

2022-03-24

OUTCOMES AND CLINICAL CHARACTERISTICS OF VENOUS-THROMBOEMBOLISM AMONG ADULT VENOUS THROMBOEMBOLISM MEDICAL PATIENTS AT TIBEBE GHION SPECIALIZED HOSPITAL AND FELEGE HIWOT REFERRAL HOSPITAL BAHIR DAR, ETHIOPIA.

BISRAT, GINFRE

<http://ir.bdu.edu.et/handle/123456789/13276>

Downloaded from DSpace Repository, DSpace Institution's institutional repository



**BAHIR DAR UNIVERSITY
COLLEGE OF MEDICINE AND HEALTH SCIENCE
SCHOOL OF MEDICINE
DEPARTMENT OF INTERNAL MEDICINE**

**OUTCOMES AND CLINICAL CHARACTERISTICS OF VENOUS-
THROMBOEMBOLISM AMONG ADULT VENOUS
THROMBOEMBOLISM MEDICAL PATIENTS AT TIBEBE GHION
SPECIALIZED HOSPITAL AND FELEGE HIWOT REFERRAL
HOSPITAL BAHIR DAR, ETHIOPIA.**

BISRAT GINFRE (MD, MEDICAL RESIDENT)

**A RESEARCH PAPER SUBMITTED TO DEPARTMENT OF INTERNAL
MEDICINE, SCHOOL OF MEDICINE, COLLEGE OF MEDICINE AND
HEALTH SCIENCES, BAHIRDAR UNIVERSITY FOR PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE SPECIALTY
PROGRAM OF INTERNAL MEDICINE.**

**NOVEMBER 2021
BAHIR DAR -ETHIOPIA**

**Bahir Dar University, College of Medicine and Health Sciences, School of Medicine,
Department of Internal Medicine research thesis submission form**

Principal Investigator	<p><i>Bisrat Ginfre</i> (MD, Year III Medical resident) Department of internal medicine College of medicine and health science Bahir Dar University Email-bisratgenfrie@gmail.com</p>
Advisors	<p><i>Mekibib Alamnie</i> (MD, Assistant professor, Internist) Department of internal medicine College of medicine and health science Bahirdar university Email-Jemberiemekbib24@gmail.com</p> <p><i>Genet Gedamu(MSc)</i> Public Health Researcher Department Environmental health School of public health College of Medicine and Health Sciences Bahir Dar University Email:geni-31280@yahoo.com</p>
Title	<p>Outcomes of Venous-Thromboembolism and clinical Characteristics among adult venous thromboembolism medical patients.</p>
Study Period	<p>August 1 to September 15, 2021</p>
Project Area	<p>Tibebe Ghion specialized Hospital and Felege Hiwot Referral Hospital</p>

Declaration

I undersigned, declared that this is my original work, has never been presented in this university, and that all the resources and materials used for the research, have been fully acknowledged.

Principal Investigator

Name: Dr. Bisrat Ginfre (MD, Year III medical resident)

Signature: -----

Date: -----

Advisors

Name: Genet Gedamu (MSc, Environmental Health)

Signature: -----

Date: -----

Name: Mekibib. (MD, Assistant professor, Internist)

Signature: -----

Date: -----

.

BAHIR BAR UNIVERSITY
COLLEGE OF MEDICINE AND HEALTH SCIENCE
SCHOOL OF MEDICINE
DEPARTMENT OF INTERNAL MEDICINE

Approval of Dissertation/Thesis for Defense

I here by certify that I have supervised, read, and evaluated this thesis/dissertation titled “Outcomes of Venous-Thromboembolism and clinical Characteristics among adult venous thromboembolism medical patients at Tibebe Ghion Specialized hospital and Felege Hiwot Referral hospital” by Dr.Bisrat Ginfrie (Year III medical resident) prepared under my guidance. I recommend the thesis/dissertation be submitted for oral defense.

Genet Gedamu (Msc.Environmental Health) _____ _____
Advisor’s name Signature Date

Dr.Mekibib Alamnie (MD, internist and Nephrology Fellow) _____ _____
Advisor’ name Signature Date

Dr. Tilahun (MD, Internist) _____ _____
Department Head Signature Date

BAHIR BAR UNIVERSITY
COLLEGE OF MEDICINE AND HEALTH SCIENCE
SCHOOL OF MEDICINE
DEPARTMENT OF INTERNAL MEDICINE

Approval of Dissertation/thesis for defense result

As members of the the board of examiners, we examined this dissertation/thesis titled with “Outcomes of Venous-Thromboembolism and clinical Characteristics among adult venous thromboembolism medical patients at Tibebe Ghion Specialized hospital and Felege Hiwot Referral hospital” by Dr.Bisrat Ginfrie.We here by certify that the thesis/dissertation is accepted for fulfilling the requirements for internal medicine specialty program.

Board of Examiners

External examiner name	Signature	Date
_____	_____	_____

Internal examiner name	Signature	Date
_____	_____	_____

Chair person’s name	Signature	Date
_____	_____	_____

List of acronym

BDU-Bahir Dar University
CT Scan-Computerized Tomography Scan
DGH -Douala General Hospital
DVT-Deep venous thromboembolism
FHRH-Felege Hiwot Referral Hospital
JUMC-Jima University Medical College
L-DVT-Lower Limb Deep Venous Thrombosis
PTE-Pulmonary thromboembolism
SPHMMC-St.Paulos Millenium Medical College
TASH- Tikur Anbesa Specialized Hospital
TGSH- Tibebe Ghion Specialized Hospital
VTE-Venous thromboembolism,

Acknowledgments

I would like to express my deepest gratitude to my advisors Dr. Mekibib and Ms. Genet Gedamu for advising and guiding me in the preparation of this research paper for the completion of the post-graduate program. I would like to thank BDU, CMHS for offering me such opportunity. I would like to say thanks to those who work in the TGSH and FHRH for availing of medical records and documentation and residents who have been involved in data collection.

Table of figures

<i>Figure 1: Type of venous thromboembolism at FHRH and TGSH from 2019-2021</i>	16
<i>Figure 2 Site of Venous thromboembolism at FHRH and TGSH within 2year period from June 2019-June 2021</i>	17
<i>Figure 3 Anatomic location of DVT at FHRH and TGSH from 2019-2021</i>	18

List of tables

<i>Table 1 Clinical characterstic and Sociodemographic feature of Venous Thromboembolism patients at FHRH and TGSH in 2 year period June 2019 –June 2021</i>	15
<i>Table 2: Crosstabulation for clinical characteristics with the outcome of Venous thromboembolism at TGSH and FHRH in the year 2019-2021</i>	19

