2022-03-24

Assessment of Occurrence of VTE, Thromboembolic Prophylaxis Utilization and Associated Factors of VTE in Medical Admitted Patients in Tibebe Ghion Specialized Hospital, Bahir Dar, Ethiopia

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Assessment of Occurrence of VTE, Thromboembolic Prophylaxis Utilization and Associated Factors of VTE in Medical Admitted Patients in Tibebe Ghion Specialized Hospital, Bahir Dar, Ethiopia

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A research thesis Submitted to Internal Medicine Department, School of Medicine, College of Medicine and Health Sciences in Partial Fulfillment of the Requirements for the Specialty Program of Internal Medicine.

December 2020

Ethiopia

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Total Budget	**29279.8Birr**
Study Period	**December 1 to May 31, 2019**
Project Area	**Tibebe Ghion Specialized Hospital, Bahir Dar, Ethiopia**

ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to my advisors Dr. Achenef Motbainor and Dr. Wubet Huneganaw for their continuous comments and feedbacks throughout the preparation and work of the research. My appreciation also goes to Mr. Tamerat Assefa (Assistant professor and clinical pharmacist), Dr. Matias and Dr. Buzayew for helping me in the data collection for the research. I finally extend my gratitude to Tibebe Ghion Specialized Hospital for their willingness to do the research and facilitating the provision of the required data.

ABSTRACT

BACKGROUND: Venous thromboembolism (VTE), which includes deep vein thrombosis (DVT) and pulmonary embolism (PE), is a major cause of mortality and morbidity in hospitalized medical patients. Greater than 25% of all VTE is associated with hospitalization and 50–75% of these cases occur in medical inpatients. The use of pharmacological prophylaxis significantly reduces the incidence of thromboembolic events in high risk patients. Evidence scarce in relation to VTE occurrence and thromboprophylaxis utilization and associated factors in the study area.

OBJECTIVE: To assess occurrence of VTE, Thromboembolic prophylaxis utilization and associated factors of VTE in medical admitted Patients in Tibebe Ghion specialized hospital, Bahir Dar, 2019.

METHODS: An institution based cross sectional study involving patients' chart review was conducted from August 1st to August 15th in patients admitted to medical wards of TGSH from May 1st to December 31st, 2019. All adult patients admitted to the medical wards in the year 2019 were the source population. All patients (≥ 18 years old) who were admitted to adult medical wards of the hospital from May 1st to December 31st, 2019 which meet the study criteria were included in the study. Patients admitted with established VTE and on treatment, those who stayed in the hospital only for 2 days or who were transferred to medical ICU and those with incomplete charts were excluded from the study. The data were collected using data extraction formats prepared by reviewing different literature. Descriptive data were used to display some socio-demographic characteristics. Logistic regression analysis was used to assess the association between dependent and independent variables. Significant association was declared at P-value < 0.05.

RESULTS: A total of 219 patient's charts were reviewed and from these, 51.1% was males 48.9% was females. The mean (±SD) age of the participants was 46.40 (± 18.64) with a range of 18-86 years. The maximum hospital stay was 57 days with a mean of 9.5 days.

Major reasons for hospital admission were due to congestive heart failure (26.9%), anemia (20.5%) and stroke (15.5%). There were some commonly found VTE risk factors such as reduced mobility, recent trauma or surgery, Heart and/or respiratory failure, and active cancer were VTE risk factors which frequently identified in study population. Based on Padua RAM, 48.4 % of study participants were at high risk of developing VTE (≥4 Padua risk score) and a 51.6% were in the lower risk category. Total risk scores were 20 and the minimum and maximum scores were 1 and 8, respectively with a mean score of 2.2. In this study, 15 (6.84%) patients

developed VTE events during their stay at hospital and almost 80% of them were from high VTE risk groups and 3 patients developed VTE from low risk groups. VTE prophylaxis was given only for 55 (25.1%) patients and 15 of them were from low risk stratum even if they are ineligible for thromboprophylaxis. Reduced mobility AOR = 9.99 (95%CI (1.701-58.702), age ≥ 60 years old AOR = 17.78 (95%CI (2.876-109.953), female AOR = 14.508 (95%CI (2.524-83.391), recent(<1month) trauma and/or surgery AOR=18.93 (95%CI (2.303-155.560).

CONCLUSION: The levels of provision for pharmacological VTE prophylaxis in hospitalized medical patients who meet the pre-defined risk assessment score is very low so there is room for the implementation of strategies to increase the use of VTE prophylaxis.

KEYWORDS: VTE, Prophylaxis, Inpatients, Medical Ward

LISTS OF ACRONYMS

ACCP	American College of Chest Physician
CKD	Chronic Kidney Diseases
DVT	Deep Venous Thrombosis
LMWH	Low Molecular Weight Heparin
PAD	Peripheral Arterial Diseases
PE	Pulmonary Embolism
TASH	Tikur Anbesa Specialized Hospital
TGSH	Tibebe Ghion Specialized Hospital
UFH	Unfractionated Heparin
VTE	Venous Thromboembolism

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1.INTRODUCTION

1.1**BACKGROUND OF THE STUDY**

Venous thromboembolism (VTE), which includes deep vein thrombosis (DVT) and pulmonary embolism (PE), is a major cause of mortality and morbidity in hospitalized medical patients. Greater than 25% of all VTE is associated with hospitalization and 50–75% of these cases occur in medical inpatients [1, 2].

