000 person-years. In Perth, Australia, a study reported a VTE incidence rate of 0.8 per 1,000 person-years.[4,5] There is less knowledge regarding the occurrence of VTE in Africa. In Western countries, the annual VTE incidence ranges from 104 to 183 cases per 100,000 person-years. The incidence rate rises notably with age, from 1 case per 10,000 person-years before age 40 to approximately 5-6 cases per 1,000 person-years by age 80.[6] After accounting for age differences, venous thromboembolism (VTE) is more prevalent in males than females. Recurrence of venous thromboembolism is frequent following the cessation of anticoagulant therapy. The probability of experiencing an initial recurrence varies.[7] This is a prevalent venous thromboembolic (VTE) condition occurring at a rate of 1.6 per 1000 individuals per year.[1] The frequency of specific site involvement varies by anatomical location: distal veins 40%, popliteal 16%, femoral 20%.[8]

This paper focuses on hospital-acquired venous thromboembolism (VTE), which is typically described as VTE that occurs during or within 3 months after hospitalization and represents more than 50% of the total burden of VTE in the United

States. Extensive data from numerous randomized clinical trials completed in the last 30 years definitively shows that the correct use of primary thromboprophylaxis in high-risk hospitalized medical and surgical patients is safe, clinically efficacious, and cost-efficient in lowering VTE.[9] Despite the available data and evidence-based consensus guidelines, thromboprophylaxis is still not being administered properly or is being applied incorrectly. Population-based studies have indicated that there have been no decreases over time in both the incidence of VTE and case fatality rates. Furthermore, there is a lack of awareness among the public and healthcare providers on VTE, which is lower compared to other prevalent disorders.[10]

Venous thromboembolism risk in hospitalized patients with acute medical conditions can be categorized based on factors such as age, obesity, history of VTE, thrombophilia, cancer, recent surgery or trauma, tachycardia, acute myocardial infarction or stroke, leg weakness, congestive heart failure, prolonged bed rest, acute infection or rheumatologic condition, hormone therapy, central venous catheter, admission to intensive or coronary care units, white blood cell count, and platelet count.[11]

Several scientific organizations have provided suggestions for preventing VTE. The primary guideline often used is the one established by the American College of Chest Physicians (ACCP) in 2012, providing recommendations for both medical and surgical patients. The Antithrombotic Therapy for VTE Disease section was revised in 2016, [(12)] with no alterations in risk assessment or prophylaxis. Additional documents have been released by various medical organizations including the American College of Physicians, American Society of Clinical Oncology, American Society of Haematology, American Academy of Orthopaedic Surgeons, Society of Gynaecologic Surgeons, Eastern Association for the Surgery of Trauma, Trauma Quality Improvement Programme, and others.

The conventional approach of administering universal thromboprophylaxis to all hospitalized patients was superseded by the 2012 ACCP clinical practice guidelines for the prevention of VTE. This edition promoted preventative techniques based on patients' VTE risk scores, specifically recommending the use of risk stratification to help clinicians decide when to provide thromboprophylaxis.[13]

MATERIAL AND METHODS

The study design used for both the baseline and post-intervention investigations was cross-sectional. The Ethical Committee of Quaid-e-Azam Medical College, Bahawalpur granted ethical approval in 2019. Quaid e Azam Medical College in Bahawalpur is associated with Bahawal Victoria Hospital (BVH) and Civil Hospital Bahawalpur (CHB) for clinical training. The institution is affiliated with Bahawal Victoria Hospital, Civil Hospital, and Institute of Cardiology, which has a 2200-bed capacity. It offers over 30 medical and surgical specialties. It serves as the primary regional hub for a population of 762,111 individuals. Adult inpatients over 18 years old were included in the study, excluding maternity, paediatric, emergency, critical care, and psychiatric patients. Obstetrics/gynaecology patients were excluded due to the nationwide implementation of policies and risk assessment tools for this group. Patients receiving therapeutic anticoagulation were not included. Physicians, anticoagulation nurse specialists, and chemists collected the data. Information was gathered from the medical and drug prescription records of hospitalized patients and documented on *proforma* sheets. The demographics encompassed age, gender, admission date, reason for hospitalization, diagnosis, and co-morbidities.

The data collectors needed to check the patient's medical chart to determine if a VTE risk assessment was conducted upon admission or throughout hospitalization, given there was no specific risk assessment tool in place. The data collectors were directed to document any patient's risk of VTE or bleeding as a completed risk assessment. The data collectors had to examine the drug prescription file to establish whether the patient had been administered TP.

