Quality Improvement Project

OPEN ACCESS
Pak. J. Adv. Med. Med. Res.
2024, 02(2):Page-172-179

Assessment And Enhancement Of Venous Thromboembolism Prophylaxis Protocols In Medical Unit Of Ayub Teaching Tertiary Care Government Hospital, KpK, Pakistan

Ahmad Zeb[1], Hameed Ur Rahman[2], Usman Ali[3], Waleed Asif Khurshid[4], Muhammad Firdous Khan[5] , Muhammad Saad Rasheed[6]

[1,2,3,4,5,6-]Department of Internal Medicine Ayub Teaching Hospital Abbottabad

Abstract

Background: Venous thromboembolism (VTE) refers to the formation of blood clots within the venous system, a serious medical condition with potentially life-threatening consequences. The risk of developing VTE significantly increases during hospitalization due to factors such as reduced mobility and underlying illness. Therefore, it is crucial to perform timely risk assessments and implement appropriate prophylactic measures to prevent the occurrence of this preventable complication in hospitalized patients.

Aim and Objectives: In developing countries, data on VTE prophylaxis remains limited, and in Pakistan, VTE prevention is often overlooked in research and clinical practice. This clinical audit was undertaken to assess current practices in VTE risk assessment and prophylaxis, focusi n g on identifying gaps and evaluating the impact of educational interventions. Enhancing awareness and adherence to standard protocols aims to improve patient care and reduce the risk of preventable complications."

Methodology: Our audit standard used the National Institute for Health and Care Excellence (NICE) guidelines for VTE prophylaxis. In Phase A, conducted from January 20 to February 30, 2024, Data was collected using a customized proforma by prospectively reviewing the medical records of 180 patients admitted to the Medical Unit of Ayub Teaching Hospital. Following an educational intervention t o i m p r o v e adherence to guidelines, Phase B was conducted from March 4 to April 10, 2024, reviewing an additional 150 patients to evaluate any changes in practice.

Intervention: For the intervention phase, findings from Phase A were presented during the monthly ward meeting, attended by the Head of the Department, consultants, registrars, postgraduate residents, interns, and nursing staff of the medical unit. The session focused on educating healthcare providers about the risk factors associated with VTE and the critical need for timely prophylaxis. Additionally, educational posters were strategically displayed throughout the ward to reinforce the importance of adhering to VTE prophylaxis protocols.

Results: In Phase A, of the 180 patients assessed, 27 (15%) underwent risk assessment for VTE. Among those eligible for prophylaxis, only 18 patients (22.2%) received the appropriate prescriptions. Following the educational intervention, Phase B included 150 patients, where significant improvements were observed: all 150 patients (100%) were risk-assessed for VTE, and 112 patients (75%) received the prescribed prophylaxis. This indicates a substantial improvement in adherence to VTE prophylaxis protocols after the intervention.

Conclusion: The audit initially revealed a lack of adherence to standard VTE risk assessment and prophylaxis prescribing practices. However, the implementation of a targeted educational intervention significantly improved compliance, leading to enhanced patient care regarding VTE prevention. This outcome underscores the value of clinical audits as practical tools for improving clinical practices and promoting better patient outcomes.

Keywords: VTE prophylaxis, prevention, hospitalized patients, patient safety and quality improvement, venous thromboembolism, clinical audit process.

How to Cited this Article : **Zeb A, Rahman HU, Ali U, Khurshid WA, Khan MF, Rasheed MS, . Assessment and Enhancement of Venous Thromboembolism Prophylaxis Protocols in the Medical Unit of Ayub Teaching Tertiary Care Government Hospital, KPK, Pakistan: Audit Cycle. Pak J Adv Med Med Res. 2024;2(2):172–179. doi:10.69837/pjammr.v2i02.47.**

Corresponding Author: ; Hameed Ur Rahman2
Department of Internal Medicine Ayub Teaching Hospital Abbottabad

Email: hameedrahman555@gmail.com

https://orcid.org/0009-0004-2259-3596

Cell No +92 348 9049971

Article History

Received:	February	21-2024
Revision:	March	23-2024
Accepted:	April	2 1 -2024
Published:	July	05-2024

