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Research Article

Associated Factors to Pulmonary Embolism Lethality in a Sub-Saharan African Country: Case of the Cardiology Department of the Yalgado Ouedraogo University Hospital

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Abstract

Introduction: Third cause of cardiovascular mortality worldwide, pulmonary embolism (PE) is a diagnostic and therapeutic emergency. The main objective of this study was to determine the factors associated with the lethality of PE in the Cardiology department of the Yalgado OUEDRAOGO University Hospital Center (CHU-YO) from 2015 to 2019. Methodology: The study was descriptive with an analytical aim by retrospective collection of data on the clinical observations of hospitalized patients. *Results:* The hospital proportion of PE in our series was 9.7%. The sex ratio (M/F) was 0.63. The average age was 50.41 years. The first three permanent thromboembolic risk factors were age greater than or equal to 65 years (23.2%), HIV infection (7.7%) and history of venous thromboembolic disease (7.4%). The most found transient thromboembolic risk factor was obesity (29.6%). Chest pain (77.2%) and dyspnea (76.8%) were the most common symptoms. The most common electrical anomaly was subepicardial ischemia at the level of the right precordials ((in V1: 29.9%, in V2: 28.3%) and the echocardiographic one was pulmonary hypertension (33.76%). Bilateral distribution and segmental location of thrombi in the pulmonary arterial tree were the most found with respectively 66.2% and 44.1%. Thrombolysis was performed in 5.8% of patients. The most commonly used oral anticoagulant was fluindione (72.3%). Hospital lethality was 6.1%. Survival in women (71.8%) was lower than in men (73.1%) but without statistically significant difference (p-Value=0.4). The risk factors associated with the lethality of pulmonary embolism in the Cardiology Department of the Yalgado OUEDRAOGO University Hospital Center from 2015 to 2019 were age over 65 ((ORa=4 .41; 95% CI= [1.08; 17.9]); incomplete right bundle branch block (ORa=6.09; 95% CI= [1.15; 32.35]); chronic obstructive pulmonary disease ((ORa=9.18; 95% CI= [1.02; 83.03]). The only protective factor was VKA overdose ((ORa=0.09; 95% CI= [0.01; 0.83]). Conclusion: Among the associated factors identified in this study, 2 out of 4 can be targets for public health's actions. These are the INR target and chronic obstructive pulmonary disease. To reduce the lethality of PE in our context, we suggest upstream to continue and intensify the fight against smoking, this major provider of chronic obstructive pulmonary disease, and downstream to define by cohort studies, the most important INR target effective in terms of reducing mortality from pulmonary embolism in Burkina Faso.

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Keywords

Pulmonary Embolism, Lethality, Associated Factors, Therapeutic Target, Smoking, Burkina Faso

1. Introduction

Pulmonary embolism (PE) constitutes, along with deep vein thrombosis (DVT), the two components of venous thromboembolic disease (VTE) [1]. It is defined as the sudden obliteration (total or partial) of the trunk of the pulmonary artery or one of its branches by a circulating embolus, most often fibrino-cruoric [2].

PE is the third leading cause of cardiovascular mortality after coronary artery disease and stroke worldwide [2, 3]. It is a diagnostic and therapeutic emergency because of its high lethality, which is 25 to 30% when left untreated and 2 to 8% when diagnosed and treated early [1, 4]. In Burkina Faso, the hospital case fatality rate for pulmonary embolism in 2015 was 8.48% [5].

The main objective of this study was to determine the factors associated with PE lethality in the Cardiology Department of the Yalgado OUEDRAOGO University Hospital Center (CHU-YO) from 2015 to 2019 in order to improve the prognosis of PE in our structure.

2. Methodology

2.1. Study Design

The study was cross-sectional, descriptive with an analytical aim by retrospective collection of data on the clinical observations of patients hospitalized in the cardiology department of the CHU-YO in Ouagadougou, Burkina Faso.

A secondary analysis of the same database wich provided a previous article; Nobila Valentin Yameogo et al. Influence of seasonal variations on admissions and deaths of pulmonary embolism in the Cardiology Department of the Yalgado Ouedraogo University Hospital Center, Ouagadougou, Burkina Faso. PAMJ-One Health. 2023; 12: 6. [doi: *10.11604/pamj-oh.2023.12.6.40945*].

2.2. Frame Work

Burkina Faso is a landlocked country in West Africa [6-8]. This low-income country has a two-season intertropical climate, a rainy season (June to September) and a dry season (October to May) [6-8].

The Yalgado Ouédraogo Hospital, the first level III university hospital in the capital, the CHU-YO remains a reference hospital to this day. Of the many medical-surgical specialties that are there, there is the Cardiology department. With its capacity of 27 hospital beds, including 4 beds dedicated to cardiology intensive care, the Cardiology Department of the CHU-YO remains a reference in the management of cardiovascular diseases in Ouagadougou.