Initially, the hospital did not have an official thromboprophylaxis (TP) policy or risk assessment (RA) tool. The patient s' medical was examined for documented evidence of venous thromboembolism risk assessment (VTE-RA) and the prescription of thromboprophylaxis in their medication charts.[14] The study was the completion of the VTE-RA instrument in the drug prescription sheet, accompanied with the prescription of TP. In the absence of documentation, the researchers evaluated the risk of these individuals by utilising the medical information found in the patient's medical records and drug prescription charts. Patients were categorised into two risk groups based on a risk assessment following NICE clinical criteria. Preventing Venous Thromboembolism, this included a high risk of venous thromboembolism (VTE) with a low risk of bleeding; a high risk of VTE with a large risk of bleeding, and a low risk of VTE. The percentage of patients in each group that received TP. (NICE clinical guidelines 92, 2010)[15] other variables collected were: patients' demographics, VTE risk factors, their VTE risk category, their admitting consultant and consultant specialty.

RESULTS

Total 1,200 patients were screened in the trial. 701(58.42%) of the patients were medical cases, whereas 499(41.58%) were surgical cases. The average age of patients was 59.02±1.40. There were 690(57.55%) male patients compared as 510(42.5%) were female patients. The mean hospital stay duration was 8.01±1.11 days. At the time of research, there was no official RA instrument available. Researchers documented any written proof of RA in patients' medical charts as "RA completed." 170(14.83%) out of all charts evaluated had a recorded VTE -RA. TP was prescribed to 389(48.67%) of the total. (Table 1)

The post-intervention results of the study revealed an enhancement in VTE risk among RA patients. Initially, 850(84.33%) were classified as high risk for VTE. The patients with a higher risk of thrombosis experienced the greatest improvement in RA, from 189 (28.50%). The prescription of Thromboprophylaxis (TP) also increased in this category as 389(48.67%). (Table 2)

The findings of graph showed that patients at high risk of VTE with low risk of bleeding 11(29.56%) similarly TP prescription also decreased in this category as 15(41.45%).

Table-1: Demographics of study participants

Research Variables		**F (%)**
Medical Management		701(58.42%)
Surgical Procedure		499(41.58%)
Age (Mean±SD)		59.02±1.40
Gender	**Male**	690(57.55)
	Female	510(42.5%
Hospital Stay		8.01±1.11

Table-2: Patients VTE risk stratification in

Research Variables	**High Risk of VTE**	**Low Risk of VTE**
Number of Patients	850(84.33%)	32(4.81%)
VTE RA completed	170(14.83%)	11(29.56%)
Thromboprophylaxis	389(48.67%)	15(31.45%)

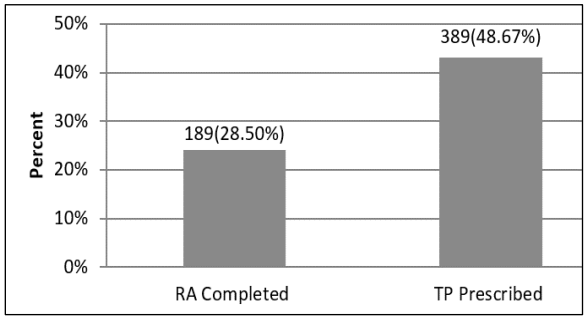

Figure-1: Proportion of patients who were risk assessed and prescribed thromboprophylaxis with high risk of bleeding

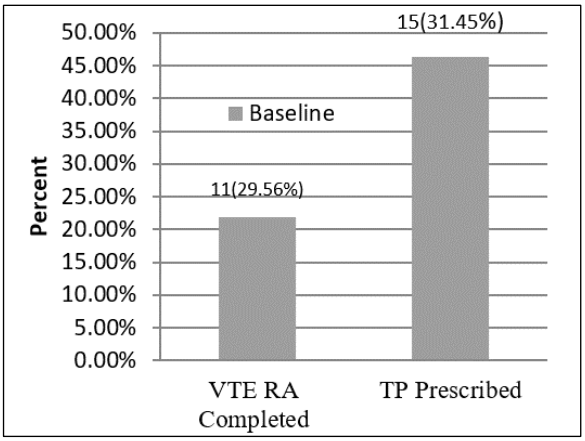

Figure-2: Patients at high risk of vte with low risk of bleeding

DISCUSSION

A cross-sectional study was carried out to show a lack of use of safe, effective, and recommended methods for preventing VTE. Only 25% of admissions included a VTE–RA documented in the medical records. Furthermore, physicians may lack information regarding the significance of RA and the methods available for VTE prevention. Physicians may lack awareness of the elevated rates of morbidity and mortality associated to VTE, and they might be overestimating the danger of bleeding. The NICE guidelines advise using the UK National VTE Risk Assessment tool for all admitted patients to reduce the risk of VTE. The RA tool accurately detects high-risk patients and also identifies low-risk patients who do not need TP. Administering thromboprophylaxis to individuals with a minimal risk of venous thromboembolism.