VTE remains a significant cause of morbidity and mortality in United States and European population, with hospitalization for medical illness accounting for almost one-quarter of the incident VTE events occurring in the community. The mortality due to pulmonary embolism (PE) is thought to be particularly high among hospitalized medical patients. Global audits have shown underutilization of thromboprophylaxis by clinicians in hospitalized at-risk medical patients, mainly due to the perceived higher risk of bleeding or lower risk of VTE than that reported in the clinical trials. An increased DVT rate was reported in a significant percentage of medical patients in the absence of prophylaxis [3, 4].

Fortunately, both DVT and PE are preventable in hospitalized medical patients with acute illness by routine thromboprophylaxis. As reported by Western countries, VTE is now a well-established major concern among in-patients in sub-Saharan Africa [5].

There are 2 types of DVT prevention methods for patients who are at risk of developing it. The first is non pharmacologic prophylaxis like the use of compression stockings, leg elevation, sequential compression devices(SCDs), ambulation, and vena cava filter and the second is “pharmacologic,” which is through the use of blood-thinning medications. The most common blood thinner used as DVT prophylaxis in Ethiopia is unfractionated heparin(UFH). The other well-known blood thinner, Warfarin, is not used as primary prevention of VTE in patients who had no previous VTE; rather its use is established in the prevention of recurrent VTE in patients who already had it [4].

1.2. STATEMENT OF THE PROBLEM

VTE most often accompanies serious illness and rarely develops in healthy, active people. A retrospective review of medical records in Olmsted County, MN, between 1980 and 1990 demonstrated a strong association between hospitalization and the development of deep venous thrombosis. The average annual incidence of inpatient VTE, adjusted for age and sex, was 960.5 per 10,000 person-years, compared with 7.1 per 10,000 person-years in patients in the community [6].

VTE is a major clinical concern with a substantial risk of morbidity and mortality in patients hospitalized for acute medical and surgical illnesses. A hospital-based countrywide study in Senegal shows that large proportions of medical and surgical patients are at risk of VTE but that the recommended VTE prophylaxis is not prescribed in the majority of cases. [7]

Prevention of DVT thereby decreases the incidence of PE, a serious and life-threatening condition. DVT is a major preventable cause of mortality and morbidity worldwide. DVT and PE account for 60,000 to 100,000 deaths annually in the United States. Hospitalized patients are at risk of venous stasis and with the presence of other factors, they are at increased risk of DVT when compared to patients in the community. [8]

Large prospective studies continue to demonstrate that these preventive methods are significantly underutilized; often with only 30% to 50% eligible patients were receiving prophylaxis [2]. Recent studies have indicated that pharmacological prophylaxis is underutilized in medical inpatients. Although most hospitalized medical patients have an indication for VTE prophylaxis, data from North American and international studies have shown that less than one third receive adequate VTE prophylaxis in hospital [1]
The lack of implementation of evidence-based guidelines for VTE prophylaxis in at-risk medical patients may be based on confusion regarding the assessment of VTE risk, a lack of awareness of VTE risk, or a strong fear of major bleeding. [9]

In addition to the adverse patient outcomes of VTE, it also represents a significant financial burden on the health budget. An inpatient VTE incident study analyzing 2147 patients found that the median cost of VTE events were US$3131 per DVT, US$6424 per PE and US$6678 per DVT+PE event [10]

There are three periods of VTE risk in hospitalized medically ill patients that are helpful to conceptualize from a perspective of both VTE risk as well as the utility of a thromboprophylactic strategy: [3]
The acute hospitalization period (~ 6–14 days) – this likely represents a VTE risk period that is tied to a patient's immobility and disease severity, usually from an acute on chronic medical illness exacerbation [3].The post-hospital discharge period (up to 45 days) – this likely represents a high VTE risk period and is related to both disease-specific exacerbation of a patient's underlying illness as well as patient-specific VTE risk factors. Although the period of VTE risk may extend up to 90 days' post-discharge, the majority (~80 %) of VTE events occur in the first 45 days after hospital discharge [3]. Fortunately, both DVT and PE are preventable in hospitalized medical patients with acute illness by routine thromboprophylaxis. As reported by Western countries, VTE is now a well-established major concern among in-patients in sub-Saharan Africa [1]
The rationale for providing thromboprophylaxis is that prevention is clinically beneficial compared with treatment of a thromboembolic event once it has occurred [2]
DVT prophylaxis can be primary or secondary. Primary prophylaxis is the preferred method with the use of medications and mechanical methods to prevent DVT. Secondary prophylaxis is a less commonly used method that includes early detection with screening methods and the treatment of subclinical DVT. The most common blood thinner used as DVT prophylaxis in Ethiopia is unfractionated heparin (UFH). The other well-known blood thinner, Warfarin, is not used as primary prevention of VTE in patients who had no previous VTE; rather its use is established in the prevention of recurrent VTE in patients who already had It [8]

1.3. SIGNIFICANCE OF THE STUDY

This study is designed to disclose the utilization of VTE prophylaxis, risk factors for VTE and outcome in hospitalized medical patients. This will help to inform healthcare professionals, leadership of the health system, program managers and policymakers to know the status and consider establishing national guidelines and allocate budget. For healthcare professionals to evaluate hospitalized medical patients for having indication for VTE prophylaxis and appropriate intervention to improve the quality of care and resource. The finding of this research will also be used as baseline data for other researchers interested in the area.

