Scientific Research Publishing

World Journal of Cardiovascular Diseases, 2025, 15(4), 179-186
https://www.scirp.org/journal/wjcd
ISSN Online: 2164-5337
ISSN Print: 2164-5329

Prevalence of Venous Thromboembolic Disease in ICU Gabriel Toure University Hospital

Thierno Madane Diop[1*], Moustapha Issa Mangane[1], Abdoul Hamidou Almeimoune[1], Kevin Loic Tchuenkam[1], Fadima Koureïssy Tall[2], Andre Kassogue[1], Alfousseïni Soumare[1], Dramane Sanogo[1], Amadou Gamby[1], Adama Coulibaly[1], Kassoum Ouattara[1], Drissa Kaloga Bagayoko[3], Mahamadoun Coulibaly[3], Baba Fane[4], Alhassane Ba[4], Aladji Seidou Dembele[5], Mahamane Djibo Diango[1]

[1]Department of Anesthesia, Resuscitation and Emergency Medicine, Gabriel Touré University Hospital, Bamako, Mali
[2]Department of Anesthesia, Resuscitation and Emergency, Kati University Hospital, Kati, Mali
[3]Department of Anesthesia, Resuscitation and Emergency, Luxembourg University Hospital, Bamako, Mali
[4]National Blood Transfusion Center (CNTS), Bamako, Mali
[5]Anesthesia Service of the University Hospital of the African Tropical Ophthalmology Institute (IOTA), Bamako, Mali
Email: *madane.diop@gmail.com

How to cite this paper: Diop, T.M., Mangane, M.I., Almeimoune, A.H., Tchuenkam, K.L., Tall, F.K., Kassogue, A., Soumare, A., Sanogo, D., Gamby, A., Coulibaly, A., Ouattara, K., Bagayoko, D.K., Coulibaly, M., Fane, B., Ba, A., Dembele, A.S. and Diango, M.D. (2025) Prevalence of Venous Thromboembolic Disease in ICU Gabriel Toure University Hospital. *World Journal of Cardiovascular Diseases*, **15**, 179-186.
https://doi.org/10.4236/wjcd.2025.154017

Received: March 17, 2025
Accepted: April 21, 2025
Published: April 24, 2025

Abstract

Summary: Deep vein thrombosis (DVT) and pulmonary embolism (PE) are two entities of venous thromboembolism (VTE) whose incidence is difficult to assess. **Objective:** This paper aims to evaluate the prevalence of venous thromboembolism. **Patients and Methods:** This was a descriptive cross-sectional study with prospective collection, over 12 months from May 1, 2023 to April 30, 2024**. Results:** We admitted 627 patients including 6 cases of VTE, with a prevalence of 096%. The average age was 49.67 ± 17.58 years with extremes of 30 to 71 years, the sex ratio 0.2, and housewives represented 33.3%. The transient risk factors (FDR) were prolonged immobilization ≥ 05 days (05 cases) 83.3%, major surgery (01 case) 16.7%, spinal cord trauma (01 case) 16.7%, central venous catheter (04 cases) 66.6%; the permanent risk factors (FDR) were obesity (04 cases) 66.6%, age (3 cases) 50%, high blood pressure (hypertension) (3 cases) 50%, cancer (01 case) 16.7%. The main clinical signs were dyspnea (100%), tachycardia (33.3%), chest pain (33.3%), and Homans sign with increased local heat (01 cases) 16.7%. The diagnoses retained were PE (04 cases) 83.3%, PE + DVT (01 case) 16.7% and DVT (01 case) 16.7%. All patients were placed on oxygen therapy, (02 cases) intubated and ventilated, (02 cases) High Flow Oxygenation, (02 cases) on amines such as dobutamine + norepinephrine and norepinephrine alone (83.3%) of patients were placed on direct oral anticoagulants (DOACs) and 16.7% on low molecular weight heparin (LMWH). The average length of stay was 7.3 ± 3.33 days with ex-

tremes of 4 to 13 days and the lethality of (03 cases) 50% of which (02 cases) had sPESI ≥ 2. **Conclusion:** The diagnosis and management of VTE remains difficult and responsible for significant morbidity and mortality.