2.3. Study Population

The study population included all patients admitted to the cardiology department of the CHU-YO for pulmonary embolism from January 1, 2015 to June 30, 2019.

2.4. Inclusion and Exclusion Criterias

The only inclusion criteria in the study was confirmation of pulmonary embolism by chest CT angiography or ventilation lung scintigraphy – perfusion.

The criteria for exclusion from the study were unusable or incomplete or unfound records.

2.5. Data Collection

The data collection used a survey sheet as a collection tool. The medium of this collection tool was paper. The variables collected were sociodemographic, clinical, paraclinical, therapeutic and evolutionary modalities.

Data collection was done by using clinical files and outpatient consultation sheets

Data entry was done with Excel software.

2.6. Statistical Analysis

The statistical analysis of the data was carried out using the statistical analysis software Rstudio version 4.0.2.

It consisted of a descriptive analysis of the qualitative and quantitative variables.

The survival analysis used Kaplan Meier's method to calculate the survival curve for males and females using the occurrence of death as an event. The duration of follow-up was retrospectively set at 50 days for each patient starting with the day of admission. This retrospective follow-up of each patient was made possible thanks to clinical hospitalization records and outpatient consultation sheets in the event of no death during hospitalization.

Bivariate analysis was used to compare two unmatched variables. The objective was to look for a statistically significant

relationship between the two variables. This relationship was retained as statistically significant for a p-Value < 0.05. It was sought with the appropriate statistical test according to its conditions of applicability.

In multivariate analysis, only explanatory variables with a p-value ≤0.25 in bivariate analysis were retained. The dependent variable of interest was "death." It was a binomial logistic regression for explanatory purposes. We had proceeded in 2 different ways to determine the parsimonious model: the automatic upward stepping method and the automatic stepwise method.

2.7. Ethics

With regard to the ethical framework, the study had been authorised by the head of the department and the survey sheets were anonymous.

3. Results

3.1. Descriptive Results

3.1.1. Proportion of PE

During our study period, 311 cases of pulmonary embolism were collected out of 3205 patients admitted to cardiology, a proportion of 9.7%.

3.1.2. Socio-demographic Characteristics

In our series, the majority of patients came from an urban area (82.6%). Our study population was predominantly female (61.1%) with a sex ratio (F/M) of 0.6. The mean age was 50.4 years ± 15.8 years with extremes of 16 and 85 years. The average age of women was 49.4 years ± 15.9 years and that of men was 51.9 years ± 15.9. There was no statistically significant difference (p-Value = 0.67).

3.1.3. Cardiovascular Risk factors

In our series. 112 patients (36.0%) had hypertension (hypertension) (Table 1). Diabetes was found in 23 patients (7.4%) (Table 1). Smoking affected 23 patients. or 7.4% of cases. It was more prevalent in men with a proportion of 87.0% (Table 1). The measurement of the body mass index (BMI) had made it possible to note obesity in 29.6% of cases. It predominated among females (89.5%) (Table 1).

Table 1. *Distribution by cardiovascular risk factors of patients hospitalized for pulmonary embolism at the Cardiology Department of the Yalgado Ouedraogo University Hospital from 2015 to 2019. N = 311.*

	N	%
Tobacco	23	7.4
Obesity	92	29.6
Arterial high blood pressure	112	36.0
Diabetes	23	7.4

3.1.4. Venous Thromboembolic Risk Factors

(i). Permanent Venous Thromboembolic Risk Factors (Non-Reversible)

The first three permanent VTRDFs found during the study were. in order of decreasing frequency: age greater than or equal to 65 years (23.2%), HIV infection (7.7%) and history of VTE (7.4%) (Figure 1).

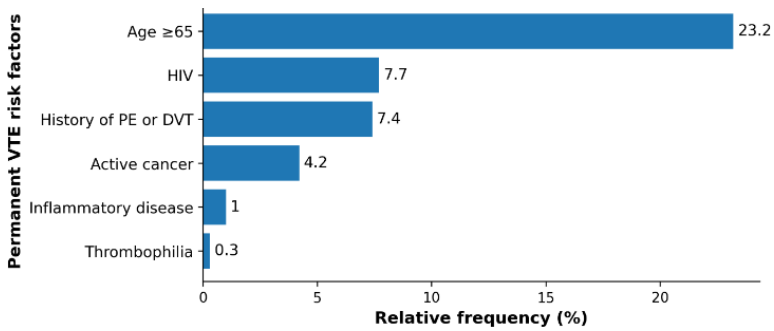

Figure 1. *Distribution according to permanent (non-reversible) thromboembolic risk factors of patients hospitalized for pulmonary embolism in the Cardiology Department of the Yalgado OUEDRAOGO University Hospital from 2015 to 2019. N = 311.*

(ii). Transient or Reversible Venous Thromboembolic Risk Factors

The first three transient EVDRFs found during the study were. in order of decreasing frequency: obesity (29.6%). prolonged

bed rest (19.9%) and acute medical pathology (16%) (Figure 2).