2.LITERATURE REVIEW

2.1. STATUS OF PROPHYLAXIS UTILIZATION

A retrospective study conducted in two departments of Internal Medicine at the hospitals of Varese and Angera, Italy. The paper tried to assess the prevalence of clinical conditions requiring VTE prophylaxis and to evaluate the adherence to published clinical guidelines, patients were selected on the basis of the ACCP consensus statements. Clinical indications for VTE prophylaxis were identified in 165 of 516 patients (32%), with a mean age of 74.5 years. The results of this retrospective chart review demonstrate that VTE prophylaxis in medical patients is still significantly underused, despite compelling evidence for its efficacy. According to the current recommendations of the Sixth Consensus Conference of the ACCP, at least one-third of their patients presented with clinical conditions at moderate or high risk of VTE. Only 31.5% of them received adequate prophylaxis, 46.4% after the exclusion of patients with clinical contraindications and patients who were on oral anticoagulants prior to hospital admission. [11]

The multicenter Canadian CURVE study showed the Canada-wide VTE prophylaxis rate to be 16%. A multicenter US study has shown the appropriate VTE rate as only 33.9%. The Epidemiologic International Day for the Evaluation of Patients at Risk for Venous thromboembolism in the Acute Hospital Care Setting (ENDORSE) study showed the VTE prophylaxis rate to be only 39% [1]

The use of VTE prophylaxis was higher in patients with acute ischemic stroke and heart failure than it was in patients with malignancies, acute infectious diseases or acute respiratory failure. However, the use of prophylaxis was still inadequate in all groups of patients, irrespective of their risk profile. [11] A study done in TASH, only 37.5% of patients received thromboprophylaxis. [2]

2.2. BURDEN OF THE DISEASES

In a prospective observational study of 1,180 medical inpatients, 60.3% of patients were low risk and 39.7% were high risk. Among patients who did not receive prophylaxis, VTE occurred in 11.0% of high-risk patient's vs 0.3% of low-risk patients (HR, 32.0; 95% CI, 4.1-251.0). Among high-risk patients, the risk of DVT was 6.7%, nonfatal PE 3.9%, and fatal PE 0.4%.9 HR 5 hazard ratio. [12]

UFH, LMWH and mechanical devices like an elastic stocking or Thromboembolic prophylaxis in medical patients Intermittent Pneumatic Compression (IPC) are the available options. More recently, new agents like penta saccharides have also been introduced for this indication too. Though there are no enough good data to discuss the use of different mechanical modalities in hospitalized medical patients, several studies including a Cochrane review, showed that the use of graduated compression stocking reduced VTE in hospitalized patients after surgery by about 50% [13] The findings of the MEDENOX study indicate that the increased risk of VTE persists for up to 3 months after the initial presentation, suggesting that extended-duration thromboprophylaxis may be beneficial. [14] According to the study done in TASH 11 (5.5%) patients developed VTE events during their stay at the hospital and nearly two-thirds of them were from those at highest VTE risk and it occurred in patients who stayed hospital more than 15 days. In the remaining participants 61 (30.5%) didn't develop VTE during their hospital stay. [2]

2.3. FACTORS THAT AFFECT VTE PROPHYLAXIS

Not giving pharmacologic thromboprophylaxis for patients who deserve it because of significant risk will impact patient safety and will increase the occurrence of DVT which will, in turn, increase healthcare costs. One of the reason for not giving thromboprophylaxis in patients with high risk of DVT is forgetting to consider the risk of DVT for every patient as most of the patients had multiple diagnosis and emphasis is given for the patients' chief complaint and major diagnosis [15] A survey in Togo has found that only 16% of anesthetists and surgeons considered that VTE was as common in their country as in western countries [16] There is an urgent need for awareness and training of physicians regarding the burden of VTE. In the context of low-income countries without social security or insurance coverage, the cost of drugs may have impacted negatively on the prescription of VTE prophylaxis and patients' adherence to treatment. [7]