INTRODUCTION

Venous thromboembolism (VTE) involves the formation of blood clots in the veins[1,2], manifesting as conditions ranging from deep vein thrombosis, which can be less severe, to potentially fatal pulmonary embolism. Despite its significance, there is currently no published epidemiological data on the incidence of VTE in Pakistan[3,4]. While anyone can be affected by VTE, the risk increases with factors such as reduced mobility, a history of VTE, active cancer, age over 60, recent major surgery or trauma, chronic conditions like COPD or heart disease, those receiving hormonal therapy, family history, and certain inherited conditions[5]. Fortunately, the substantial morbidity and mortality associated with VTE can be minimized through timely interventions[6]. Risk assessment tools like the Padua, Improve, Kucher, and Intermountain scores are available to evaluate the risk in hospitalized patients, allowing for appropriate prophylactic measures, including using low molecular weight heparin, to be implemented. Despite these resources, research indicates that implementing VTE risk assessment and prophylaxis remains suboptimal in developing countries. This oversight compromises patient health and imposes a financial strain on already challenged healthcare systems. To address this issue, we conducted a clinical audit to assess VTE risk assessment and prophylaxis practices within the medical unit and to evaluate adherence to established guidelines.[7]

AUDIT CRITERIA AND STANDARD

This audit compares current practices against the National Institute for Health and Care Excellence (NICE) guidelines for VTE prophylaxis. According to these guidelines, all patients should receive a VTE and bleeding risk assessment at admission, using the clinical risk assessment criteria outlined in the national tool. For this audit, the standard set was that at least 90% of patients should Undergo VTE risk assessment and receive prophylaxis as indicated.

DATA ANALYSIS

Data were analyzed using Microsoft Excel 2023 (Microsoft® Corp., Redmond, WA), and graphs were made using Microsoft Office Word 2023 and Microsoft Excel 2023.

MATERIALS AND METHODS

The closed-loop clinical audit was conducted in two phases at the Medical Unit of Ayub Teaching Tertiary Care Government Hospital, Abbottabad, Pakistan. Phase A took place from July 20 to August 30, 2024. VTE risk assessment was performed using the NICE-approved risk assessment tool, which includes key indications for thromboprophylaxis, such as age over60, obesity (BMI > 30 kg/m^2), history of VTE[8], active cancer, thrombophilia, chronic cardiovascular, respiratory, or endocrine conditions, acute myocardial infarction, ischemic stroke, and expected immobility for more than three days. Contraindications to thromboprophylaxis, as outlined by NICE, include active bleeding, acute hemorrhagic stroke, severe uncontrolled hypertension (BP > 230/120 mmHg), bleeding disorders, and concurrent use of anticoagulants. Data was gathered prospectively by reviewing the medical records of all patients admitted during this phase. Results from each phase were shared at monthly ward meetings attended by doctors, interns, and nursing staff. The Head of the Department approved mandatory documentation of VTE risk assessment and prophylaxis prescriptions. Information posters on VTE prophylaxis were displayed in various ward areas to reinforce this. To close the audit loop, Phase B was conducted from September 4 to October 10, 2024, in the same department. The impact of these measures was evaluated by reassessing VTE risk assessment and prophylaxis practices.

Table 1: Indications for Thromboprophylaxis (as per NICE guidelines)

Indication	Description
Age > 60 years	Older age is a significant risk factor
Obesity (BMI > 30 kg/m²)	Increased body mass index
History of VTE	Prior incidence of venous thromboembolism
Active cancer	Current cancer treatment or metastatic
Thrombophilia	Inherited or acquired blood clot disorder
Chronic cardiovascular disease	Heart failure or chronic heart conditions
Chronic respiratory disease	COPD or other chronic lung conditions
Endocrine conditions	Diabetes or other chronic endocrine issues
Acute MIor ischemic stroke	Recent myocardial infarction or stroke
Reduced mobility (> 3 days)	Due to any illness or injury

Table 2: Contraindications to Thromboprophylaxis (as per NICE guidelines)