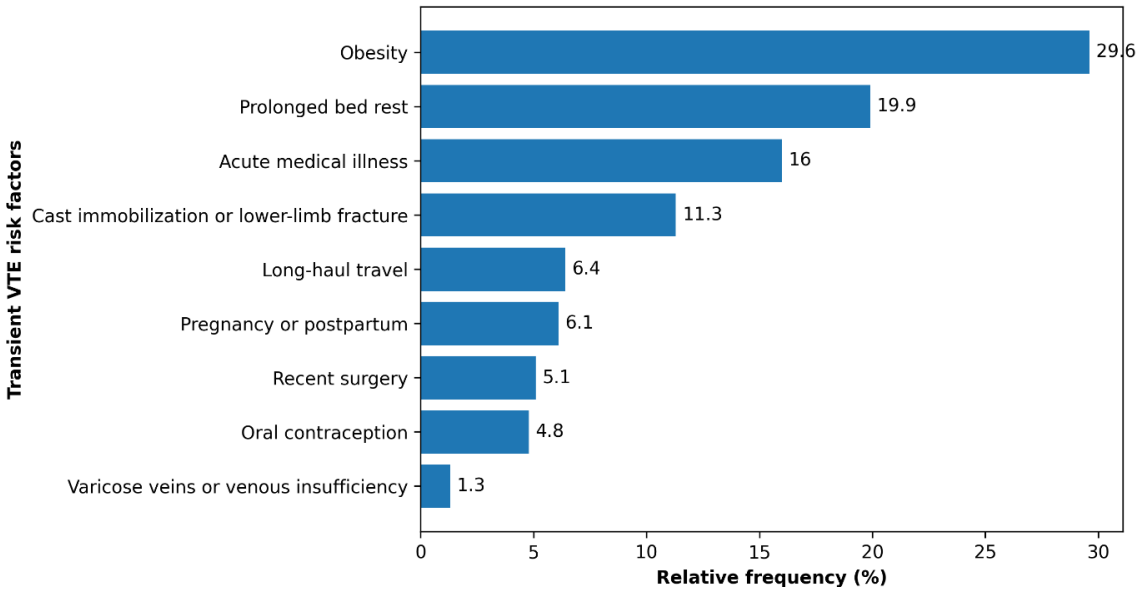

Figure 2. *Distribution according to transient or reversible thromboembolic risk factors of patients hospitalized for pulmonary embolism in the Cardiology Department of the Yalgado OUEDRAOGO University Hospital from 2015 to 2019. N = 311.*

3.1.5. Clinical aspects

Admission procedures: In our series. 59% of patients were admitted to cardiology by a transfer from a third-party service of the CHUYO (the medical emergency department most often). compared to 41% by direct admission.

The mean time from the onset of symptomatology to admission to the ward: The mean time to admission to cardiology compared to the onset of symptomatology was 11.9 days. The minimum was one (01) day and the maximum was 90 days.

Functional and general signs: Chest pain and/or dyspnea were the telltale symptoms in 77.2% and 76.8% respectively (Figure 3).

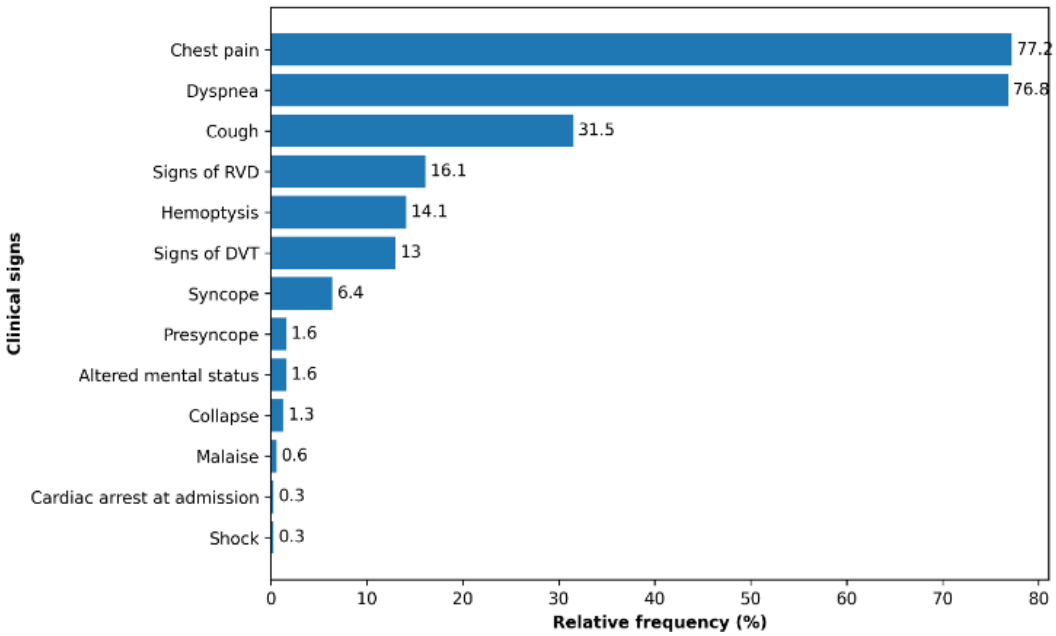

Figure 3. *Distribution according to clinical signs in patients hospitalized for pulmonary embolism in the Cardiology Department of the Yalgado OUEDRAOGO University Hospital from 2015 to 2019. N = 311.*