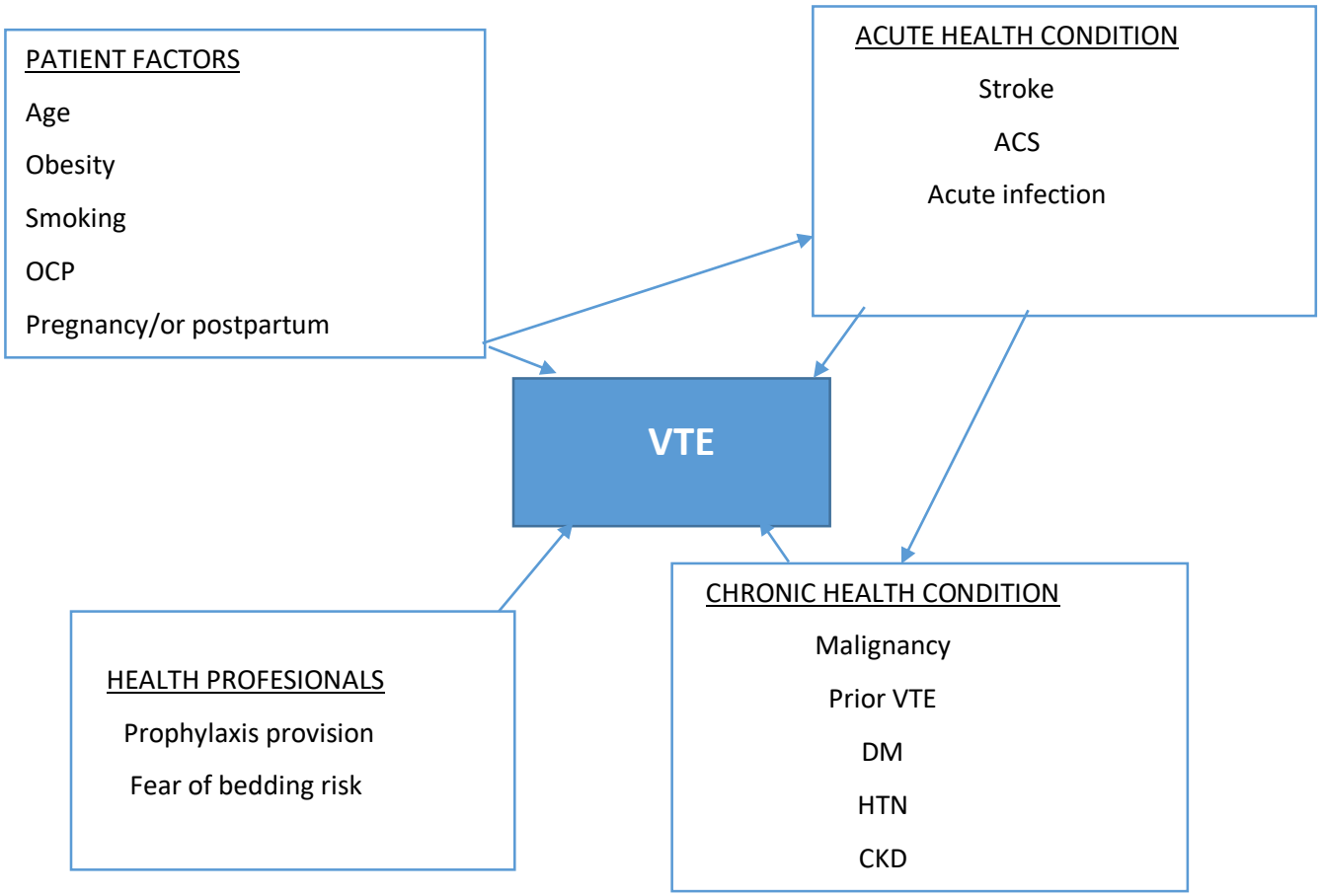
2.4. IMPACT OF VTE PROPHYLAXIS ON SOCIOECONOMIC AND QUALITY OF LIFE

Because VTE recurs frequently, especially within the first 6–12 months after the initial VTE event, it is important to understand the economic burden of VTE beyond initial hospitalization. Previous studies have shown that costs for the treatment of a recurrent VTE event are higher than those for treatment of a first VTE event. [17]

Recurrent VTE had significantly worse disease severity and poorer quality of life than patients without prior VTE, indicating that burden-of-illness is more severe in such patients. As VTE is a common cardiovascular condition and the post-thrombotic syndrome is a frequent chronic complication of VTE. [18]

CONCEPTUAL FRAMEWORK

Figure 1 conceptual frame work



3.OBJECTIVES OF THE STUDY

3.1. GENERAL OBJECTIVE

The general objective of the study is to assess occurrence of VTE, use of thromboembolic prophylaxis and associated factors of VTE in hospitalized medical patients from May 1st, 2019 to December 31, 2019 in Tibebe Ghion Specialized Hospital, Bahir Dar, 2020.

3.2. SPECIFIC OBJECTIVES

- To assess VTE occurrence in hospitalized medical patients
- To assess use of VTE prophylaxis
- To identify factors associated with VTE

4.METHODS AND MATERIALS

4.1. STUDY DESIGN AND PERIOD

A retrospective cross sectional study involving patients' chart review was conducted from August 1ST to August 15 in patients admitted to medical wards of TGSH from December 1st to may 30th, 2019 G.C. All adult patients admitted to the medical wards in the year 2019 were the source population. Medical patients who were admitted in the hospital in the year 2019 from December 1st to may 30th, 2019 G.C. were the study population

4.2. STUDY AREA

Tibebe Ghion specialized hospital is located about 10km south from the city center and about 7 km from the new bus station ('Addis Meneharia') on the way to Adet District and about 23 km from the Blue Nile Falls (locally called 'Tis Esat' (Smoke of Fire). It is a tertiary university teaching hospital with 499 bed capacity out of which 72 are occupied by medical adult patients. The hospital receives patients who are referred from across the Amhara region and gives outpatient and inpatient services in all major departments.

4.3. SOURCE POPULATION

All adult patients admitted to the medical ward of Tibebe Ghion Specialized Hospital in the year 2019 were the source population.

4.4. STUDY POPULATION

Medical patients who were admitted to the hospital in the year 2019 from December 1st to may 30th, 2019 G.C. were the study population.

