

RESEARCH ARTICLE

THORACIC ANGIO SCANNER IN THE DIAGNOSIS OF PULMONARY EMBOLISM IN BAMAKO

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Manusarint Info Abstract

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Key words:-

Diagnosis, Pulmonary Embolism, Thoracic CT Angiography, Bamako Abstract

Introduction:Pulmonary embolism is the sudden obliteration (total or partial)of the trunk of the pulmonary artery or one of its branches by a circulating foreign body, most often fibrino-cruoric.

Objectives: To study the place of chest CT angiography in the diagnosis of pulmonary embolism

Material And Method:This was a descriptive prospective study from February 1, 2020 to January 31, 2021 taking into account all patients referred during this period for clinical suspicion of pulmonary embolism to the medical clinic "Marie Curie et les Etoiles". The examinations were performed with a GE 16-bar scanner in helical mode with and without injection of iodinated contrast product by an automatic injector.

Results:We diagnosed 43 pulmonary embolisms out of 327 thoracic CT angiography performed by highlighting hypodense gaps inside one or more pulmonary arteries as well as certain branches of division and the sudden interruption of the opacification of certain distal arteries. The prevalence of pulmonary embolism was 13.15%. The female sex predominated with 52% (n=22) and the sex ratio was 1.16. The average age of patients in our series was 45 years with extremes (25 to 85 years). The age group of 41-50 years waspredominant. Dyspnea and chest pain were the most frequent clinical information with44.18% and 18.60% respectively. The seat of the pulmonary embolism concerned the right and left pulmonary arteries in 60.46% and the right side was the most affected. Chronic Obstructive Pulmonary Disease (COPD); Pleurisy and Covid-19 were the lesions most associated with pulmonaryembolism (48.83%, 18.60% and 16.28%)

Conclusion: Pulmonary embolism is a serious and life-threatening pathology. Its diagnosis of certainty is made with the thoracic CT angiography, the realization of which must not suffer from any delay.

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Introduction:-

Pulmonary embolism is the sudden obliteration (total or partial) of the trunk of the pulmonary artery or one of its branches by a circulating foreign body, most often fibrino-cruoric [1]. It is the third most common cardiovascular disease after myocardial infarction and stroke [2]. It remains one of the leading causes of death in the general population [3].

It remains a serious condition because its mortality rate, although variable, can reach 11% [3]. Its prevalence in Europe is 17 to 42.6% of necrotic verifications and in the general population with an incidence of 100 to 200 per 100,000 inhabitants [4,5].In Mali, studies on pulmonary embolism have reported the following frequencies: at the CHU du Point "G" (1.7% and 9.5%) [6, 7] and at the CHU Pr. Bobacar Sidy SALL of KATI (35%) in 2020 [8].Its frequency has considerably increased in the last decade, due to the advent and availability of new exploration techniques [8].Diagnostic certainty is based on chest CT angiography, which is the key examination for non-invasive diagnosis. Chest CT angiography also allows differential diagnoses to be ruled out and the severity of pulmonary embolism to be assessed [9].Few studies have been conducted on the contribution of chest CT angiography in the diagnosis of pulmonary embolism in our context. Thus, we initiated this work with the aim of studying the place of thoracic CT angiography in the diagnosis of pulmonary embolism.

Materials and Methods:-

This were a descriptive prospective study going from February 1, 2020 to January 31, 2021, i.e., a period of 12 months. The study setting was medical clinics (Marie Curie and Les Etoiles). The inclusion criteria took into account all patients who came for chest CT angiography with a clinical suspicion of pulmonary embolism. Our parameters studied were epidemiological, clinical and scanographic. The scanner used was a General Electric (GE) type Optima, 16 strips. The acquisition was made in cranio-caudal helical mode in apnea after deep inspiration and avoiding the Valsalva before and after injection of 50-100 ml of a low-osmolarity iodinated contrast product of 300 to 350 mg iodine/ml (omnipaque) at a rate of 3 to 5 ml/s intravenously at the level of the bend of the elbow generally, using an automatic injector. The data was analyzed by SPSS version 25 and Excel 2016 software. We obtained the informed consent of all our patients and their anonymity was preserved.

Results:-

Epidemiological data:

During our study, we performed 7306 CT scans, including 327 chest CT angiograms. The diagnosis of pulmonary embolism was retained in 43 cases, i.e., a prevalence of 13.15%. The average age was 45 years with extremes of 25 and 85 years. There was a female predominance of 52% with a sex ratio of 1.16.

Clinical data:

Arterial hypertension was the most represented antecedent with 53.30%. (Table I)

Tuble 1. Distribution of patients according to personal instory.		
Personalhistory	Number	Percentage
High blood pressure	22	53,30
diabetes	4	08,90
hypertension+ diabetes	7	15,60
Lower limb thrombophlebitis.	03	6,97
Chronic cor pulmonale	2	6,70
Absent	5	11,10
Total	43	100

Table I:- Distribution of patients according to personal history.