3.1.6. Biological Aspects

In our series. not all patients were able to perform all the laboratory tests. Table 2 summarises the distribution of patients according to the laboratory tests carried out and the results.

Table 2. *Distribution according to the biological tests performed and the results in patients hospitalized for pulmonary embolism in the Cardiology Department of the Yalgado OUEDRAOGO University Hospital from 2015 to 2019. N = 311.*

Parameters	%	Number of patients who performed the examination
Blood Typing (ABO)		145
Non-O group	73.5	
Hemoglobin Electrophoresis		124
Presence Hb S	21.8	
Glycemia		268
Hyperglycemia	23.2	
Ionogram		271
Ionic disorders	56.8	
Blood count		309
Anemia	38.3	
Polycythemia	1.0	
Leukocytosis	24.8	
Thrombocytosis	9.0	
Thrombocytopenia	8.0	
Creatinine		301
High	15.9	
Transaminases		99
High	47.5	
Troponin		95
High	29.5	
PSA		48
High	22.9	
HIV		211
Positive	11.4	

3.1.7. Paraclinical Aspects for the Positive Diagnosis

(i). Electrocardiogram

The electrocardiogram was performed in the entire population. 81.4% were abnormal.

The most common abnormalities were sinus tachycardia (29.6%) and anterior subepicardial ischemia (in V1: 29.9%. in V2: 28.3%. in V3: 23.1%) (Table 3).

Table 3. *Distribution by electrocardiographic signs of patients hospitalized for pulmonary embolism in the Cardiology Department of the Yalgado OUEDRAOGO University Hospital from 2015 to 2019. N = 311.*

	N	%
Normal EKG	58	18.6
Sinus tachycardia	92	29.6
S1Q3T3	59	18.9
Right atrial hypertrophy	16	5.1
Right ventricular hypertrophy	7	2.2
Right axial deflection	10	3.2
Incomplete right bundle branch block	24	7.7
Full right branch block	8	2.6
Subepicardial lesion in V1	3	0.9
Subepicardial lesion in V2	5	1.6
Subepicardial ischemia in V1	93	29.9
Subepicardial ischemia in V2	88	28.3
Subepicardial ischemia in V3	72	23.1

(ii). Transthoracic Echocardiography

Transthoracic echocardiography was performed in the entire population. The most common abnormality was pulmonary hypertension (33.8%) (Table 4).

Table 4. *Distribution according to echocardiographic results of patients hospitalized for pulmonary embolism in the Cardiology Department of the Yalgado OUEDRAOGO University Hospital from 2015 to 2019. N = 311.*

	N	%
Low LVEF	28	9.0
Abnormal PASP	105	33.8
PH		
Important	58	50.4
Average	39	33.9
Moderate	18	15.6
Thrombus or contrast in the right cavities	4	1.3
Right ventricular dysfunction	6	1.9
Dilation of straight cavities	96	30.9

(iii). Computed Tomography

Computed tomography (CT) and ventilation lung scintigraphy – perfusion were used for the positive diagnosis of PE in 99% and 1% of patients. respectively. (2 pregnant women).

The average time to complete these examinations was 11.4 days with extremes of 0 and 98 days.

The location of thrombi in the pulmonary arterial tree on thoracic CT angiography was bilateral (66.2%) and segmental (44.1%) (Table 5).

Table 5. *Distribution by thoracic CT angiography of patients hospitalized for pulmonary embolism at the Cardiology Department of the Yalgado Ouedraogo University Hospital from 2015 to 2019. N = 311.*

	N	%
Billateral	206	66.2
Unilateral Left	32	10.3
One-sided right	73	23.5
Truncular	55	17.7
Lobar	80	25.7
Segmental	137	44.1
Subsegmental	93	29.9
Proximal	40	12.9
Distal	28	9.0
Partial obstruction	3	0.9
Complete obstruction	1	0.3
Lung damage	175	56.3

(iv). Paraclinical Aspects for Etiological Diagnosis

Venous Doppler ultrasound of the lower limbs was performed in 176 patients; venous thrombosis was found in 19% of them and venous insufficiency in 5.5%.