4.5. INCLUSION CRITERIA

- Age ≥ 18-year-old
- Hospitalized for >48hrs
- Complete documentation (having clear admission and discharge date)

4.6. EXCLUSION CRITERIA

- Age <18
- Hospitalized for <48 hrs.
- Those admitted with established DVT
- On VTE treatment

4.7. STUDY VARIABLES

Dependent Variables

- VTE occurrence

Independent Variable

- Age
- sex
- Duration of hospital stay
- Pregnancy and /postpartum
- Acute infection
- Surgery and /trauma
- HIV infection
- Malignancy
- CKD
- Total VTE risk score

4.8. SAMPLING SIZE ESTIMATION

The sample size was determined by using the following assumptions; proportion of VTE prophylaxis utilization 0.4, from previous study. [2], 95% confidence level (1.96), level of precision 0.5%. Using Epi info version 7 and based on the above assumptions the estimated sample size become 267 patients by adding the 10% none response rate the sample size was found to be 294. The sample size for the second objective was determined by using double population formula by using epi info version 7 by considering assumption of 95% confidence interval, power 80% and ratio 1:1., OR from previous study 6.553 [2] the estimated sample size become 323.

Table 1.sample size calculation using epi info

Variables	CI	AOR	Ratio (unexposed /exposed)	Power	% of outcome In un exposed	% of outcome in exposed	Sample size	Add 10% of NRR
Age	95%	6.553	1:1	80%	3.68	13.5	294	323
AMI	95%	83.24	1:1	80%	90	1.05	192	211
Lung disease including pneumonia	95%	9.549	1:1	80%	1.63	11.53	234	257

Therefore, the sample size calculated by using the second objective was larger than the sample size calculated for single population proportion. so, that the final sample size of the study was found to be 323.Accordingly, 323 patients' charts were included for retrospective review by systematic random sampling method. Finally, I have reviewed 219 patients' charts as many charts were excluded as they fall in exclusion criteria.

4.9. DATA COLLECTION, MANAGEMENT, QUALITY ASSURANCE AND ANALYSIS

A structured instrument for data collection which was developed from different literature and guidelines was used to collect all necessary data from patients' charts. The instrument was specifically designed to capture sociodemographic (age, sex), VTE risk assessment, contraindication, thromboprophylaxis and VTE related patient outcome. The VTE risk assessment tool was taken from Padua risk assessment model. Patients' data was collected from their admission to discharge dates. VTE events were identified as recorded by attending physician on medical charts of patients. The data was collected by two interns and the principal investigator after training was given for 1 day on how to collect the required information from patients' charts. Pre-test was done on 5% of the study population before going to the actual data collection for checking its clarity, simplicity, understandability and necessary modification were made to the data collection tool. Data was checked for its completeness. Then it was entered and analyzed using IBM SPSS version 26. Descriptive statistics were used to summarize the data.

5. OPERATIONAL DEFINITIONS

Padua risk assessment model(RAM)-is the widely used tool to stratify patients at a different level of VTE risks based on the risk factors that exist (risk assessment points) in hospitalized medical patients. The Padua prediction score, indicating a high risk, was defined as a score of 4 or higher and 3 or less is categorized as low risk.

High bleeding risk –Patients admitted with the following clinical conditions are said to have high risk of bleeding, active gastroduodenal ulcer, bleeding in 3 months before admission platelet count less than 50000, followed by age 85 years, hepatic failure, severe renal failure, and ICU or critical care unit admission.

Reduced mobility- a major risk factor and defined as Patient confined to bed > 72 hrs. with toilet privilege

6.ETHICAL CONSIDERATIONS

Ethical clearance was taken from Ethical Review Committee of Bahir Dar University, College of Medicine and Health Sciences and permission to access patient charts was obtained from the hospital clinical service director and internal medicine department. For the purpose of confidentiality, patients' names were not used at the time of data collection; instead a specific identification number was given for each patient. All other personal and health information were de-identified and kept separately, so every effort was made to maintain confidentiality throughout the study period and afterwards. Besides, information obtained in the course of study was only handled by the research team, and data are analyzed in aggregate.