Keywords

Venous Thromboembolic Disease, ICU, Gabriel Touré University Hospital, Mali

1. Introduction

Venous thromboembolic disease (VTE) is a nosological group that mainly includes deep vein thrombosis (DVT) and pulmonary embolism (PE). Indeed, between 70% and 80% of PEs are complications of deep vein thrombosis of the lower limbs [1]. The incidences are quite inhomogeneous between these different countries, ranging from 0.48 to 1.60 events/1000; they vary with age and can reach 5/1000 after 75 years [2]. In studies conducted in Benin, Cameroon, Ivory Coast and Mali, the hospital prevalence was 8.3%; 1.6%; 0.95%; 4.95% [3]-[6]. The often difficult diagnosis, the significant morbidity and mortality with medium and long-term sequelae make it a public health problem. This led us to initiate this work which aimed to determine the prevalence of VTE and to identify the different risk factors (FDR) responsible for thromboembolic events in patients in the Intensive Care Unit.

2. Patients and Methods

This is a descriptive study over a period of 1 year with prospective data collection from May 1, 2023 to April 30, 2024. This study took place in the Intensive Care Unit of the Gabriel Toure University Hospital in Bamako and covered all the files of patients of both sexes and all ages hospitalized for the managment of a medical or surgical pathology.

2.1. Inclusion Criteria

The study included all patients, regardless of age and sex, who presented: For deep vein thrombosis (DVT), suggestive clinical signs (redness, edema, pain in the leg or calf) and confirmed by venous Doppler ultrasound of the lower limbs; For pulmonary embolism (PE), suggestive clinical signs (tachypnea, tachycardia, chest pain, and, in more severe cases, hypotension) confirmed by spiral CT angiography; Patients were included if these signs were present upon admission or developed during their hospitalization.

2.2. Non-Inclusion Criteria

Patients who presented clinical signs suggestive of deep vein thrombosis (DVT) (redness, edema, pain in the leg or calf) and whose Doppler ultrasound of the limb

vessels returned normal were not included in the study; for pulmonary embolism (PE), patients who presented signs (tachypnea, tachycardia, chest pain and, in more severe cases, hypotension) but whose spiral CT angiography returned normal.

2.3. Operational Definition

- Tachycardia was defined as a heart rate greater than 100 beats per minute.
- Polypnea was defined as a respiratory rate greater than 20 cycles per minute.
- Lower limb edema (LLE) is an increase in the volume of one or both legs, in part or in whole.
- We considered confirmed cases of lower limb venous thrombosis to be: patients who presented clinical signs suggesting lower limb thrombosis with confirmation by ultrasound of the limb vessels.
- We considered as confirmed cases of pulmonary embolism patients with positive CT angiography confirming pulmonary embolism.

2.4. Data Collection and Processing

Data were collected from survey forms and medical records. Data collection and analysis were conducted using SPSS version 25.0 software. Tabulation was performed using Microsoft Office Excel 2016. Word processing was performed using Microsoft Office Word 2016.

2.5. Ethical Considerations

We have requested and obtained patient consent and/or the assent of their companions and dependents, and we have guaranteed the confidentiality of the information collected.

3. Results

We admitted 627 patients, including 6 cases of venous thromboembolic disease (VTE), giving an overall hospital prevalence of 0.96% and a specific prevalence of isolated pulmonary embolism (PE) and the association of pulmonary embolism (PE) and deep vein thrombosis (DVT) were 0.64% and 0.16%, respectively. The mean age was 49.67 ± 17.58 years, ranging from 30 to 71 years, and the sex ratio was 0.2 (**Figure 1**), with a female predominance. Housewives accounted for 33.3%.

The transient risk factors were prolonged immobilization ≥ 05 days (05 cases) 83.3%, major general surgery (01 case) 16.7%, spinal cord injury (01 case) 16.7%, central venous catheter (04 cases) 66.6% including 03 approaches in the femoral position. The permanent risk factors were obesity (04 cases) 66.6%, age (3 cases) 50%, high blood pressure (HTA) (3 cases) 50%, cancer (01 case) 16.7% (**Table 1**).