Abdominal-pelvic ultrasound was performed in 200 patients (64.3%) and had objectified abnormalities in 30 patients. i.e. 15% of cases. Abnormalities were dominated by uterine myoma and prostatic hypertrophy with 16 and 10 patients. respectively (Figure 4).

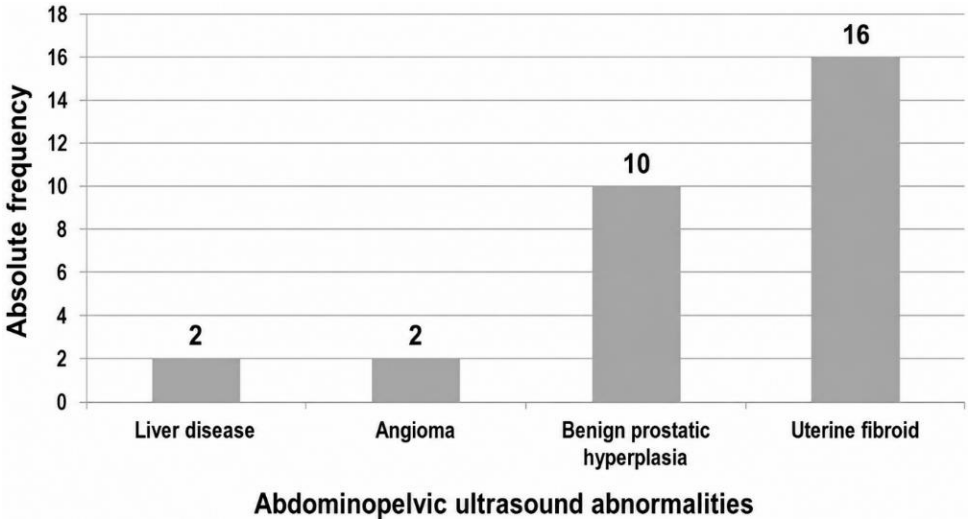

Figure 4. *Summary of abdominal-pelvic ultrasound abnormalities of patients hospitalized for pulmonary embolism in the Cardiology Department of the Yalgado OUEDRAOGO University Hospital from 2015 to 2019. N = 30.*

3.1.8. Therapeutic Modalities

Thrombolysis was performed in 5.8% of patients (Table 6). The most commonly used oral anticoagulant was fluindione at 77.3% (Figure 5). 89 patients had an overdose to VKA and 7 had an accident to VKA.

Table 6. *Summary of therapeutic modalities in patients hospitalized for pulmonary embolism at the Cardiology Department of the Yalgado OUEDRAOGO University Hospital from 2015 to 2019. N = 311.*

	N	%
Oxygenotherapy	130	41.8
LMWH	311	100.0
Anticoagulant	291	93.6
Thrombolysis	18	5.8
Analgesic	173	55.6

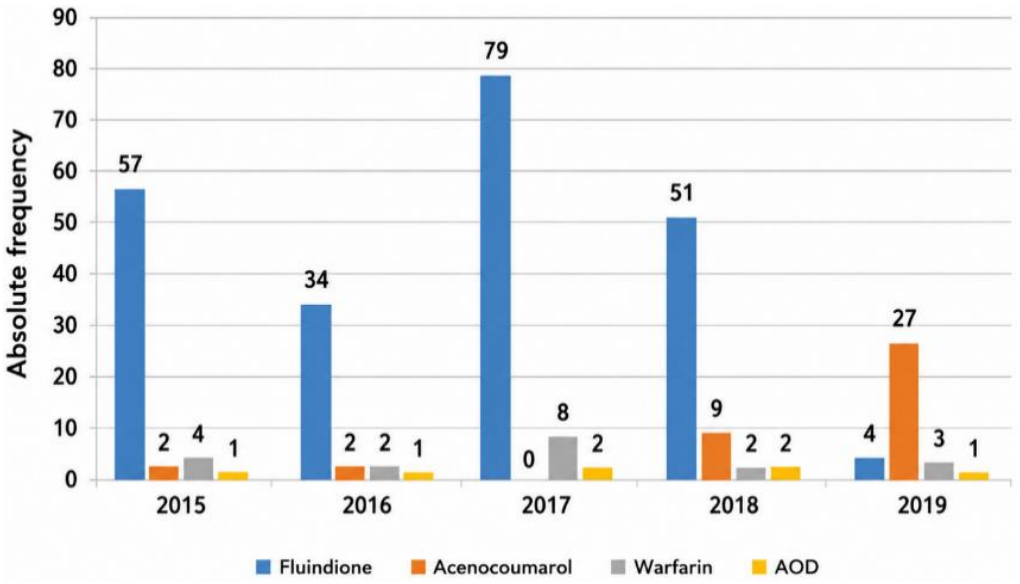

Figure 5. *Summary of the use of oral anticoagulants in the treatment of patients hospitalized for pulmonary embolism at the Cardiology Department of the Yalgado OUEDRAOGO University Hospital from 2015 to 2019. N = 311.*

3.1.9. Hospital Evolution

On a 50-day follow-up of each patient from the date of admission of each:

The mean length of hospital stay was 11.3 ± 6.4 days with extremes of 0 and 49 days. For both men and women. the median length of hospital stay was 10 days. In women. the extremes ranged from 0 to 49 days of hospitalization and in men it was from 4 to 33 days.