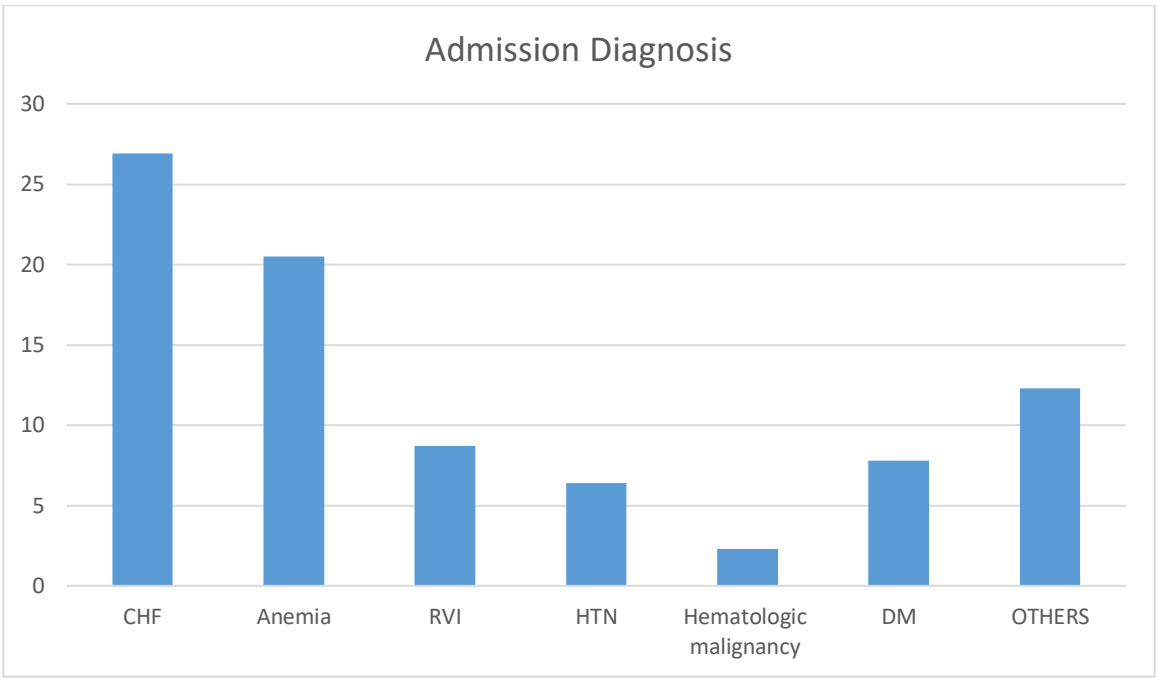
7.RESULTS

Sociodemographic and Clinical Characteristics

Out of 219 patients, almost equal numbers of males (51.1%) and females (48.9%) participated in this study. The mean (±SD) age of the participants was 46.40 (± 18.64) and an age range of 18-86 years. The maximum hospital stay was 57 days with a mean of 9.5 days. Major reasons for hospital admission were due to congestive heart failure (59,26.9%), anemia (45,20.5%) and stroke (34,15.5%) other reasons are depicted on the table (Table 2)

Table 2. Sociodemographic and Clinical Characteristics of Patients Admitted to medical Wards of TGSH

Sociodemographic profile		N(%)
Sex	Male	112(51.1)
	Female	107(48.9)
Age (in Years)	18-39	87(39.7)
	40-59	68(31.1)
	60-74	38(17.4)
	>=75	26(11.9)
Duration of hospital stay	<= 7	123(56.2)
(in days)	8-15	66(30.1)
	16-30	20(9.1)
	31-90	5(2.3)
	>=91	4(1.8)
Reason for admission to hospital	Congestive heart failure	59(26.9)
	Anemia	45(20.5)
	Retroviral infection	19(8.7)
	Hypertension	14(6.4)
	Hematologic malignancy	5(2.3)
	Diabetes mellitus	17(7.8)
	Others	27(12.3)



Others (CKD, AKI and Respiratory infections)

Figure 2. percentage of admission diagnosis

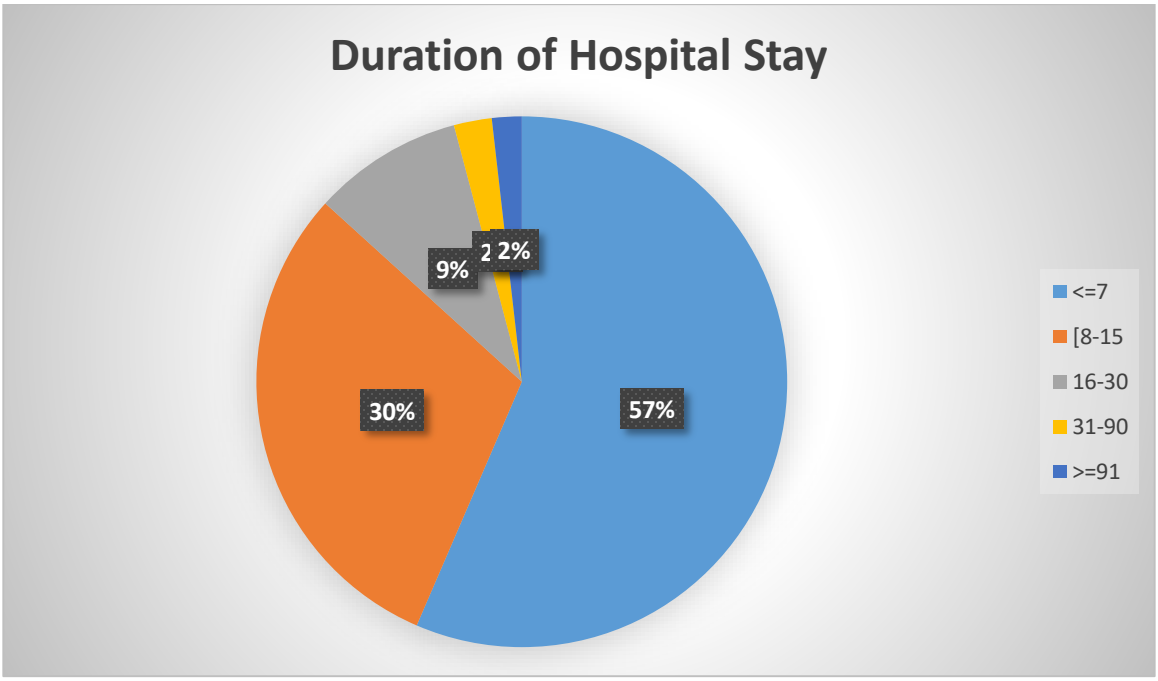


Figure 3 percentage of duration of hospital stay

VTE RISK STRATIFICATION AND THROMBOPROPHYLAXIS STATUS

Based on Padua RAM, 48.4 % of study participants were at high risk of developing VTE (>=4 Padua risk score) and a 51.6% were in the lower risk category. Total risk scores were 20 and the maximum and minimum scores were 8 and 1, respectively with a mean score of 2.2. There were some commonly found VTE risk factors such as reduced mobility, recent trauma or surgery, Heart and/or respiratory failure, and active cancer were VTE risk factors which frequently identified in study population (Table 3).