The main clinical signs were dyspnea 100%, tachycardia 33.3% and chest pain 33.3%, Homans sign + increased local heat (01 case) 16.7% (**Table 2**).

The diagnoses retained were pulmonary embolism (PE) alone (04 cases) 83.3%, deep vein thrombosis (DVT) alone (01 case) 16.7% and the association PE + DVT

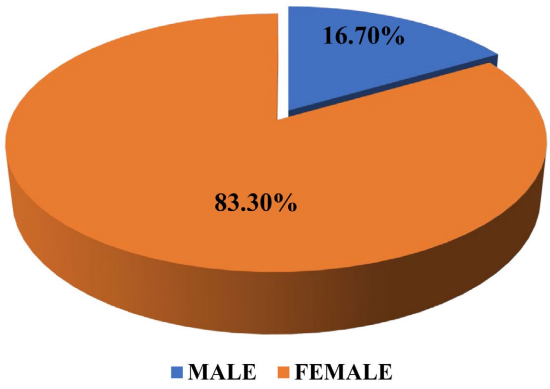

Figure 1. Distribution by gender.

Table 1. Distribution according to risk factors.

Risk factors	Workforce	Percentage (%)
Transients		
Prolonged immobilization ≥ 5 days	5	83.3
Major general surgery	1	16.7
Spinal cord injury	1	16.7
Permanent		
Diabetes	1	16.7
Obesity	4	66.6
Age ≥ 55 years	3	50
History of stroke	1	16.7
high blood pressure	3	50
Cancer	1	16.7
Acquired in intensive care		
Mechanical ventilation	4	66.6
Central venous catheter	4	66.6
Vasopressor treatment	2	33.3

Table 2. Distribution according to clinical signs.

Clinical signs	Workforce	Percentage (%)
Deep vein thrombosis (DVT)		
Homans Sign + Increase in Local Heat	1	50
One-sided IMO	1	50
Pulmonary embolism (PE)		
Chest pain	2	33.3
Polypnea	5	100
Tachycardia	2	33.3

(01 case) 16.7% (Figure 2).

On imaging, the obstruction of the pulmonary artery was bilateral in (03 cases) 60% (Table 3).

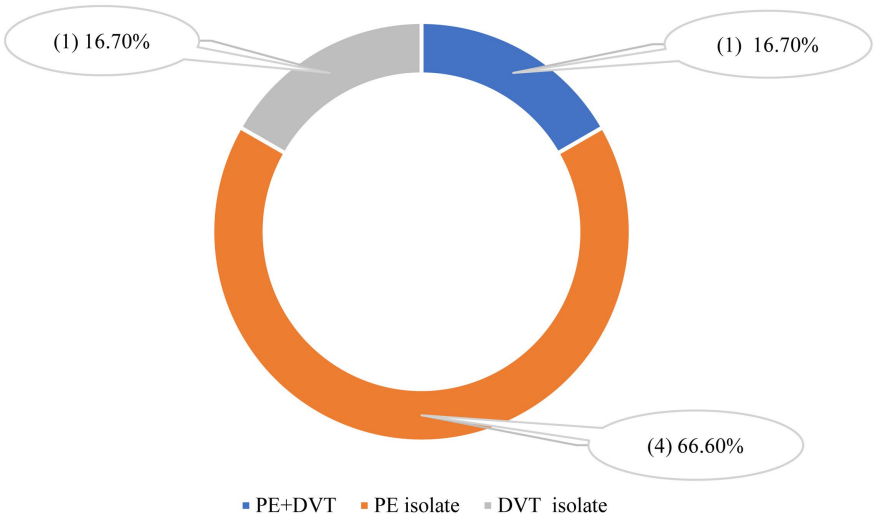

Figure 2. Patient distribution by lesion type.

Table 3. Distribution according to the location of the thrombus on CT angiography.