In our series. the hospital case fatality rate for pulmonary embolism was 6.1% (19/311). By sex. it was 7.4% in men compared to 5.3% in women with no statistically significant difference (p-Value = 0.47).

The first occurrence(s) of death were observed in males on the^{3rd} day of hospitalization and in females on the same day of admission (Figure 6).

The occurrence of death became zero beyond the 29th day of hospitalization for women and beyond the 25th day for men. At the end of the 49-day follow-up. survival in females (71.8%) was lower than in males (73.1%) but without statistically significant difference (p-Value=0.4) (Figure 6).

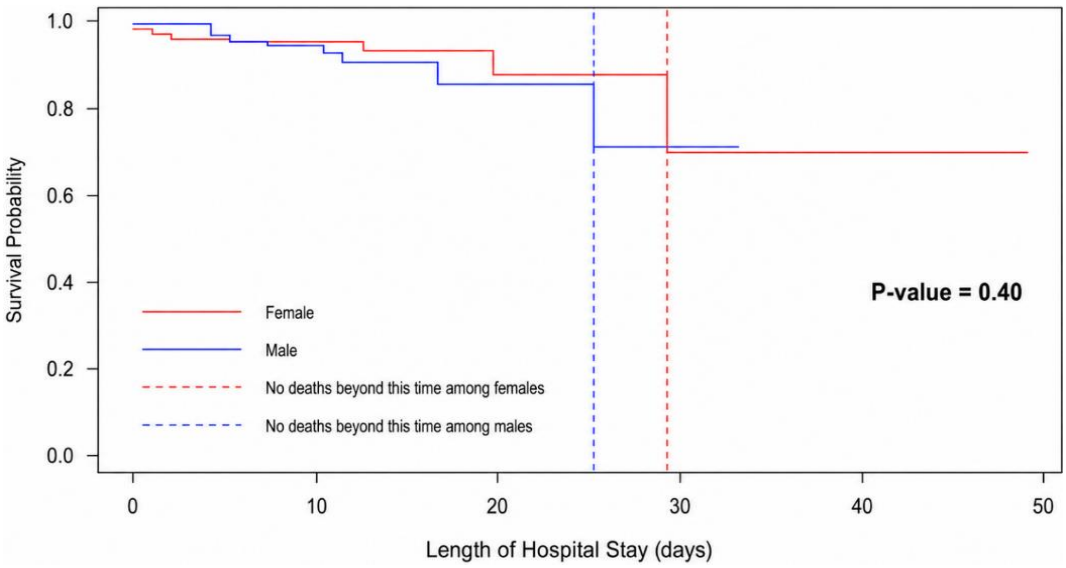

Figure 6. *Male vs. female survival curves hospitalized for pulmonary embolism in the Cardiology Department of the Yalgado OUEDRAOGO University Hospital from 2015 to 2019. N = 311.*

3.2. Factors Associated with the Lethality of Pulmonary Embolism in Our Context

In bivariate analysis. the independent variables that showed a statistically significant relationship with the occurrence of death were: VKA overdose (p-Value=0.039), Thrombolysis (p-Value= 0.003), COPD (p-Value= 0.018), Blood creatinine (p-Value=0.004), Syncope (p-Value= 0.026), Right heart failure (p-Value= 0.005).

In multivariate analysis by binary logistic regression. we obtained the same parsimonious model with both methods. This model was well calibrated (p-Value = 0.9920 in the Hosmer Lemeshow calibration test) with a lack of collinearity between its explanatory variables and with an acceptable discriminatory capacity (AUC = 0.7968).

Four variables were factors associated with the lethality of pulmonary embolism in the Cardiology Department of the Yalgado Ouedraogo University Hospital Center from 2015 to 2019. Riskfactors were for age. incomplete right bundle branch block. and chronic obstructive pulmonary disease. The only protective factor was VKA overdose.

Subjects aged 65 years and older had a 4.41 times greater risk of death from their pulmonary embolism than subjects younger than 65 years of age (ORa=4.41; $^{95\%}$ CI = [1.08. 17.9]; p-Value=0.038) (Table 7).

Subjects with incomplete right bundle branch block on the electrocardiogram had a 6.09 times greater risk of death from their pulmonary embolism than subjects without pulmonary embolism (ORa=6.09; $^{95\%}$ CI = [1.15. 32.35]; p-Value=0.034) (Table 7).

Subjects with chronic obstructive pulmonary disease had a 9.18 times greater risk of death from their pulmonary embolism than subjects without chronic obstructive pulmonary disease (ORa=9.18; $^{95\%}$ CI = [1.02; 83.03]; p-Value=0.048) (Table 7).