Table of content

Contents

Declaration.....	III
Approval of Dissertation/Thesis for Defense.....	IV
List of acronym.....	VI
Acknowledgments.....	VII
Table of figures.....	VIII
List of tables.....	VIII
Table of content.....	IX
Abstract.....	XI
1. Introduction.....	1
1.1. Background of the study.....	1
1.2. Statement of the problem.....	2
1.3. Significance of the Study.....	3
2. Literature Review.....	4
2.1. Venous thromboembolism.....	4
2.2. Burden of Venous thromboembolism.....	4
2.3. Clinical characteristics of venous thromboembolism.....	5
2.4 Outcomes of Venous thromboembolism.....	7
3. Objectives of the Study.....	8
3.1. General objective.....	8
4. Methods.....	9
4.1. Study design.....	9
4.2. Study period:.....	9
4.3. Study area.....	9
4.4. Population.....	9
4.4.1. Source population.....	9
4.4.2. Study population.....	10
4.5. Inclusion criteria.....	10
4.6. Exclusion criteria.....	10
4.7. Study variables.....	10
4.6. Operational definition of Terms.....	11
4.6. Sample size determination and sampling technique.....	11

4.7. Data Collection Procedure	11
4.6.2. Sampling techniques	12
4.8. Data Quality Assurance	12
4.9. Data Processing and Analysis	12
4.11. Ethical Considerations	13
4.12. Dissemination	13
5. RESULTS	14
5.1. Sociodemographic and Clinical Characteristics of Study Participants	14
5.3. Clinical Presentation and laboratory features of the Study Participants	16
5.4 Outcome of Venous Thromboembolism.....	18
5.4 clinical characteristics and with the outcome of VTE	18
6. Discussion	20
7. Conclusion	23
8. Limitations	23
9. Recommendations.....	23
Annex-I. References	24
Annex-II -Data abstraction format.....	27

Abstract

Background: Venous thromboembolism is the third most common cause of vascular mortality worldwide and comprises deep vein thrombosis and pulmonary embolism. Pulmonary embolism has been called “the leading cause of preventable death in hospitalized patients” often has concomitant DVT. Venous thromboembolism is a multifactorial disease. There is no uniform clinical characteristics of venous thromboembolism and outcomes vary in different parts of the world. There is scarce information about outcomes of venous thromboembolism and clinical characteristics in Ethiopia.

Objective: The objective of the study was to assess the outcomes and describe clinical characteristics of venous thromboembolism among adult medical venous thromboembolism patients at Tibebe-Ghion specialized Hospital and Felege Hiwot Specialized Hospital from June 2019-2021.

Method: A cross-sectional study design was applied to patients diagnosed with VTE at admission or during hospitalization in the medical wards and all the necessary data were collected from the patient card. Data entered to SPSS 23 software for analysis. The sample was 244. The clinical characteristics of VTE patients are described with percentage frequency, mean and standard deviation.

Result: Out of 244 VTE patients 59% were female of this 39.6% were in a pregnant and postpartum state, the mean age + SD of the participant is 41.6 ± 16.8 , and 67.9% reside in a rural area, 94.3% were DVT, and the rest PTE and DVT with PTE were 2.4% each. Anatomically 72.4% were proximal DVT, 21.5% proximal and distal DVT. Most of the patients were presented with leg pain, swelling, pitting edema, and tenderness 96.3%, 96.7%, 72%, and 84.1% respectively. Of all VTE 13% were having malignancy, 11.8% had an acute infection, 11.4% were immobilized. The 30-day all-cause mortality of venous thromboembolism patients was 2.8%. Majority of death was from patients having chronic renal disease, malignancy a chronic lung disease. The mean +SD length of hospital stay was 8.9 ± 4.86 days.

Conclusion: Mortality of VTE low. DVT account high percentage of VTE mainly left proximal DVT. Leg pain and swelling dominant presentation. Majority of VTE patients have pregnancy and postpartum state, malignancy, acute infection, and immobilization. I recommend both TGS and FHRH medical teams to have early consideration of venous thromboembolism and timely initiation of treatment and proper follow-up for this patient group.

Keywords: Venous thromboembolism, outcomes, Clinical characteristics, adult medical patients

1. Introduction

1.1. Background of the study

After ischemic heart disease and stroke, venous thromboembolism (VTE) is one of the three leading causes of cardiovascular disease worldwide. (1) Venous thromboembolism (VTE) is caused by clot formation in the venous circulation and manifests as deep vein thrombosis (DVT) and pulmonary embolism (PE). (2)

More than half of all hospitalized patients worldwide are at risk for VTE, and surgical patients appear to be at greater risk than medical patients (3). Hospitalization is associated with approximately 25% of all cases of VTE, and 50 to 75% of VTE cases in hospitalized patients occur in those on medical service. It is a common and potentially preventable disease in hospitalized patients (2)

Numerous risk factors for VTE have been identified in both hospitalized medical and surgical patients and the general population who are not hospitalized. Rudolf Ludwig Karl Virchow was the first to identify three major clinical factors linked to an increased risk of thrombosis. The Virchow triad consists of three factors: vessel wall damage caused by inflammation or trauma; changes in blood flow or volume caused by immobility, ischemia, and other conditions; and hypercoagulable factors present in the blood, including inherited and acquired coagulation disorders. Age, obesity, surgery, general anesthesia, trauma, immobility, malignancy, neurologic disease, central venous catheter, and prior superficial vein thrombosis, as well as varicose veins, congenital or acquired thrombophilia, have all been proposed as risk factors. (4, 5)

Various studies were conducted about VTE in different parts of the world on the outcomes of VTE and clinical characteristics but there are no uniform patterns in the outcomes and clinical characteristics of VTE.

1.2. Statement of the problem

Venous thromboembolism (VTE) is the third leading cause of vascular death worldwide, and it includes deep vein thrombosis (DVT) and pulmonary embolism (PE). In clinical practice, approximately two-thirds of VTE episodes manifest as DVT and one-third as PE with or without DVT. Pulmonary embolism has been dubbed "the leading cause of preventable death in hospitalized patients" and "the number one priority for improving patient safety in hospitals" (4)

According to epidemiological studies, the annual incidence rates for PE range from 39-115 per 100 000 population, while the incidence rates for DVT range from 53-162 per 100 000 population. PE is estimated to cause >300,000 deaths in the United States each year, ranking high among the causes of cardiovascular mortality. (5)

An epidemiological model in six European countries estimated that more than 370 000 deaths with a total population of 454.4 million were caused by VTE. Thirty-four percent of these patients died suddenly or within a few hours of the acute event before treatment could be initiated or take effect. In the remaining patients, 59 percent died as a result of acute PE that was diagnosed after death, while only 7 percent of those who died early were correctly diagnosed with PE before death. (5) Because of the general lack of specificity in the presentation of VTE and its potential for rapid mortality, identifying its risk factors will aid in the implementation of preventive measures.

Despite my search for literature reviews, there is insufficient data in Ethiopia on the outcomes of VTE and the clinical characteristics of VTE. There are a significant number of patients admitted with the diagnosis of DVT and PTE in our day-to-day clinical activity. There are also a significant number of patients who died in the ward and ICU with a possible cause of death attributed to PE before the diagnosis is made or treatment initiated. As a result, there was a clear need for such research to be conducted to determine the outcomes of VTE and the factors associated with VTE. Knowing the factors associated with VTE and the outcomes of VTE will aid in emphasizing preventive measures and the best treatment approach for venous thromboembolism.