Contraindication	Description
Active bleeding	Current bleeding or high risk of bleeding
Acute hemorrhagic stroke	Stroke caused by bleeding in the brain
Severe uncontrolled hypertension	Blood pressure > 230/120 mmHg
Bleeding disorders	Hemophilia, thrombocytopenia, etc.
Concurrent anticoagulant use	Use of warfarin, DOACs, or heparin

RESULTS

Phase A

One hundred eighty patients were included to evaluate current VTE risk assessment and prophylaxis practices. Among these patients, 111 (61.67%) were male, and 69 (38.33%) were female. Regarding age distribution, 63 (35%) were under 50 years,
48 (26.67%) were between 50 and 60 years,
51 (28.33%) were between 60 and 70 years, and 18 (10%) were over 70 years of age. Of the 180 patients, VTE risk assessments were documented in only 27 (15%) cases, indicating a significant gap in adherence to risk assessment protocols. Of these patients,
90 (50%) had an indication for VTE

prophylaxis based on clinical risk factors. However, 9 (10%of those with an indication) had contraindications, primarily due to a high risk of bleeding. This left 81 patients requiring VTE prophylaxis.

However, only 18 (22.22%) eligible patients were prescribed prophylaxis. All patients who received prophylaxis were treated with appropriate doses per standard practices.

Table 3: Patient Demographics and VTE Risk Assessment in Phase A

Category	Number of Patients	Percentage
Total Patients	180	100%
Male	111	61.67%
Female	69	38.33%
Age < 50 years	63	35%
Age 50-60 years	48	26.67%
Age 60-70 years	51	28.33%
Age > 70 years	18	10%
VTE Risk Assessed	27	15%
Indicationfor Prophylaxis	90	50%
Contraindications	9	10% (of those indicated)
Prophylaxis Prescribed	18	22.22%

Table 4: VTE Prophylaxis Eligibility and Prescription in Phase A

Eligibility Status	Number of Patients	Percentage
Indicated for Prophylaxis	90	50%
Eligible (No Contraindications)	81	90% (of those indicated)
Received Prophylaxis	18	22.22%

Phase B

Clinical notes for 150 patients fromthe same medical ward were reviewed in Phase B. This study group comprised 80 (53.3%) females and 70 (46.67%) males. Compared to Phase A, the age distribution of patients in Phase B is illustrated in **Figure 1.**

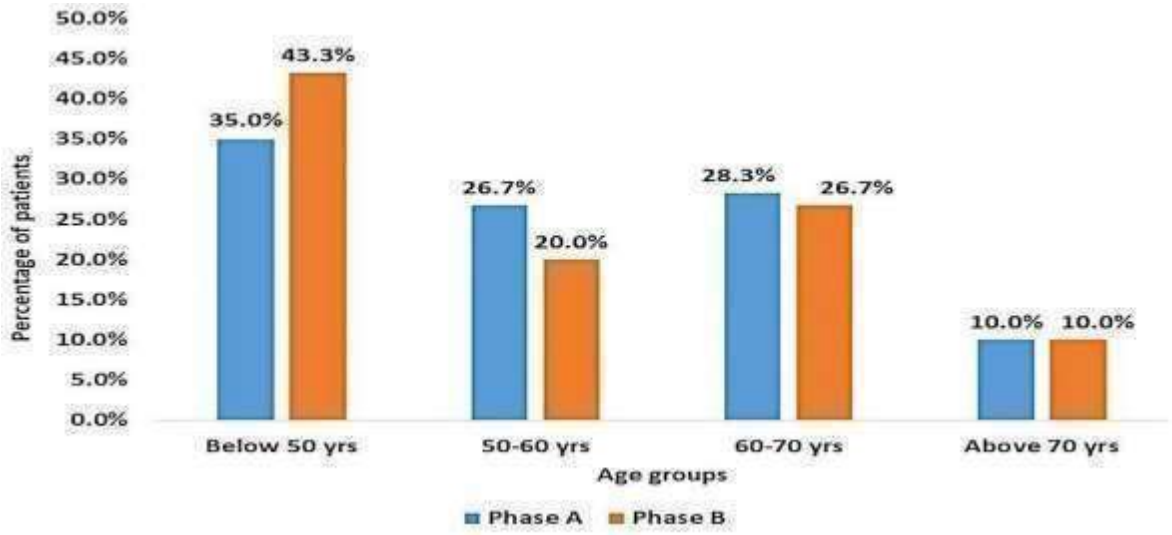

FIGURE 1: Age-wise distribution of patients in Phase A(audit) and Phase B (re-audit)