Dyspnea was the clinical information that figured the most with 44.18% of (table II).

Table II:- Breakdown of patients according to clinical information.

Clinical information Number		Percentage
Dyspnea	19	44,18
Chest pain	08	34,87
Dilation of the right heart chambers on echo-heart	03	6,97

100

Tachycardia	05	11,62
Hemoptytic cough	01	2,32
Total	43	100

CT Data:

Total

The diagnosis of pulmonary embolism had been retained in view of hypodense gaps inside a pulmonary artery, an eccentric calcified or non-calcified thrombus, irregular or nodular thickening of the arterial walls, sudden interruption of the opacification of the distal arteries and a abrupt narrowing of the diameter of an artery

The seat of the embolism was most often proximal 51.18% and the right pulmonary artery was the most affected with 25.60% (**Table III**)

	1 0		1 2
Embolism site		Effective	Frequency (%)
Proximal	Truncular	00	00
	Right AP	11	25,60
	left AP	07	16,28
	Bilateral PA	4	9, 30
Distal	AL right	09	20,93
	AL left	03	6,97
	Bilateral AL	07	16,28
	A S bilateral	02	4.65

 Table III:- Distribution of patients according to the site of embolism on CT angiography.

The pulmonary embolism was bilateral in 26 cases (60.46%) and unilateral in 17 cases (39.54%) including 11 (25.58%) on the right and 6(15.95%) on the left.

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According to its degree of severity, the pulmonary embolism was non-massive in 83.72% and massive in 16.28% (figure 1-2 and 3)



Figure 1:- Bilateral massive pulmonary embolism.



Figure 2:- Partially Obstructive Bilateral Proximal Pulmonary Embolism.



Figure 3:- Bilateral distal pulmonary emboli in the lobar branches.

The diagnosis of pulmonary embolism was associated with other lesions, mainly COPD (48.83%) (Table IV)

Associated lesions	Effective	Percentage		
COPD	21	48.83		
Pleurisy)	08	18.60		
Bronchopneumopathy(Covid-19)	07	16.28		
РАН	4	09.30		
Atelectasis	03	6.97		
Total	43	100		

Discussion:-

Epidemiological data:

The prevalence in our study was 13.15% which is higher than those of several African studies as well WALBANE [10] 4.02%, TRAORE [11] 12.9%, BAGAYOKO [12] 1.7%, and PESSINABA [13] 3.1%. On the other hand, it is lower than that of ADIGO [14] 50.72%. These differences could be explained by the size of our samples and the coronavirus pandemic (Covid-19). Moreover, our prevalence is similar to that of European countries, which varies between 17 and 42.6% [15].

The average age was 45 years with extremes of 25 and 80 years. This result was lower than that of DIARRA [7] where the average age was 52 ± 17 years with extremes of 23 and 80 years. We had had a female predominance (52% with a sex ratio of 1.16). In contrast to THOMAS [16] found a male predominance (with 57% and a sex ratio of 1.31). On the other hand, in the study by ZONGO [17], there was equality between the two sexes.

Clinical data:

The general medicine department had requested more examinations with 53% of cases. This result differs from that of TRAORE [11] where the cardiology department had requested the majority of examinations with 51.11% of cases; 100% of the cases in the THOMAS study [16] were referred by the emergency reception service and for ZONGO [17] most of the examinations were requested by the traumatology service with 55.6% of the cases. This could be explained by the location of the study (our study was done in a private medical clinic in Bamako).Dyspnea was the main clinical information with 44.18%, followed by chest pain with 18 and 60%. TRAORE [11] found 86.87% dyspnea and 68.89% chest pain. In the literature, these two symptoms are the most frequent during pulmonary embolism [18].

CT aspects:

Massive pulmonary embolism was a minority with 16.28% of cases in our study, on the other hand in ADIGO [14], massive pulmonary embolisms were the majority with 51.61% which could be explained by the time taken to take charge.Distal pulmonary embolism accounted for 20.93% of cases in our study. This rate is comparable to those of TRAORE [11] and HOUNNASSI [5] who found respectively 51.11% and 45.4% of cases of distal embolism.Pulmonary embolism was bilateral in our study with 60.46%, rate lower than those of WALBANE [10] with 61.90% of cases, of ABBADI [19].The right side was more affected than the left side (15.38% against 7.69%). Unlike Koutonin[16], he found an equal right and left distribution of pulmonary embolism, with 7.69% on the right as on the left.Broncho-pneumopathy of viral origin (Covid-19) was associated with pulmonary embolism in 16.28% of cases in our study. Which has not been found in previous studies such as that of ABBADI [19] and KOUTONIN [20] and explained by the occurrence of the coronavirus pandemic (Covid-19)

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