1.3. Significance of the Study

This study aims to assess outcomes of venous thromboembolism and describe clinical characteristics of adult medical patients with venous thromboembolism at Tibebe Ghion Specialized Hospital and Felege Hiwot specialized Hospital, Bahirdar Ethiopia within the two years. This study will help to inform the health care professional, physicians, and nurses for early diagnostic considerations as well as treatment and preventive measures before severe complications and death develop. This is also important for pharmacists to have an adequate supply of preventive and therapeutic drugs in hospitals.

This research is also important for healthcare administrators and policymakers at the regional and federal levels to budget for guideline development, diagnostic equipment, and therapeutic options. The study's findings will also address the issue of data scarcity and serve as a springboard for future research.

2. Literature Review

2.1. Venous thromboembolism

A study in Johannesburg, South Africa(2018) showed venous thromboembolism was identified in 74 patients; 56(75.7%) with isolated DVT and 13 (17.6%) with isolated PE. There were five (6.8%) patients who had a concurrent DVT with PE. (20) A study in Saudi Arabia(2021) Alshahrani et.al the most common VTE sites were the left lower limb (38.5%) followed by the right lower limb (20.5%) then bilateral lower limbs (12.2%). (21)

A Study Cameroon(2015) on the pattern of venous thromboembolic diseases in from 1445 patients admitted for medical illnesses, a total of 79 venous thromboembolic diseases were detected (55 deep vein thrombosis, 14 pulmonary embolisms, 9 post phlebitis syndromes, and 1 cerulean Alba doles). The leading risk factors were prolonged immobilization (100%), age > 40 years (78.9%), obesity (43%), long-distance travel (30.4%) and HIV-AIDS (21.50%). Thirty-one (40.5%) had ≤ 2 cumulative risk factors, and 8 (10.1%) more than 4. (6)

A study in Jima was conducted among adult patients diagnosed with DVT, who was admitted to inpatients wards of JUMC and SPHMMC (2020) showed that the anatomic site of DVT, the majority of patients (124/ 96.1%) had the thrombosis of the lower extremities extending from the common iliac vein to the popliteal veins. About 115 (89.1%) of participants were found to have unilateral and only 14 (10.1%) patients have combined involvement of bilateral DVT, whereas approximately two-third of participants had left lower extremity involvement. On the Doppler ultrasonography examination, the majority of 103 (79.8%) of DVT cases were proximal and only 21 (16.3%) cases were located distal area for the lower extremity. (7)

2.2. Burden of Venous thromboembolism

Using National Hospital Discharge Survey discharge diagnosis codes from 2007 to 2009, an estimated 548,000 VTE hospitalizations occurred each year among USA residents aged 18 years, of which 349,000 were DVT and 278,000 were PE. (8) The majority of clinical studies that did not include autopsies reported that the incidence of clinically diagnosed DVT was roughly twice that of PE. Anderson et al reported 48 per 100,000 incidences of first-time DVT, compared to 23 per 100,000 for PE (32 percent of VTE cases). (9) According to the CDC (2018), an estimated 100,000 Americans die each year from VTE. According to one US research, 10-30% of people will die within one month of being diagnosed, and sudden death is the first symptom in approximately 25% of people who have a PE, costing the US health care system more than \$10 billion each year. (6).

Two studies in Africa showed the prevalence of VTE varied from 4%-11.5%. The first one in Zambia shows Prevalence of DVT of the lower limbs was 11.1 % (33/296). The prevalence of proximal lower limb DVT was 9.1%. Eighty-two percent (27/33) of all patients with DVT had proximal lower limb DVT. Asymptomatic lower limb DVT was noted in 85 % (28/33) of all patients with DVT. (10) The second one in Cameroon Cross-Sectional Study VTE was seen in 4.4 cases per 1000 admissions in the internal medicine unit and ICU. About twelve cases of VTE are seen yearly at the DGH, with in-hospital mortality of 10%. (11)

According to an Ethiopian retrospective cross-sectional study conducted at TASH, 5.5 percent of patients develop VTE during their hospital stay for more than 15 days. (2) VTE associated with a recent hospitalization for medical illness imposes a significant economic burden on society across all hospital and ambulatory care services provided.

2.3. Clinical characteristics of venous thromboembolism

A cross-sectional study in Turkey (2018) found that in patients with VTE average age was 60.22_+18.56 years, 51.20 percent were male, 46.30 percent had a comorbid disease, and 27.60 percent had cancer. (12) Several studies in Africa revealed various clinical characteristics of venous thromboembolism. Hypertension (37.2 percent), immobility (20.5 percent), long-distance travel (17.9 percent), and HIV infection (14.1 percent) were seen VTE at Douala General Hospital (DGH) in Cameroon (2018). (11) A descriptive,

cross-sectional analytical study in Zambia (2016) showed that the mean age of patients with DVT was 42.12 years, the mean duration of hospitalization was 11.91 days, and infectious disease accounted for 76 percent (25/33) of the primary diagnosis. Tuberculosis was the most common infectious disease among DVT patients, accounting for 60.6 percent (20/33) of all infections, and HIV was positive in up to 70 percent (23/33) of all DVT patients. (11) The most common VTE sites were the left lower limb (38.5%) followed by right lower limb (20.5%) then bilateral lower limbs (12.2%)

The third Cameroon (2020) assessment of VTE risk factors before admission revealed that: age >40 years (57.6 percent), long-term immobility (23.9 percent), and swollen legs (21.9%) were predominant, and during hospitalization: immobility with bathroom privileges (31.5 percent), and complete immobilization (8.3 percent) were the most common and in female patients were pregnancy/postpartum (22.2 percent). (13)

A study in Cameroon (2019) venous thromboembolic disease in a semi-urban setting in twenty-two patients admitted for VTE revealed that 54.4 percent were men. The average age was 54.9 ±13.9 years. Clinical characteristics of patients were immobility (40.9 percent), HIV infection (22.7 percent), tuberculosis (18.2 percent), obesity (13.6 percent), and cancer (13.6 percent). Nineteen (86.4%) patients had deep venous thrombosis (DVT), and three (13.6%) had a pulmonary embolism (PE). One patient had both a DVT and a PE at the same time. (15)

According to one cross-sectional study for VTE conducted at TASH in Ethiopia, age 40 years (48 percent), having lung diseases including pneumonia (39 percent), acute infection (37.5 percent), congestive heart failure (20.5 percent), and having cancer and/or chemotherapy. (2)

Another study at Jima University found that 84 out of 129 (65.1 percent) of the participants were female, the mean + SD age of the participants was 38.63 + 17.67 years, and that the majority of the patients, 76 (58.9 percent) were between the ages of 18 and 35 years and 57.4% of participants were residing in a rural area. Prolonged immobilization 113 (87.6 percent), prior surgical history 35 (27.1 percent), pregnancy 32 (24.8 percent), chronic lung disease (17.8 percent), active cancer (10.9 percent), and congestive heart failure (15.5 percent) were seen with DVT occurrence among study participants. (7)