The analysis revealed that most patients were treated with drugs 701 (58.42%) while surgical procedures were used for 499 (41.58%) patients. The average age of patients was 59.02±1.40 years. There were 690(57.55%) male patients, of the total, and 510(42.5%) female patients. The mean duration of hospitalization was 8.01±1.11 days. At that time, there was no official RA instrument. Researchers documented any written proof of RA in patients' medical charts as "RA completed." 170(14.83%.) out of all charts evaluated had a recorded VTE risk assessment, TP was prescribed to 389(48.67%) of the total. Patient risk factors for VTE in the high-risk group.

In a study by Khan *et al*., they found that implementing the required VTE-RA instrument and TP policy led to a considerable increase in thromboprophylaxis prescription for high-risk VTE patients, rising from 380(46.3%) to 652(80.8%). As risk assessment in high-risk bleeding patients

increased, the prescription of TP fell from 49(28.8%) to 55(26.3%). Patients categorized as low risk for thrombosis had a decrease in TP prescription from 12(40%) to 8(22.2%) in the post-intervention audit.

The findings of current research showed that proportion was 850(84.33%) at baseline line information. The improvement in RA was highest in patients with increased risk of thrombosis from 189(28.50%), similarly Thromboprophylaxis (TP) prescription also increased in this category from 389(48.67%).

Previous research indicates that education alone leads to around a 37% improvement in TP prescribing in high-risk surgical and medical patients.[16] International studies have shown a 42–58% increase in appropriate TP prescription for hospitalised inpatients when a nurse-led program was implemented to change hospital culture and integrate VTE prevention processes into practice.[17,18]

Results from this study are comparable to a national audit carried out by Adamali, H. in 2013 which reported that 90% of patients were within the high-risk category for VTE.[19]Age was included as a risk factor in this study as per NICE 2010 guidelines [9] in which 53% of those in the high-risk group were older than 60 years. In Ireland, recent census data reveal that more than 33.2% of the hospitalized population are older than 65 years (excluding maternity) Another study shows that compared to surgical inpatients, medical inpatients had a higher risk of VTE. The results of the ENDORSE study show the opposite.[11]

In contrast to other countries, we still have a long way to go before thromboprophylaxis and VTE risk assessment become commonplace in healthcare. Venous thromboembolism (VTE) is a condition that often goes undetected due to its lack of noticeable symptoms. This raises the overall death rate related to receiving care both outside and in hospitals. Implementing a risk assessment tool for patient stratification at hospital admission can manage the current lack of a proper system. Increasing awareness is crucial to cover the gap between VTE RA and the provision of TP, as both patients and clinicians are often unaware of the morbidity associated to this condition. Increasing awareness among patients about the signs and symptoms and health professionals can efficiently manage the entire process from admission to discharge and keeping detailed records might reduce the occurrence of hospital-acquired VTE.

CONCLUSION

Achieving improvement in VTE RA, appropriate TP prescription and embedding it into practice is difficult but achievable. Majority of studied hospitalized patients were at high risk of developing VTE. Immobility was the commonest risk factor for developing VTE due to old age.

Limitations

Although there was an overall improvement in hospitalised patients risk assessed for VTE. This improvement may be underestimated as the data collection method excluded some areas within the hospital such as cardiac intensive care. All cardiothoracic patients are risk assessed before transfer back to the ward from cardiac intensive care unit and this data was not captured. Although it can be argued that their change in clinical condition requires an updated risk assessment on transfer back to the ward. All patients with a prescription for TP within the audit could infer an informal risk assessment was completed however without documented evidence this cannot be confirmed. Modifiers of possible effect factors were not taken into account such as the number of patients on each ward, the number of staff such as consultants, pharmacists and nurses or other environmental factors which may have had an impact on the results.

Recommendation

It is essential that thromboprophylaxis be implemented in every hospital. There are more efficient thromboprophylaxis techniques,

Competing interests

There are no competing interests.

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Data sharing statement

No additional data are available.

AUTHORS' CONTRIBUTION

AF, NUW: Conceptualization of the study design, write-up. SM, FS: Data collection, data analysis, data interpretation, Proofreading.

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