The evaluation of clinical notes in Phase B revealed that VTE risk assessments were conducted for all 150 patients, achieving a compliance rate of 100%. Among these patients, 40 (26.67%) had clinical indications for VTE prophylaxis. Of these 40 patients, 5 (12.5%) had contraindications precluding prophylaxis. Consequently, 35 (87.50%) indicated patients required VTE prophylaxis. Of those eligible for prophylaxis, 26 (75%) patients received the appropriate prophylactic treatment. Notably, five patients (12.5%) with a clinical indication did not receive prophylaxis despite the absence of any contraindications. All patients prescribed prophylaxis received the appropriate medications and dosages according to standard practices.

Summary of Findings in Phase B

Category	Number of Patients	Percentage
Total Patients	150	100%
Risk Assessments Completed	150	100%
Patients with Indication for Prophylaxis	40	26.67%
Patients with Contraindications	5	12.5%

Category	Number of Patients	Percentage
Patients Requiring Prophylaxis	35	87.50%
Patients Who Received Prophylaxis	26	75%
Patients with Indication but No Prophylaxis	5	12.5%

Figure 2 illustrates the comparison between Phase A and Phase B audits, highlighting the percentage of patients receiving VTE risk assessments and the prescription of prophylaxis. This visual representation emphasizes the positive impact of the educational intervention implemented between the two phases of the audit. The findings indicate a significant improvement in compliance with VTE risk assessment and prophylaxis following the educational intervention, reflecting the effectiveness of the measures to enhance patient care in the medical unit.

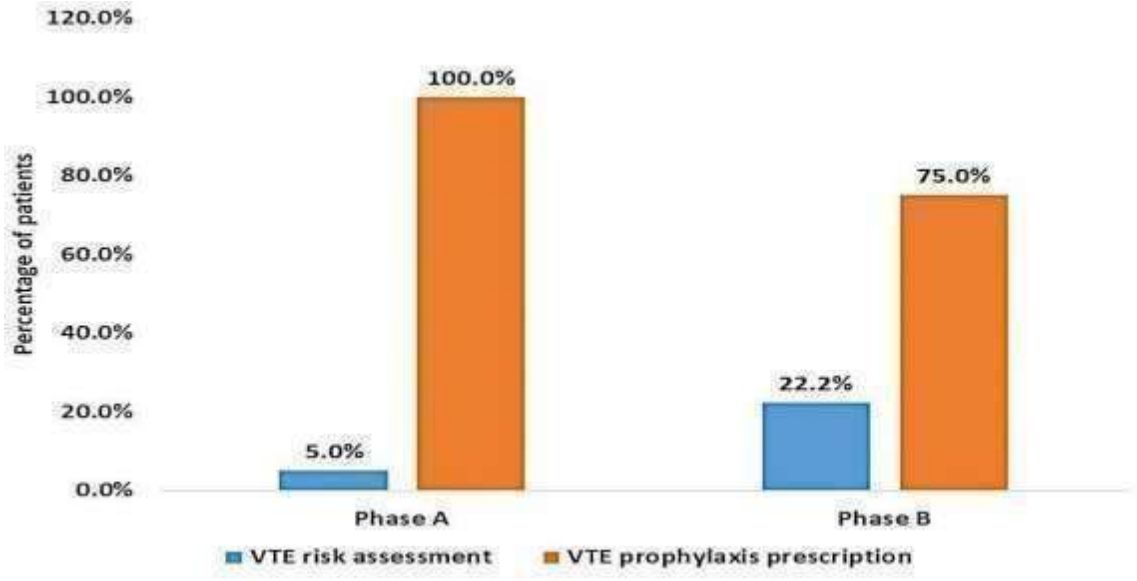

FIGURE 2: Comparison of VTE risk assessment and prophylaxis prescription between Phase A and Phase B