2.4 Outcomes of Venous thromboembolism

A multi-center study in the RIETE registry in Europe about clinical presentation and outcome of venous thromboembolism in COPD patients confirmed that PE was the main cause of death (2.3%), followed by respiratory insufficiency. (16) One cross-Sectional Study in Cameroon, Sub-Saharan Africa,(2018) showed there were 10% in-hospital deaths. (11)

In a case series of twenty-two patients admitted for venous thromboembolic disease in a semi-urban setting in Cameroon(2019), the median length of stay in the hospital was 9.5 days, and the in-hospital mortality rate was 13.6 percent. (13) Another study on patient outcomes after deep vein thrombosis and pulmonary embolism was conducted in Massachusetts in 2008. At 1-month follow-up, mortality in patients who initially presented with PE was significantly increased (13.0 percent vs 5.4 percent). (17)

The findings of a prospective study on venous thromboembolism in patients with renal insufficiency from the RIETE Registry show that patients with VTE who have renal insufficiency had an increased incidence of both fatal PE and fatal bleeding. (18) One Ethiopian study Deep Venous Thrombosis at two Tertiary Hospitals in found that all-cause mortality was 3.1 percent among 146 VTE patients over three months. (7)

3. Objectives of the Study

3.1. General objective

The general objective of the study is to assess the outcome of venous thromboembolism and describe clinical characteristics among adult medical VTE patients at two tertiary Hospitals in Bahirdar.

4. Methods

4.1. Study design

Cross-sectional study design was used.

4.2. Study period:

The study was conducted from August 1 to September 15, 2021.

4.3. Study area

The study was conducted at Tibebe Ghion Specialized Hospital and Felege Hiwot Referral Hospital Bahirdar, Ethiopia, for patients who were admitted to the internal medicine department from June 2019 to July 2021. Bahirdar is the capital of Amara Regional state one of the top tourist destinations located at the exit of Abay from Lake Tana at an altitude of 1820 meters above sea level. The city is located approximately 578 km northwest of the center of Addis Ababa. In the city, there are two comprehensive specialized hospitals (one university hospital and regional hospital) and five general hospitals (four private and one government). Tibebe Ghion specialized hospital one of the university hospitals located about 10 km south from the city center and about 7 km from the new bus station on the way to Adet district and about 23 km from the Blue Nile Falls (locally called 'Tis Esat' (Smoke of Fire). TGS is a tertiary university teaching hospital with 450 bed capacity out of which 72 are occupied by medical adult patients and FHRH is a regional non-teaching tertiary hospital with a total number of beds 350 and more than 80 beds were medical patients.

4.4. Population

4.4.1. Source population

The source population included all adult medical patients diagnosed with venous thromboembolism at Tibebe-Ghion Specialized Hospital and Felege Hiwot Referral Hospital.

4.4.2. Study population

All adult medical patients diagnosed with Venous Thromboembolism at TGSB and FHRH between June 2019 and July 2021 and their documentation is available during the study period.

4.5. Inclusion criteria

Age \geq 18yrs

Diagnosed with VTE (DVT and/or PTE)

Doppler ultrasound confirmed DVT patients and or

Chest CT Scan confirmed PTE cases

4.6. Exclusion criteria

Those who went against medical advice or

Those who are referred to another center before 01month

4.7. Study variables

- Outcomes of Venous Thromboembolism
- Age
- Sex
- Address(Place of residence)
- Total day of immobility \geq 72 hr.
- Stroke / Paraplegia
- HIV –AIDS
- Tuberculosis
- Acute infections (cellulitis, meningitis, pneumonia, abscess)
- Malignancy / On chemotherapy
- Diabetes and complications
- Heart failure
- Renal failure / Nephrotic syndrome
- Chronic lung disease (COPD, Bronchiectasis, B.Asthma.)
- Rheumatologic diseases (SLE, RA.)
- Postoperative state within 1month

- Trauma including fracture
- Pregnancy/ Postpartum(< 1 month) ,History of unexplained still birth/ recurrent spontaneous abortion
- Type of VTE and anatomic location
- Type of anticoagulation and duration of anticoagulation
- Platelet and coagulation test results
- Length of hospital stay

4.6. Operational definition of Terms

VTE- Venous thromboembolism refers to a blood clot that starts in a vein that encompasses deep venous thrombosis (DVT) and pulmonary embolism (PE) having objective evidence with Doppler US or Chest CT Scan.

DVT - Deep vein thrombosis is a blood clot formation within deep veins of the lower extremity or upper extremity having varied presentations from asymptomatic to a classic symptomatic (pain, swelling, redness, warmth) with objective evidence of Doppler US incompressibility/non-collapsing vein or clot visualized in the vein.

Embolism -obstruction of an artery by a clot of blood visualized with Chest CT Scan as filling defect.

PE- Pulmonary embolus refers to obstruction of the pulmonary artery or one of its branches by material (e.g. thrombus, tumor, air, or fat) that originated elsewhere in the body confirmed with chest CT-scan for evidence of filling defect.

Outcome-occurrence of death or improvement within 30 days of the first visit.

4.6. Sample size determination and sampling technique

The sample size was determined by using Epi info 7 by taking the value of proportion (p=50 percent), with a 95 percent confidence interval (Z=1.96) and a marginal error of 0.05 percent. Using Epi info version 7 and the above assumptions, the estimated sample size becomes 222 patients. By adding a 10% non-response rate, the sample size was 244.

4.7. Data Collection Procedure

Data was collected from the patient chart physician order sheet using a predesigned data abstraction format on the patient's socio-demographic characteristics, comorbidity and other disease conditions, type of venous thromboembolism, type of anticoagulation treatment, outcomes of VTE improvement, development of complications such as post phlebitis syndrome, bleeding, heparin-induced thrombocytopenia, length of hospital stay, and death. A radiologist confirmed the diagnosis of VTE, i.e. DVT with Doppler ultrasonography and PTE with a chest CT. Deep venous thrombosis was diagnosed when there was no compressibility of veins in the lower and upper extremities or direct visualization of a clot. When a filling defect in the pulmonary artery or its branches was included in the study, PE was diagnosed. The investigator and residents working in the medical ward collected the data after being trained on how to do so.

4.6.2. Sampling techniques

Random sampling was employed systematically. Within two years from June 2019 to July 2021, 527 venous thromboembolism patients were admitted to medical wards based on their medical record number (MRN) from the two tertiary hospitals. Based on their medical record number, they were reregistered from 1 to 527 with the new prepared notebook. All patients admitted with a diagnosis of venous thromboembolism were taken as the study population of 527. The sample population was 244, with a k-value of 2 and the first sample was selected by lottery method, then every other sample was taken from the notebook until 244.

4.8. Data Quality Assurance

The investigator oversaw data collection. The principal investigator checked the collected data, and any incomplete questionnaires were cleaned before data entry. One week before the actual survey, a pretest was conducted at FHRH hospital by taking 5% of the total population, and necessary changes were made before actual data collection on the study.