Subjects who overdosed with VKA had an 11.11 times lower risk of death from their pulmonary embolism than subjects who did not (ORa=0.09; $^{95\%}$ CI = [0.01. 0.83]; p-Value=0.033) (Table 7).

Table 7. *Interpretation of the parsimonious model according to the adjusted Odds Ratios with the dependent variable "Death" in patients hospitalized for pulmonary embolism in the Cardiology Department of the Yalgado OUEDRAOGO University Hospital from 2015 to 2019. N = 311.*

	ORa	95% CI	p-value
VKA overdose			
No	1.00	—	
Yes	0.09	[0.01. 0.83]	0.033*
Age			
Under 65 years of age	1.00	—	

	ORa	95% CI	p-value
65 years and older	4.41	[1.08; 17.9]	0.038*
Incomplete right bundle branch block			
No	1.00	—	
Yes	6.09	[1.15; 32.35]	0.034*
Chronic obstructive pulmonary disease			
No	1.00	—	
Yes	9.18	[1.02; 83.03]	0.048*
HIV infection			
No	1.00	—	
Yes	4.73	[0.87; 25.76]	0.072
Stroke			
No	1.00	—	
Yes	4.15	[0.79; 21.85]	0.093

*: Variable with a statistically significant association with death.

4. Discussion

The hospital proportion of PE in our series was 9.7%. In Sub-Saharan Africa significant variability in the proportions of PE can be observed according to hospital studies ranging from 1.4% to 12% [4, 9, 10]. In Pakistan in 2019 out of 5917 admissions, 31 patients had PE. i.e. 0.5% according to Irfan et al [11]. On the other hand. in European countries. the prevalence of PE varies between 17 and 42.6% of hospitalizations [12]. The prevalence of this condition in our developing countries is probably still underestimated and will probably increase due to the increase in thromboembolic risk factors improved diagnostic means and global warming.

The female predominance of PE subjects in our study (0.6) is reported in most of the series: Fofana et al. [13], Pessinaba et al. [14], Muhammad et al. [11], N'DJESSAN et al. [15], Ndiaye et al in Senegal [16], Ouldzein et al, in Tunisia [17]. This predominance in women is generally found in venous thromboembolic disease. This finding would be justified by an increased risk attributed to women inherent in obesity, a sedentary lifestyle and the peripartum period, all of which are pro-thrombogenic states.

Regarding the cardiovascular risk factors of subjects with PE. hypertension and diabetes were the most common personal histories with 36% and 7.4% respectively in our series. Our percentages are lower than those of Pessinaba et al. [14] with 39.2% and 17.6%. from Fofana et al. [13] with 41.9% and 25.8%.

Regarding permanent thromboembolic risk factors. the first three were age 65 years or more (23.2%), HIV infection (7.7%) and history of VTE (7.4%). As for the transient thromboembolic risk factors found in subjects with PE, the most incriminated factor in our series was obesity (29.6%), which corroborates with the study by Pessinaba et al. in Togo [14] (54.9%). On the other hand. for Irfan et al. [11], prolonged immobilization was incriminated in 80.6% of cases.

The African diet. which tends to become westernized with a high-fat diet, could be one of the elements at the origin of the preponderance of obesity, taking into account the fact that in Africa. obesity is perceived as a sign of affluence and social well-being [18].

The mean time to admission to the cardiology department for subjects with PE was 11.9 days. This was higher than that of Pessinaba et al. (5.6 days) but lower than that of Djessan et al. [15]. This long delay in our series is due to the long circuit of patients because 59% of our patients compared to 27% of those in Pessinaba [14] stayed in the medical emergency room before being admitted to cardiology.

Our study demonstrates once again that it is mandatory to discuss PE in any context of acute chest pain and/or dyspnea. Indeed, in our series. chest pain and dyspnea were the telltale symptoms in 77.2% and 76.8% respectively.

On the other hand. it also confirms the need to perform a systematic ECG in the face of any acute chest pain and/or dyspnea because 81.4% of ECGs were abnormal but also to know how to look for electrical signs of right ventricular suffering to direct to PE.

This study reminds us of the leading place that we must always give to the clinic in the management of patients with PE. Examination of the vascular axes of the lower limbs for clinical signs of venous thrombosis should be early and systematic (swelling, heat, pain, positive Homans' sign), as well as pelvic

examinations and not wait for additional examinations.

Indeed. in our series. venous Doppler ultrasound of the lower limbs had a low positivity. Performed on 176 patients, it showed venous thrombosis in 19% of them and venous insufficiency in 5.5%. The literature suggests that in 90% of cases. PE is secondary to deep vein thrombosis [3]. Similarly, the abdominal-pelvic ultrasound performed in 200 patients (64.3%) had objectified abnormalities in 30 patients. i.e. 15% of the cases. Abnormalities were dominated by uterine myoma and prostatic hypertrophy with 16 and 10 patients respectively.