DISCUSSION

Venous thromboembolism (VTE) is a significant concern in hospitalized patients, frequently leading to adverse outcomes, including contributing to over 10% of hospital-related deaths. The global prevalence of hospital-acquired VTE ranges from 0.8% to 11%. Established and well-accepted guidelines exist for the risk assessment and prophylaxis of VTE in hospitalized patients[9]. However, Data evaluating adherence to these standard guidelines in developing countries, including Pakistan, is notably limited. VTE remains a "neglected research agenda" in Pakistan, with no national epidemiological data available regarding its incidence or the implementation of prophylaxis measures[8,9]. This gap may stem from a combination of limited research interest and inadequate resources. This closed- loop clinical audit utilized a specifically designed proforma and revealed critical findings. In Phase A, adherence to VTE prophylaxis standards was alarmingly low, with only 15% of patients undergoing risk assessments for VTE.

Among those eligible for prophylaxis, merely 22.2% received it. These results align with findings from a multicenter study in Nepal, highlighting poor compliance with VTE prophylaxis. When comparing underdeveloped to developed countries, VTE prophylaxis implementation tends to be more robust in the latter. This discrepancy may be attributed to insufficient supervision and overwhelming workloads in low-income nations, compounded by the absence of standardized treatment guidelines and clinical documentation practices due to a lack of electronic medical records. Following the results of Phase A, the medical staff was educated on the importance of VTE risk assessment and prophylaxis. This was facilitated through an educational intervention and mandatory documentation practices. The effectiveness of these initiatives was evaluated in Phase B, which demonstrated significant improvements. In this phase, 100% of patients in the medical ward were assessed for VTE risk, and of those requiring prophylaxis, 75% received it. These results illustrate the vital role that clinical audits play in enhancing the quality of patient care. The notable improvement in VTE risk assessment and prophylaxis following the educational intervention underscores a primary strength of this audit. Additionally, recommendations to the Department of Medicine based on this audit will contribute to further advancements in patient care regarding VTE prophylaxis. However, due to the limited sample size, the findings cannot be generalized. The actual effectiveness of this intervention can be further assessed through a third audit cycle, allowing for a more comprehensive evaluation of its impact on clinical practice.

CONCLUSION

Venous thromboembolism (VTE) is a serious yet preventable condition that significantly endangers patients' lives while imposing additional financial strains on already struggling healthcare systems. The findings from Phase A revealed a lack of adherence to established guidelines; however, implementing a straightforward educational intervention led to substantial improvements in the risk assessment and prophylaxis practices related to VTE. This underscores the critical role of clinical audits in enhancing the quality of clinical practice and patient care[7,9]. By fostering awareness and adherence to best practices, we can mitigate the risks associated with VTE and promote better patient health outcomes.

Ethical Approval Statement

Approval is hereby granted to Ahmad Zeb and his team to conduct data collection at Ayub Teaching Hospital (ATH) for the clinical audit cycle titled: “Assessment and Enhancement of Venous Thromboembolism Prophylaxis Protocols in the Medical Unit of Ayub Teaching Tertiary Care Government Hospital, Khyber Pakhtunkhwa, Pakistan: A Quality Improvement Project. “Throughout the duration of this study, all personal information of the participants was maintained with strict confidentiality.

PAYMENT/SERVICES INFORMATION:

All Authors state that no financial assistance or support was received from any organization about this submitted work. Financial Relationships: All authors confirm that they have no current or prior financial relationship with organizations that may have a vested interest in the submitted work.

ACKNOWLEDGEMENTS

We want to express our heartfelt appreciation to the head of the department, consultants, residents, interns, medical unit staff and management of Ayub Teaching Hospital for their exceptional support and cooperation throughout the data collection and changes implementation process. We also extend our gratitude to the Ethical Review Board (ERB) of Ayub Teaching Hospital for their approval, ensuring adherence to ethical standards. The collaboration and assistance of these individuals and institutions were instrumental in making this audit cycle possible.