4.9. Data Processing and Analysis

Data were entered into the SPSS-23 version software for analysis. Descriptive statistics were used to describe the study population's characteristics as a percentage, frequency,

mean, and standard deviation was calculated for the variables. Finally, depending on the type of data, the results were presented in the form of tables, graphs, and percentages.

4.11. Ethical Considerations

Bahir Dar University College of Medicine and Health Science Ethics Review Committee granted ethical clearance, and a letter of support was sent to Tibebe Ghion specialized Hospital and Felege Hiwot Referral Hospital. Confidentiality is maintained by not mentioning the names of study participants, storing data collection forms in a secure cabinet, and using a secure password to access electronic data files.

4.12. Dissemination

The study's findings will be disseminated through publications and a presentation at the conference. The study's findings will be shared with Bahirdar University, Tibebe Ghion specialized hospital, and Felege Hiwot Referral Hospital.

5. RESULTS

5.1. Sociodemographic and Clinical Characteristics of Study Participants

Among 244 illegible patients Males accounted for 100 (41 %) while females were 144 (59%). The participant's mean age \pm SD was 41.6 ± 16.8 . The majority of patients were under the age of 40, accounting for 53.7 %(132), with the rest falling into the age groups of 40-60 years and over 60 years, accounting for 77 (31.3 %) and 35(14.4 %) respectively. The vast majority of patients were in rural areas 167(67.9%) and 77 (31.3 %) were reside in an urban area. Out of 144 female patients with VTE, 57(39.6%) were pregnant or postpartum, 32(13%) had malignancy with or without chemotherapy, 29(11.8 %) had acute infection including pneumonia, cellulitis, meningitis, any abscess, 28(11.4%) had immobilization from any cause, 18(7.3%) had trauma and fracture, and 18(7.3%) had the postoperative condition. (*Table 1*)

Table 1 Clinical characteristic and Sociodemographic feature of Venous Thromboembolism patients at FHRH and TGSB in 2 year period June 2019 –June 2021

Variables	Categories	Frequency	Percent (%)	95% CI	
				Lower limit	Upper limit
Sex	Male	100	41.0	33.6	47.5
	Female	144	59.0	52.5	66.4
Age	<40	132	54.1	48.4	59.8
	40-60	77	31.6	26.3	37.7
	>60	35	14.3	9.9	18.4
Address	Rural	167	68.4	62.7	74.6
	Urban	77	31.6	25.4	37.3
Neurologic disease	Yes	9	3.7	1.6	6.1
	No	235	96.3	93.9	98.4
Heart failure	Yes	8	3.3	1.2	5.7
	No	236	96.7	94.3	98.8
Renal disease	Yes	12	4.9	2.5	7.4
	No	232	95.1	92.6	97.5
Chronic lung disease	Yes	7	2.9	.8	5.3
	No	237	97.1	94.7	99.2
Diabetes mellitus	Yes	6	2.4	.8	4.5
	No	238	97.5	95.5	99.2
Gastrointestinal and hepatobiliary disease	Yes	24	9.8	6.6	13.9
	No	220	90.2	86.1	93.4
Rheumatologic disease	Yes	5	2	0.4	3.7
	No	239	98	96.3	99.6
Malignancy with or without chemotherapy	Yes	32	13.1	9.4	16.8
	No	212	86.9	83.2	90.6
Postoperative condition	Yes	18	7.4	4.5	10.7
	No	226	92.6	89.8	95.5
Trauma or fracture	Yes	18	7.4	4.5	10.7
	No	226	92.6	88.5	95.9
Previous VTE or Varicose vein	Yes	14	5.7	2.9	8.2
	No	230	93.5	91.8	97.1
Pregnancy and postpartum state	Yes	57	39.6	32.6	46.5
	No	87	60.4	53.5	67.4
	Missed(male)	100	41	-	-
Immobilization	Yes	28	11.5	7.4	15.9
	No	216	88.5	84.1	92.6
HIV-AIDS Patient	Yes	13	5.3	2.9	8.6
	No	231	94.7	91.4	97.1
Active tuberculosis	Yes	9	3.7	1.6	5.7
	No	235	96.3	94.3	98.4
Acute infection	Yes	29	11.9	8.2	16.0
	No	215	88.1	84.0	91.8

5.3. Clinical Presentation and laboratory features of the Study Participants

DVT was found in 232 (94.3%) of the 244 venous thromboembolism patients, the rest was PTE and PTE with DVT accounting for 2.4% (6) of each as presented in (figure 2). The majority of VTE was in the lower extremity 226(91.9%), the remaining was upper extremity 2(0.8%), pulmonary artery with lower extremity 8(3.3%), pulmonary artery with upper extremity one patient (0.4%), and pulmonary artery 7(2.9%) as presented in (figure-3). About 230 (94.3%) patients were found to have unilateral involvement of which left leg DVT 154(62.8), right leg 66(26.8%) and 14 (5.7%) patients were having bilateral DVT.

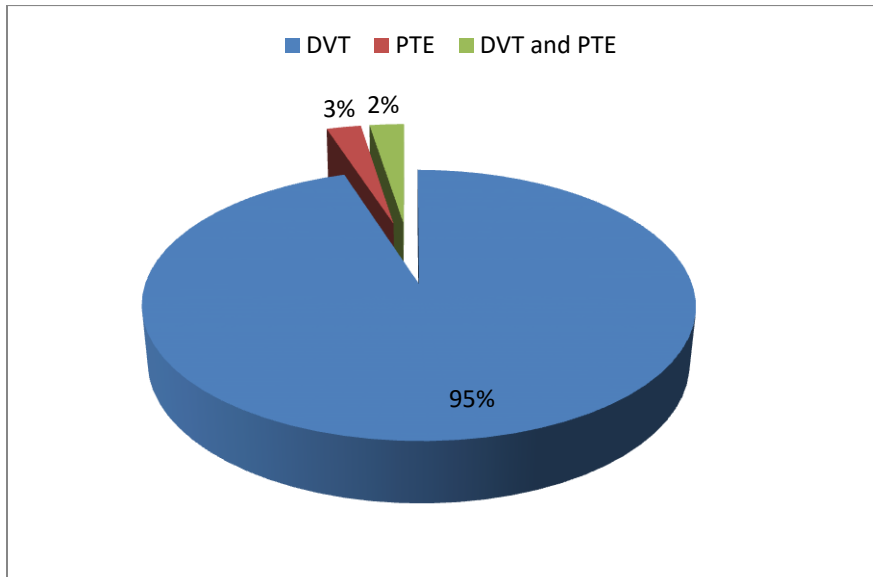


Figure 1: Type of venous thromboembolism at FHRH and TGSH from 2019-2021

On Doppler ultrasound examination and chest CT scan examination for anatomic localization of VTE proximal DVT found in 178(72.4%), distal DVT 5(2%), proximal and distal DVT 53 (21.5%) as shown in (figure-4) and main and segmental pulmonary PTE account 8(3.3%) and 6(2.4%) respectively. Most VTE patients were presented with symptoms of leg pain and swelling 237(96.3%) and 238(96.7%) respectively and clinical signs of pitting edema and tenderness 177(72%) and 207(84.1%) respectively. Most

patients with PTE were having chest pain, dyspnea, and cough 21(8.5%), 16(6.5%), and 8(3.3) respectively. Only one patient with PTE was having syncope.