Thrombus location on CT angiography	Workforce	Percentage (%)
Proximal pulmonary arteries	1	20
Bilateral obstruction	3	60
Branches of subsegmental divisions of the AP arteries	1	20
Total	**5**	**100**

Table 4. Distribution according to the evolution according to the PESI score.

sPESI	Evolution under treatment		Total
	Favorable	unfavorable	
1	1	1	2
2	0	1	1
3	1	0	1
4	0	1	1
Total	**2**	**3**	**5**

In addition to general resuscitation measures, all patients were placed on simple oxygen therapy with a simple mask. High-flow oxygenation (HFO) was initiated in (02 cases) and 02 patients were intubated and ventilated. Vasopressor amines such as dobutamine + noradrenaline and noradrenaline alone were initiated in (02 cases). For anticoagulant treatment, 83.3% of patients were placed on direct

oral anticoagulants (DOACs) and 16.7% on low molecular weight heparin (LMWH). The average length of stay was 7.3 ± 3.33 days with extremes of 4 to 13 days and the case fatality of (03 cases) 50% of which (02 cases) 66.67% had sPESI ≥ 2 (**Table 4**).

4. Discussion

The prevalence of venous thromboembolic disease was 0.96% this result is close to that of Bertrand *et al.* [5] in Ivory Coast 0.95% and is lower than those of Denakpo *et al.* in Benin [3] 8.3%, Owono Etoundi *et al.* [4] in Cameroon 1.6%, Coulibaly *et al.* [6] in Mali 4.95%; our result can be explained by the fact that the diagnosis of (PE) is difficult despite the progress of diagnostic means, these difficulties are reported in the literature found in the literature [7] [8]. The average age of the patients was 49.67 ± 17.58 years this result is close to that by Owono Etoundi *et al.* [4] in Cameroon, Coulibaly *et al.* and Menta *et al.* [9] in Mali who found respectively 50.61 ± 25 years, 54 ± 17.79 years and 46.46 ± 21 years. The incidence of venous thromboembolic events increases with age, which is an independent thromboembolic risk factor. This risk is all the more important as there is an increased incidence of associated comorbidities (surgical interventions, immobility, or cancer) with age [10]. The sex ratio of 0.2 with a female predominance is found in studies [4] [6] [11] [12].

Prolonged bed rest was the most frequently found risk factor 83.3% followed by central venous catheter 66.6% and obesity 66.6%. Obesity and prolonged bed rest are found in the literature as risk factors for VTE [13]-[15]. The predominant clinical manifestations of DVT were inflammatory edema associated with positive Homans sign 50% this result is close to that of Menta *et al.* in Mali [9] the literature confirms that edema of the lower limbs is the sign of DVT [16]. Dyspnea was the symptom of PE 100% of cases this result is similar to Coulibaly *et al.* in Mali [6]. The diagnoses retained were pulmonary embolism alone 83.3%, pulmonary embolism and deep vein thrombosis 16.7% and deep vein thrombosis alone 16.7%. The anticoagulant treatment was based on direct oral anticoagulants (DOAC) 83.3% mainly in accordance with the recommendations of the literature [16] [17]. The average length of stay 7.3 ± 3.3 days with extremes of 4 to 13 days, mortality of (03 cases) 50%, of which (02 cases) 66.67% had sPESI ≥ 2 this relationship PESI score.

5. Conclusion

The diagnosis and management of venous thromboembolic disease remains difficult. The female sex was the most affected, with prolonged bed rest as the main risk factor. The evolution remains marked by a significant morbidity mortality.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Caillard, G. and Clerel, M. (2001) Travel and Risk of Venous Thrombosis. *The Lancet*, **357**, 554-555. https://doi.org/10.1016/s0140-6736(05)71698-6

[2] Oger, E., Lacut, K. and Scarabin, P.Y. (2002) Thrombose veineuse profonde: Épidemiologie, facteurs de risque acquis. *Annales de Cardiologie et d'Angéiologie*, **51**, 124-128. https://doi.org/10.1016/s0003-3928(02)00083-5

[3] Djénakpo, J.L., Zoumènou, E., Kérékou, A., Dossou, F., Hounton, N., Sambiéni, O., *et al*. (2012) Fréquence et facteurs de risque de la maladie thromboembolique veineuse chez la femme en milieu hospitalier à Cotonou, Benin. *Ashdin Publishing Clinics in Mother and Child Health*, **9**, Article ID: C120202. https://doi.org/10.4303/cmch/C120202

[4] Owono Etoundi, P., Esiéne, A., Bengono Bengono, R., Amengle, L., Afane Ela, A. and Ze Minkande, J. (2015) La Maladie Thromboembolique Veineuse. Aspects Épidémiologiques et Facteurs de Risque dans un Hôpital Camerounais. *Health Sciences and Disease*, **16**, 1-4.