In our series, direct oral anticoagulants (DOACs) were the least used class of oral anticoagulant (7 patients). Unlike oral anticoagulants of the VKA class. with coumarin derivatives [warfarin or coumadin (19 patients); acenocoumaroul (40 patients)] and phenyl-indanedione derivatives [fluindione (225 patients)] in order of absolute frequency.

Thrombolysis affected 5.8% of the population. in accordance with the recommendations of learned societies and the PEITHO study [19], which indicate thrombolysis in high-risk and intermediate-risk patients. Streptokinase was the only thrombolytic used.

In our series. the hospital case fatality rate of PE was 6.1%. It is lower than that of Djessan (13%) in Côte d'Ivoire [15], Pessinaba (13.7%) in Togo [14], Irfan (16.1%) in Pakistan [11]. This lethality could be explained by the fact that most of our patients had a low or low risk of death on admission. In addition. thrombolysis has contributed to the reduction of mortality in cases at high risk of death.

Subjects with chronic obstructive pulmonary disease (COPD) had a 9.18 times greater risk of death from their pulmonary embolism than subjects without chronic obstructive pulmonary disease (ORa=9.18; 95% CI = [1.02; 83.03]; p-Value=0.048). Indeed, COPD already seriously hinders hematosis by chronically reducing alveolar ventilation. Thus, any pulmonary embolism that would occur in this area further reduces the chances of hematosis by reducing the functional blood perfusion of the alveoli.

Subjects with incomplete right bundle branch block on the electrocardiogram had a 6.09 times greater risk of death from their pulmonary embolism than subjects without pulmonary embolism (ORa=6.09; $^{95\%}$ CI = [1.15. 32.35]; p-Value=0.034). This reminds us of the importance of the exhaustive evaluation of the state of the right ventricle during PE with the search for signs of myocardial suffering biological (troponin), electrical (right bundle branch block; lesions or ischemia in V1. V2; appearance S1Q3T3) and also the echocardiographic signs of right ventricular dysfunction (TAPSE. SaT. Right Ventricular Shortening Surface. Longitudinal Strain of the Free Wall of the Right Ventricle).

Subjects who overdosed with VKA had an 11.11 times lower risk of death from their pulmonary embolism than subjects who did not (ORa=0.09; 95% CI = [0.01. 0.83]; p-Value=0.033). This result leads us to wonder if the therapeutic target of 2 to 3 INR would not be insufficient to ensure effective anticoagulation of our patients with PE? Shouldn't we be looking for a higher INR target without causing an accident at VKA?

Strengths and limitations of the study

The design of the study cross-sectional by retrospective collection of data on the clinical observations of hospitalized patients may have been the cause of bias.

Nevertheless, this study draws our attention to a question that deserves investigation: is the target INR of 2 to 3 in effective anticoagulation during pulmonary embolism effective for the survival of the black subject in tropical climates?

5. Conclusion and Recommendations

Pulmonary embolism. even when you think about it. you can never think about it enough.

To reduce the lethality of this pathology in our department. we make the following recommendations in light of our results:

1) Any patient admitted for PE. 65 years of age or older, or with COPD, or with electrical abnormalities on the ECG should be given more careful attention and monitoring.
2) Conduct cohort studies to define the most effective INR target in terms of reducing pulmonary embolism mortality in Burkina Faso.
3) Intensify tobacco control to reduce both incidental and prevalent cases.

WHAT IS KNOWN ABOUT THIS TOPIC?

1) PE is a diagnostic and therapeutic emergency

WHAT THIS STUDY BRINGS THAT IS NEW?

1) PE proportion is about 9.7% at the Cardiology Department of the Yalgado Ouedraogo University Hospital in Burkina Faso from 2015 to 2019.
2) PE lethality is 6.1% at the Cardiology Department of the Yalgado Ouedraogo University Hospital in Burkina Faso from 2015 to 2019. Survival in females (71.8%) was lower than in males (73.1%) but without statistically significant difference (p-Value=0.4).
3) This study draws our attention to a question that deserves investigation: is the target INR of 2 to 3 in effective anticoagulation during pulmonary embolism effective for the survival of the black subject in tropical climates?

Abbreviations

PE	Pulmonary Embolism
DVT	Deep Vein Thrombosis
VTE	Venous Thromboembolic Disease
EKG	Electrocardiogram
LVEF	Left Ventricular Ejection Fraction
PASP	Pulmonary Artery Systolic Pressure
PH	Pulmonary Arterial Hypertension
CT	Computed Tomography
VKA	Vitamin K Antagonist
LMWH	Low-Molecular-Weight Heparin

DOAC	Direct Oral Anticoagulant
COPD	Chronic Obstructive Pulmonary Disease

Author Contributions

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Conflicts of Interest

The authors declare no conflicts of interest.

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