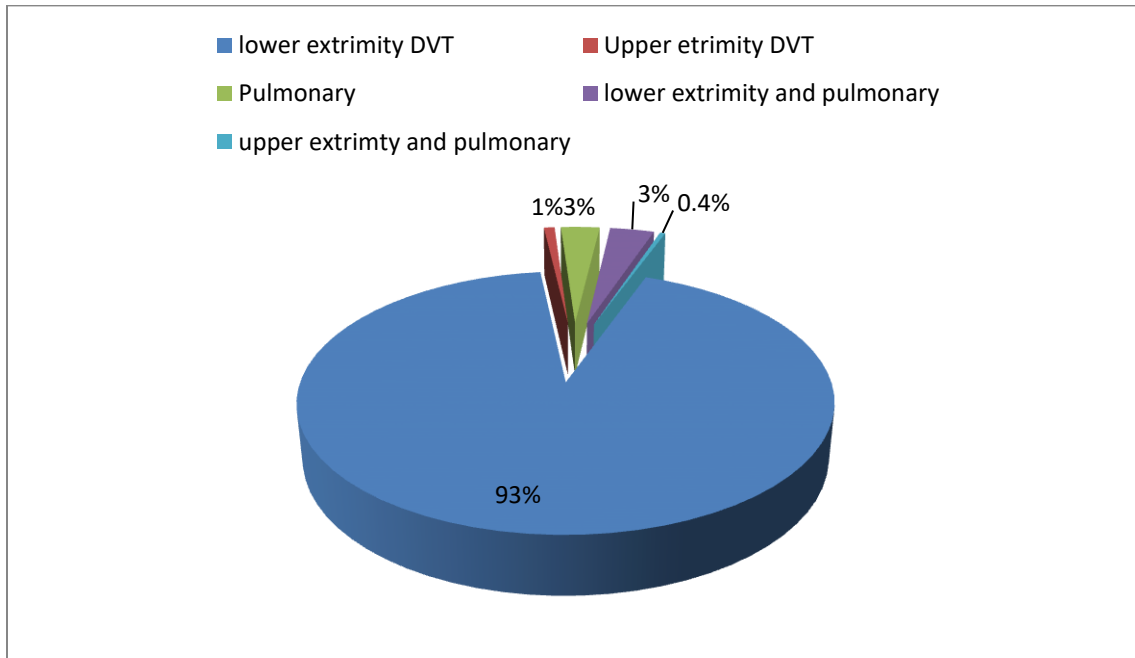


Figure 2 Site of Venous thromboembolism at FHRH and TGSH within 2year period from June 2019-June 2021

The mean + SD for hemoglobin was 11.6 ± 3 and the mean + SD for baseline platelet and discharge platelet was 272462 ± 124004 and 260492 ± 161466 for 240 and 40 respectively. The majority of patients were taking warfarin and UFH overlapped with a mean + SD of 5.85 ± 1.81 days and treatment continued with warfarin 241(98%) and the rest Enoxaparin 2(0.8%) and Rivaroxaban 1(0.4%).

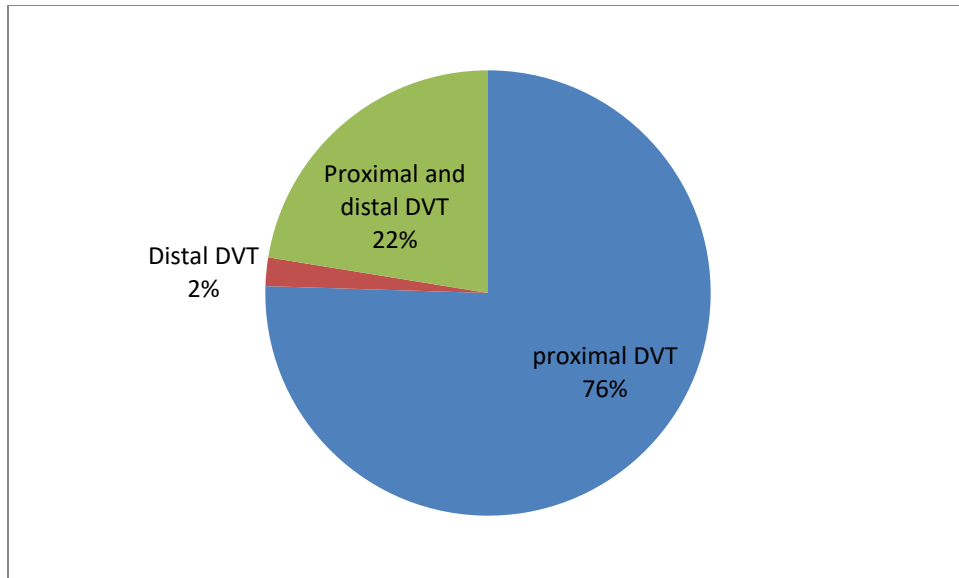


Figure 3 Anatomic location of DVT at FHRH and TGSJH from 2019-2021

5.4 Outcome of Venous Thromboembolism

Out of 244 illegible Venous Thromboembolism patients, seven patients (2.8%) died with (95%,CI= 0.8-5.3%), within 30 days of a hospital visit, and the rest 237 (97.2%) gate improved with (95% ,CI=94.7-99.2%) with their subsequent follow-up. During treatment two (0.8%) patients develop heparin-induced thrombocytopenia and one (0.4%) patient complicated with heparin-induced thrombocytopenia and bleeding. The mean +SD length of hospital stay was 8.9 ± 4.86 days.

5.4 clinical characteristics and with the outcome of VTE

The occurrence of death was seen in chronic lung disease, renal disease, and malignancy, and chest pain presentation.

Table 2: Crosstabulation for clinical characteristics with the outcome of Venous thromboembolism at TGSB and FHRH in the year 2019-2021

Clinical characteristics and sociodemographic		Death	Improved	P-value
Age category	<40	127	5	0.582
	40-60	76	1	
	>60	34	1	
Sex	Male	2	98	0.535
	Female	5	139	
Address	Urban	1	76	0.438
	Rural	6	161	
Neurologic disease	Yes	0	9	0.498
	No	7	228	
Chronic lung disease	Yes	1	6	0.04
	No	6	231	
Renal disease	Yes	3	9	<0.0001
	No	4	228	
Malignancy	Yes	3	29	0.018
	No	4	208	
Trauma	Yes	0	18	0.448
	No	7	219	
Postoperative state	Yes	0	18	0.449
	No	7	219	
Previous VTE/Varicose vein	Yes	0	14	0.508
	No	7	223	
Rheumatologic disease	Yes	0	7	0.698
	No	7	237	
HIV-AIDS	Yes	0	13	0.524
	No	7	227	
Acute infection	Yes	1	28	0.592
	No	6	209	
Chest pain	Yes	2	19	0.114
	No	5	218	
Active TB	Yes	1	6	0.131
	No	8	229	
Diabetes mellitus	Yes	0	6	0.67
	No	7	231	
Immobilization	Yes	0	7	0.334
	No	28	209	
Heart failure	Yes	0	7	0.621
	No	8	229	

6. Discussion

All-cause 30 days mortality of venous thromboembolism patients were 7(2.8%) out of 244 with (95%, CI= 0.8-5.3%) which was comparable to the previous study which was done at Jima university at the two tertiary hospitals JUMC and SPMMC deep venous thrombosis had shown all-cause mortality was 3.1% out of 146 VTE patients within 3month period, this may be due to similar sociodemographic characteristics of patients. (7). But the mortality was lower as compared to Cameron, it was 13.6% and in Massachuset, it was 13.0 % for PTE and 5.4% for DVT. ⁽¹³⁾⁽¹⁷⁾ This may be the Cameron study was short time 6months and small sample size of 22 and Massachuset study may be due to better initial workup of patients with possible PTE cases in Massachuset but missed cases with possible cause of death is ascribed to be VTE in this study with limited resource.