Table 3. VTE related risk factors

Risk factors	frequency	Percent
Acute infection/and rheumatologic disorder	168	76.7
Heart and/or respiratory failure	47	21.5
Reduced mobility	90	41.1
Elderly age>=70	30	13.7
Active cancer	23	10.5
Previous VTE(excluding superficial venous thrombosis	3	1.4
Already known thrombophilia condition	0	0
recent(<1month)trauma and/or surgery	10	4.6
Acute MI or ischemic stroke	28	12.8
ongoing hormonal treatment	0	0
obesity (BMI>=30)	-	-

VTE prophylaxis was given only for 55 (25.1%) patients and 15 of them were from low risk stratum even if they are ineligible for thromboprophylaxis. In the remaining study participants 98(44.74 %)were having low risk scores and 66(30.13) who were in high risk stratification, for a total of 164 patients thromboprophylaxis were not prescribed. Heparin 7500 IU SC BID/day was the most widely used prophylaxis regimen in the studied population BID/day was the most widely used prophylaxis regimen in the studied population (Table 5).

Table 4. VTE risk stratification

Total Risk Score	Risk stratification	N(%)	Prophylaxis not provided	VTE prophylaxis provided	VTE developed
0-3	Low risk	113(51.6)	98	15	3
>=4	High risk	106(48.4)	66	40	12

Table 5. Thrombopropylaxisis regimen used

Thromboprophylaxis Used	N (%)
Unfractionated heparin 5000IU SC BID	0
Unfractionated heparin 5000IU SC TID	1 (0.4)
Unfractionated heparin 7500IU SCBID	46 (21)
Enoxaparin 40 mg SC daily	0
ASA 81mg po daily	8 (3.7)
No prophylaxis given	164 (74.9)

THROMBOPROPHYLAXIS APPROPRIATENESS AND VTE OUTCOMES

In my study, 15 (6.84%) patients developed VTE events during their stay at hospital and almost 80% of them were from high VTE risk groups and 3 patients developed VTE from low risk groups (Table 4) and it was occurred in patients who stayed hospital more than or equal to 7 days. All of them, who developed VTE, did not receive thromboprophylaxis and All of them received treatment regimen for VTE. In the remaining participants 66 (30.1%) the status of VTE not known since it wasn't documented in patients' chart.

Thromboprophylaxis was given inappropriately for 15 patients despite the fact that they did not fulfill the criteria for prophylaxis, (i.e., they were at low risk of developing VTE) (Table 4).

Moreover, four patients with absolute contraindications received prophylaxis without considering the harm. About 8 patients received ASA 81 mg daily for VTE prophylaxis and only one patient received UFH 5000 IU SC TID (Table 5).

CONTRAINDICATIONS TO PHARMACOLOGICAL PROPHYLAXIS

In this study, 18(8.21%) patients had one or more absolute contraindication(s) to thromboprophylaxis.

Table 6. Contraindication to Thromboprophylaxis of Patients Admitted to medical Wards of TGSH (N=219)

Contraindication	N(%)
Risk of bleeding	11(5%)
GI bleed with in the last 03 months	3(1.4)
Significant thrombocytopenia<50000	2(0.9)
Heparin sensitivity or HIT	0
Severe PAD	2(0.9)
Skin ulceration	0

FACTORS ASSOCIATED WITH DEVELOPMENT OF VTE DEVELOPMENT STUDIED PARTICIPANTS

On Univariate logistic regression for independent variables of interest namely age, sex, reduced mobility, recent(<1month) trauma and/or surgery, active cancer, Chronic kidney diseases and Hypertension were associated with the occurrence of VTE.All variables with p value ≤ 0.25 in bivariate analysis were taken to multivariable model to control for all possible confounders.

Multivariate logistic regression depicted seven variables were associated with the occurrence VTE in my study. For example, the odds of female to develop VTE was 14.51 higher (95%CI (2.524-83.391) than males. Furthermore, being ≥ 60 years old AOR= 17.782 (95%CI (2.876-109.953) exposes patients to develop VTE 17.782 times than those less than 60 years old. Study participants who had reduced mobility AOR=9.992 (95%CI (1.701-58.702), recent(<1month) trauma and/or surgery AOR=18.928 (95%CI (2.303-155.560), active cancer AOR=5.999(95%CI (1.050-34.275) Chronic kidney diseases AOR= 61.790 (95%CI (2.627-1453.602) and hypertension AOR=7.270 (95%CI (1.105-47.835) were independent predictors for VTE incidents in this study (Table 7).

Table 7. Associated with VTE Development

Variables	Category	COR,95%CI	AOR, 95% CI	p-value
Sex	Female	4.589(1.257-16.751)	14.508(2.524-	.003
	Male	1.00		
Age in years	>=60	9.6(2.615-35.243)	17.782(2.876-109.953)	.002
	<60	1.00		
Reduced mobility	Yes	6.462(1.768-23.621)	9.992(1.701-58.702)	.011
	No	1.00		
Recent(<1month)trauma and/or surgery	Yes	7.036(1.613-30.683)	18.928(2.303-155.560)	.006
	No	1.00		
Chronic kidney diseases	Yes	7.692(1.287-45.966)	61.790(2.627-1453.602)	.010
	No	1.00		
Active Cancer	Yes	3.541(1.027-12.21)	5.999(1.050-34.275)	.044
	No	1.00		
Admission Diagnosis HTN	Yes	3.935(1.236-12.525)	7.270(1.105-47.835)	.039
	No	1.00		

COR: Crude Odds ratio; AOR: Adjusted Odds Ratio; CI: Confidence Interval.