Disclaimer: Nil

Conflict of Interest:Nil

FundingDisclosure:Nil

AUTHORS CONTRIBUTION

Concept & Design Of Study; Ahmad Zeb1, Hameed Ur Rahman2, Usman Ali3

Drafting;. , Muhammad Firdous Khan5 , Muhammad Saad Rasheed6

Data Analysis; Usman Ali3, Waleed Asif Khurshid4, Muhammad Saad Rasheed6

Critical Review; Hameed Ur Rahman2, Usman Ali3

Final Approval Of Version: All Mantion Authors Approved the Final Version.

REFERENCE

1. Abdul SA, Anstee C, Villeneuve PJ, Gilbert S, Seely AJE, Sundaresan S, et al. Are sequential compression devices routinely necessary following enhanced recovery after thoracic surgery? Interactive cardiovascular and thoracic surgery. 2022;35(2).

2. Akhtar AB, Mehdi SR, Khan A, Zahid MT, Abu Bakar M. Clinical Practice for Venous Thromboembolism Prophylaxis in Patients Undergoing Oncological Surgeries. Cureus. 2021;13(7):e16627.

3. Albisinni S, Moschini M, Di Trapani E, Soria F, Mari A, Aziz A, et al. Current application of the enhanced recovery after surgery protocol for patients undergoing radical cystectomy: lessons learned from European excellence centers. World journal of urology. 2022;40(6):1317-23.

4. Chakravarthy VB, Yokoi H, Coughlin DJ, Manlapaz MR, Krishnaney AA. Development and implementation of a comprehensive spine surgery enhanced recovery after surgery protocol: the Cleveland Clinic experience. Neurosurgical focus. 2019;46(4):E11.

5. Cho HJ, Lee IK, Lee YS, Yun SS, Park SC, Kim JY, et al. Application of venous thromboembolism prophylaxis program in patients with colorectal cancer using the enhanced recovery after surgery protocol. European journal of surgical oncology : the journal of the European Society of Surgical Oncology and the British Association of Surgical Oncology. 2022;48(6):1384-9.

6. Farey JE, An VVG, Sidhu V, Karunaratne S, Harris IA. Aspirin versus enoxaparin for the initial prevention of venous thromboembolism following elective arthroplasty of the hip or knee: A systematic review and meta-analysis. Orthopaedics & traumatology, surgery & research : OTSR. 2021;107(1):102606.

7. Hill NR, Arden C, Beresford-Hulme L, Camm AJ, Clifton D, Davies DW, et al. Identification of undiagnosed atrial fibrillation patients using a machine learning risk prediction algorithm and diagnostic testing (PULsE-AI): Study protocol for a randomised controlled trial. Contemporary clinical trials. 2020;99:106191.

8. Itou J, Munakata Y, Kuramitsu Y, Madarame H, Okazaki K. Incidence and Distribution of Deep Vein Thrombosis Following Total Hip Arthroplasty Using an Anterolateral Supine Approach. Orthopedic research and reviews. 2023;15:199-205.

9. Parrish RH, 2nd, Bodenstab HM, Carneal D, Cassity RM, Dager WE, Hyland SJ, et al. Positive Patient Postoperative Outcomes with Pharmacotherapy: A Narrative Review including Perioperative-Specialty Pharmacist Interviews. Journal of clinical medicine. 2022;11(19).

10. Poulakou G, Dimakakos E, Kollias A, Kyriakoulis KG, Rapti V, Trontzas I, et al. Beneficial Effects of Intermediate Dosage of Anticoagulation Treatment on the Prognosis of Hospitalized COVID-19 Patients: The ETHRA Study. In vivo (Athens, Greece). 2021;35(1):653-61.

11. Svedman S, Alkner B, Berg HE, Domeij-Arverud E, Jonsson K, Nilsson Helander K, et al. STOP leg clots-Swedish multicentre trial of outpatient prevention of leg clots: study protocol for a randomised controlled trial on the efficacy of intermittent pneumatic compression on venous thromboembolism in lower leg immobilised patients. BMJ open. 2021;11(5):e044103.