Of the 244 venous thromboembolism patients, DVT was found in 232 (94.3%) with (95% CI= 92.2-97.5%), and the majority of VTE was in the lower extremity 226(91.9%). About 230 (94.3%) patients were found to have unilateral involvement of which left leg DVT 154(62.8) with (95% ,CI=56.6-68.9%),anatomically majority was having proximal DVT in 178(72.4%) with(95%,CI= 67.2-78.7) and proximal and distal DVT 53 (21.5%). This was comparable with different studies Cameron study(2018), Cameron study(2019), and study in Jima University (2019) and Johansberg Study(2018) ⁽¹¹⁾⁽¹⁸⁾⁽⁷⁾⁽²⁰⁰⁾ this may be left lower limb is anatomy compression of left common iliac vein by the right common iliac artery make it prone for venous thrombosis.

In this study, the highest VTE incident was found in the age less than 40 years 53.7% with mean age + SD of the participant is 41.6±16.8years which was comparable with study at Jima University with the mean + SD age of participants was 38.63 ±17.67 year and the majority of the patients 76 (58.9%) were within the age group between 18 and 35 years. (7) this may due to similar sociodemographic characteristics of participants. This was also closer with studies conducted in different countries Douala General Hospital (DGH) in Cameron (2018), in Zambia showed the mean age of patients with DVT was 42.12 years, another study in Cameron (2020) admission showed age >40 years (57.6%),

and studies in venous thromboembolic disease in Cameroon (2019) showed that mean age was 54.9 ± 13.9 years, but occur at an early age as compared to study in Turkey(2016), the mean age of the patients was 60.22 ± 18.56 years. (12)(15)(11).

In this study 100(41%) were male, and the majority were female 144(59%) out of 244 which was a comparable to study in Jima University 84 out of 129 (65.1%) were female. (7) this may be due to similar sociodemographic characteristics but studies in venous thromboembolic disease in Cameroon (2019) showed the majority were men (54.4%) (15) this may be the small sample size and short study period may miss true representative population.

Malignancy with or without chemotherapy were seen in 32 (13%) with 95% (CI=8.3-17.5) which was comparable with study in Jima University Hospital was having (10.9%) active cancer (7) which may be due to similar sociodemographic features having malignancy is one of the common prothrombotic condition via different mechanisms activating tissue factor, releases cancer procoagulant, tumor-specific procoagulant and various comorbidities associated with malignancy will enhance further thrombus formation. It was comparable with a study in Cameroon (2019) 13.6% of VTE patients were having cancer (17), but it was less than a study conducted in (2018) Turkey 27.60% were diagnosed with cancer. (14) may be in Turkey high prevalence of malignancy as they are an affluent nation with an increased peak age of life expectancy and refined diet consumption will increase the chance of malignant occurrence with VTE

The second common clinical condition in this study was acute infection including pneumonia, cellulitis, meningitis, any abscess 29 patients (11.8%) with 95% (CI=8.2-16.0), and it was lower than another two studies in Ethiopia at TASH(37.5%) this may be most of the patients at TASH study was from prolonged hospitalized patients with a high risk of infection(2). Having an acute infection is one of the prothrombotic conditions by the various mechanism by activating platelet, inducing endothelial damage which activates tissue factor, fibrin deposition and thrombus formation and the acute infection may also debilitate the patient and immobilize to enhance further thrombosis due to stasis.

The other chronic infectious conditions which were found in this study were HIV-AIDS 5.3% with 95% (CI=2.9-8.6) which was consistent with studies conducted in Jima University Hospital 4.6% (7) due to similar sociodemographic features and this condition is prothrombotic by various mechanism activating coagulation cascade, predispose for other opportunistic infections debilitate the patient make prone for further thrombosis. In the Cameron study HIV infection (22.7%) which was higher than our study, may be variation in the epidemiology of HIV-AIDS.

In this study 28 patients (11.4%) with 95% (CI=7.4-15.9) were found to have immobilization from any cause, which were comparable with Cameron study (2020) 8.3 percent were having complete immobilization but it was lower than Cameron study (20.5%) and study conducted at Jima University Hospital 113(87.6%) prolonged immobilization ,this may variation in demographic features and high majority were having previous surgery. ⁽⁷⁾⁽¹⁵⁾

In this research 18(7.3%) were having trauma and fracture and, and 18 patients (7.3%) 95% (CI= 4.5-10.7) postoperative conditions which were lower than the study conducted in JUMC 15 (11.6) were having trauma and 35 (27.1%) prior surgical history (7). This variation may be due to retrospective nature may not digout history of trauma and surgery as compared to Jima University prospective.

7. Conclusion

In this study, the 30-day mortality of venous thromboembolism was slightly lower than most of the previous studies. The outcome of death was seen with common comorbid illness specifically the presence of chronic lung disease, malignancy, and renal disease. Venous thromboembolism was more common in the pregnant and postpartum state, malignancy with or without chemotherapy, acute infection, immobilization from any cause, trauma, and fracture, and postoperative condition. Majority of VTE were in the left lower limb. Majority of VTE were left lower limb. Majority patients were found to have unilateral involvement of which left leg DVT. Most VTE patients were presented with symptoms of leg pain and swelling.

8. Limitations

The result of this study may not be generalizable to the population at large because it was retrospective chart review and referral biases. The sample size was also small though it was comparable with previous studies makes it illegible for logistic regression to see the association of outcome with variables. Because of the secondary nature of the data, it was difficult to find some important variables like the history of smoking, hormonal contraceptive use, weight and height measurement, and proper timely laboratory measurement.

9. Recommendations

I recommend both TGSH and FHRH medical teams to have early consideration of venous thromboembolism and timely initiation of treatment and proper follow-up for patient groups having malignancy, chronic lung disease, and renal disease before devastating complications and death develop. I recommend that the regional health bureau and BDU address the significant shortage of diagnostic and monitoring machines

for warfarin treatment. I recommend that the pharmacist team obtain alternative medications for VTE.