8.DISCUSSION

Venous thromboembolism (VTE) is a serious and potentially fatal condition with an annual incidence of 100 persons per 100,000 in the United States12 and 1.83 per thousand per year in UK.DVT is third most common cardiovascular disease after ACS and stroke and VTE is responsible for 5 - 10% of all hospital deaths[19].In my study, the most common risk factors found for VTE development were Acute infection/and rheumatologic disorder(76.7%) ,reduced mobility (41.1%),having heart and /or respiratory failure (21.5%), elderly age >=70 years (13.7%), Active cancer (10.5%) and acute MI or Ischemic stroke (12.8%). A similar study conducted in Tikur Anbesa specialized hospital reported acute infection, heart failure and active cancer was identified the most common risk factors for occurrence of VTE [5]. A similar study done in university of Gondar referral hospital, depicted acute infection (51.5%) heart or respiratory failure (25.7%), and reduced mobility (21.4%) were found to be the common risk factors for thromboembolism [4]. Another study done in one of a public sector medical college in Pakistan [19] described reduced mobility (54.7%, $p < 0.005$) and advancing age (41.17%, $p < 0.005$) was found to be the most common risk factor for VTE development. From the study population 48.4% are at high risk of developing VTE which is much less than the study done at TASH, which is 93%. [20]

Nearly half (48.4%)of admitted patients have high risk of venous thrombosis that requires thrmboprophylaxis administration. Closer to the current study, a study done in university of Gondar referral hospital reported 47.6% of patients had significant risk of DVT, that requires prophylaxis [4]. similarly, S. Barbar et al. [20] described 39.7% were labeled as having a high risk of VTE, which is comparable with my study.

In my study, thromboprophylaxis was given to only 55(25.1%) of patient and 15(6.84%) of them received it without having risk and among this, about 8 patients received ASA 81 mg daily for VTE prophylaxis and one patient received UFH 5000 IU SC TID and 4 patients given pharmacologic prophylaxis despite having absolute contraindication. Similarly, a study done in Saudi Arabia showed 39.3% obtained prophylaxis and for 25.6% of patient's prophylaxis was prescribed with no risk [21].

Underutilization of prophylaxis was shown in several studies including the ENDORSE study (a multinational cross-sectional survey) reported 39.5% [22] and a multicenter study in Canada also reported thromboprophylaxis was indicated in 90% study patients. Overall, some form of prophylaxis was administered to 23% of all patients. However, only 16% received appropriate thromboprophylaxis [23].

In the present study, the incidence of VTE event was 6.84% which is significantly higher than the reports of other various studies conducted elsewhere like Mahlab-Guri et al. reported only 6 of their 2417 study patients (0.24%) were diagnosed with DVT/PE within 3 months of their admission (4 during hospitalization and 2 thereafter within 3 months) [2]and in TASH the incident was found to be 5.5% [24]

In my study reduced mobility, recent trauma (<1month) and/or surgery, active cancer, being female, chronic kidney diseases and hypertension were found to be independent predictors of VTE development in the study. 66(30.13%) who were in high risk stratification, the status of VTE outcome and VTE prophylaxis administration (despite having high risk on the RAM) were not documented.

9.LIMITATION OF THE STUDY

Since I have used secondary data which is not as reliable as primary data, some of the necessary information used for this study were not found on patient's registration (like BMI). In addition, most of patient charts were incomplete and poor documentation of patient's data by physicians on the chart. Risk association for those variables which were not documented was difficult to analyze and several factors which are not included in this study could affect prophylaxis utilization and outcome. It was difficult to assess other non-pharmacologic alternatives like on the importance leg elevation and early ambulation, since it was not documented on patient charts.

10.CONCLUSION

In my study, all patients are having at least one risk factor for VTE. only 55(25.1%) of patient received VTE prophylaxis, of these 15(6.84%) of them received it without having risk and about 8 patients received ASA 81 mg daily for VTE prophylaxis and one patient received UFH 5000 IU SC TID and 4 patients given pharmacologic prophylaxis despite having absolute contraindication. The levels of provision for pharmacological VTE prophylaxis in hospitalized medical patients who meet the pre-defined risk assessment score is very low so there is room for the implementation of strategies to increase the use of VTE prophylaxis.

11.RECOMMENDATION

Taking in to account the importance of utilization of VTE prophylaxis in medical admitted patients a validated risk assessment model (like the Padua or Caprini RAM) should be attached to the charts of every admitted medical patient, this will able help to identify risks and to decide on VTE prophylaxis.

The hospital should prepare VTE prophylaxis and treatment guideline. Especially, Internal medicine department can take the lion share on the preparation. The hospital should also improve chart keeping and if possible better to consider changing to electronic health technology.

Physicians should improve their documentation on patient charts and should apply existing evidence based on ACCP's proposed guideline for the prevention and treatment of VTE.

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