[5] Bertrand, E., Charle, D., Chouvet, J., Coulibaly, A.O., *et al*. (1979) Précis de pathologie cardiovasculaire Tropicale, de la rareté de la pathologie thrombo-embolique en région tropicale. Paris Sandoz.

[6] Coulibaly, S., Menta, I., Diall, I.B., *et al*. (2018) Maladie Thromboembolique Veineuse dans le Ser-vice de Cardiologie du CHU du Point G à Bamako. *Health Sciences and Disease*, **19**, 27-30.

[7] Germini, F., Zarabi, S., Eventov, M., Turcotte, M., Li, M. and de Wit, K. (2021) Prévalence de l'embolie pulmonaire parmi les cohortes des services d'urgence: Revue systématique et méta-analyse. *Journal of Thrombosis and Haemostasis*, **19**, 173-185. https://doi.org/10.1111/jth.15124

[8] Zarabi, S., Chan, T.M., Mercuri, M., Kearon, C., Turcotte, M., Grusko, E., *et al*. (2021) Physician Choices in Pulmonary Embolism Testing. *Canadian Medical Association Journal*, **193**, E38-E46. https://doi.org/10.1503/cmaj.201639

[9] Menta, I., Ba, H.O., Coulibaly, S., *et al*. (2019) Venous Thromboembolism in Hospitalization in the Cardiology Department of University Hospital Gabriel Toure. *Archives of Cardiology and Cardiovascular Diseases*, **2**, 1-7.

[10] Mahé, I., Caulin, C. and Bergmann, J.-F. (2005) L'âge, un facteur indépendant de risque de thrombose. *La Presse Médicale*, **34**, 878-886. https://doi.org/10.1016/s0755-4982(05)84068-0

[11] Chalal, N. and Demmouche, A. (2013) Maladie thromboembolique veineuse dans la région de Sidi Bel Abbes, Algérie: Fréquence et facteurs de risque. *Pan African Medical Journal*, **16**, Article 45. https://doi.org/10.11604/pamj.2013.16.45.2620

[12] Samama, M.M., Cohen, A.T., Darmon, J., Desjardins, L., Eldor, A., Janbon, C., *et al*. (1999) A Comparison of Enoxaparin with Placebo for the Prevention of Venous Thromboembolism in Acutely Ill Medical Patients. *New England Journal of Medicine*, **341**, 793-800. https://doi.org/10.1056/nejm199909093411103

[13] Bernasconi, F., Estrade, G., Garnier, D. and Donatien, Y. (1988) Aspect actuel de la maladie thromboembolique en Martinique à propos de 46 cas. *Caraïbes Medical*, **24**, 160-165.

[14] Heit, J.A., Silverstein, M.D., Mohr, D.N., Petterson, T.M., O'Fallon, W.M. and Melton, L.J. (2000) Risk Factors for Deep Vein Thrombosis and Pulmonary Embolism. *Archives of Internal Medicine*, **160**, 809-815. https://doi.org/10.1001/archinte.160.6.809

[15] Isma, N., Svensson, P.J., Gottsäter, A. and Lindblad, B. (2009) Prospective Analysis of Risk Factors and Distribution of Venous Thromboembolism in the Population-Based Malmö Thrombophilia Study (MATS). *Thrombosis Research*, **124**, 663-666. https://doi.org/10.1016/j.thromres.2009.04.022

[16] Bergqvist, D. (1983) Frequency of Thromboembolic Complications. In: Bergqvist, D., Ed., *Postoperative Thromboembolism*, Springer, 6-34. https://doi.org/10.1007/978-3-642-68863-8_2

[17] Kahn, S.R. and de Wit, K. (2022) Pulmonary Embolism. *New England Journal of Medicine*, **387**, 45-57. https://doi.org/10.1056/nejmcp2116489