Annex-I. References

1. Danwang C, Temgoua MN, Agbor VN, Tankeu AT, Noubiap JJ. Epidemiology of venous thromboembolism in Africa: A systematic review and meta-analysis protocol. *BMJ Open*. 2017;7(10):1–4.
2. Ahmed F, Hussen S, Assefa T. Venous Thromboembolism Risk, Prophylaxis and Outcome in Hospitalized Patients to Medical Wards of University Teaching Hospital. *J Clin Exp Cardiol*. 2019;10(1).
3. Cohen AT, Tapson VF, Bergmann J, Goldhaber SZ, Kakkar AK, Deslandes B, et al. Venous thromboembolism risk and prophylaxis in the acute hospital care setting (ENDORSE study): a multinational cross-sectional study. :387–94.
4. Nicholson M, Chan N, Bhagirath V, Ginsberg J. Prevention of Venous Thromboembolism in 2020 and Beyond. *J Clin Med*. 2020;9(8):2467.
5. Task A, Members F, Konstantinides S V, Germany C, France MH, Sian C, et al. 2019 ESC Guidelines for the diagnosis and management of acute pulmonary embolism developed in collaboration with the European Respiratory Society (ERS) The Task Force for the diagnosis and management of acute. 2019;1–61.
6. Abah JP, Menanga A, Ngahane BHM, Minkande JZ, Akono MN, Kingue S. Pattern of venous thromboembolic diseases in a resources-limited setting in Cameroon. *Pan Afr Med J*. 2016;23:1–10.
7. Mulatu A, Melaku T, Chelkeba L. Deep Venous Thrombosis Recurrence and Its Predictors at Selected Tertiary Hospitals in Ethiopia : A Prospective Cohort Study. 2020;
8. Heit JA, Spencer FA, White RH. The epidemiology of venous thromboembolism The epidemiology of venous thromboembolism. *J Thromb Thrombolysis*.

- 2016;41(1):3–14.
9. White RH. The Epidemiology of Venous Thromboembolism. 2003;4–8.
 10. Mwandama CK, Andrews B, Lakhi S. Prevalence of deep vein thrombosis and associated factors in adult medical patients admitted to the University Teaching Hospital, Lusaka, Zambia. *Preval Deep vein Thromb Assoc factors adult Med patients Admit to Univ Teach Hosp Lusaka, Zambia.* 2016;43(4):224–30.
 11. Kamdem F, Hugo B, Ngahane M, Hamadou B, Mongyui A, Doualla MS, et al. Epidemiology, Clinical Presentations and In-Hospital Mortality of Venous Thromboembolism at the Douala General Hospital : A Cross-Sectional Study in Cameroon, Sub-Saharan Africa. 2018;42:123–32.
 12. Edeer AD, Comez S, Damar HT, Savci A. Prevalence and risk factors of venous thromboembolism in postoperative patients: A retrospective study. *Pakistan J Med Sci.* 2018;34(6):1539–44.
 13. Nkoke C, Ngueping MJT, Atemkeng F, Teuwafeu D, Boombhi J, Menanga A. Incidence of venous thromboembolism, risk factors and prophylaxis in hospitalized patients in the southwest region of Cameroon. *Vasc Health Risk Manag.* 2020;16:317–24.
 14. Vululi ST, Bugeza S, Zeridah M, Ddungu H, Openy AB, Frank M, et al. Prevalence of lower limb deep venous thrombosis among adult HIV positive patients attending an outpatient clinic at Mulago Hospital. *AIDS Res Ther [Internet].* 2018;15(1):1–8. Available from: <https://doi.org/10.1186/s12981-018-0191-1>
 15. Nkoke C, Teuwafeu D, Mapina A, Nkouonlack C. RESEARCH NOTE A case series of venous thromboembolic disease in a semi-urban setting in Cameroon. *BMC Res Notes [Internet].* 2019;10–2. Available from: <https://doi.org/10.1186/s13104-019-4092-8>
 16. Bertolotti L, Quenet S, Mismetti P, Herna L, Barro M, Tolosa C, et al. Clinical presentation and outcome of venous thromboembolism in COPD . 2012;39(4):862–8.
 17. Spencer FA, Gore JM, Lessard D, Douketis JD, Emery C, Goldberg RJ. Patient Outcomes After Deep Vein Thrombosis and Pulmonary Embolism.

2008;168(4):425–30.

18. Monreal M, Falgá C, Valle R, Barba R, Bosco J. Venous Thromboembolism in Patients with Renal Insufficiency : Findings from the RIETE Registry. 2006;1073–9.
19. Ahmed F, Hussen S, Assefa T. Venous Thromboembolism Risk, Prophylaxis and Outcome in Hospitalized Patients to Medical Wards of University Teaching Hospital. *J Clin Exp Cardiol*. 2019;10(1):13–5.
20. Journal A, Medicine E. Mawasiliano (Correspondence/Correspondance). *African J Emerg Med*. 2016;6(4):209–11.
- 21 Alshahrani S, Alfawzan A, Alswaidan A, Alkharaan A, Alabduljabar M, Khan A, et al. Anatomical sites and clinical characteristics of venous thromboembolism in a tertiary hospital. *J Appl Hematol* 2020;11:126-31.

Annex-II -Data abstraction format

Data abstraction format on the outcomes and associated factors of VTE among hospitalized patients at Tibebe Ghion Specialized Hospital and Felege Hiwot Referral Hospital

I. Socio-Demographic Data

- A. Age1. <40 2.4-60 3.>60
- B. Sex----1.MALE 2. FEMALE
- C. Address .1.RURAL 2. URBAN

II. Type of VTE with Doppler us or chest CT SCAN and side of involvement and Patient presenting

- 1. Proximal LLDVT a. Right b. Left c. Both
- 2. Distal LLDVT a. Right b. Left c. Both
- 3. Upper limb DVT a. Right b. Left c. Both
- 4. PTE at the main pulmonary artery
- 5. PTE at segmental Artery
- 6.. Both DVT and PTE

III. clinical Presentation

- A. Leg pain
- B. Swelling
- C. Local tenderness
- D. Pitting edema
- E. Chest pain

- F. Dyspnea
- G.Cough

IV. Clinical Characteristics

Primary admission diagnosis

- A • Stroke/Paraplegia.....
- B • HIV –AIDS.....
- C • Tuberculosis.....
- D • Malignancy/current chemotherapy.....
- E• Diabetics and diabetic complication.....
- F • Heart failure.....
- G• Renal failure
- H• COPD/ B .Asthma.....
- I • Rheumatologic disease
- K• Gastrointestinal / hepatobiliary disease
- J• Orthopedic surgery/ trauma/fracture.....
- k. Varicose veins / previous VTE
- l. Long-distance travel
- M. Smoking

V. Type of anticoagulation Ordered

- A. Duration of overlapping of warfarin +UFH
- B.LMWH
- Warfarin
- D.Rivaroxaban

VI. Length of Hospital Stay-----

VII. Did he/she develop any of the following complications?

1. Bleeding
2. Heparin-induced thrombocytopenia
3. Post phlebitis Syndrome

VIII. What is the outcome of the patient?

1. Improved
2. Death

