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Peculiarities of Pleurisy in HIV-infected subjects at Jamot Hospital in Yaounde: Epidemiological, Clinical and Evolutionary Aspects

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Abstract

Introduction: The aim of this work was to highlight the particularities of pleurisy in HIV-infected subjects. **Methods:** This prospective, cross-sectional and comparative study was carried out from December 1, 2018to May 31, 2019 at Jamot Hospital in Yaoundé – Cameroon. Patients aged 18 and over with pleurisy were split into two groups, HIV + and HIV –. Epidemiological, clinical and evolutionary data were collected. The results were analyzed using SPSS version 20 software. **Results:** The size of our study population was 110 patients, to say 41 (37.3%) HIV positive and 69 (62.7%) HIV negative. The mean age was 39.66 ±1.14 years in the HIV + group and 46.8 ±2.20 years in the HIV - group. A history of tuberculosis was more common in HIV+; 24.4% against 8.7%; P=0.01. The general signs were more marked in the HIV+ group: weight loss (90.2% versus 44.9%; P <0.05) and excessive nocturnal sweating (61% versus 29%; P <0.05). Pneumothorax associated with pleurisy was more frequent in HIV+, non-significant difference (12.2 versus 8.7%; P= 0.55). Tuberculous etiology was more common in HIV+; P=0. The death rate was 17% in the HIV+ group versus 5.8%; P= 0.01. **Conclusion:** During HIV, pleurisy occurs at a younger age; the general signs are more marked than the respiratory signs. Tuberculosis causes and mortality are higher.

Keywords: Peculiarities, Pleurisy, HIV Positive, HIV Negative.

INTRODUCTION

Pleural diseases represent a frequent problem in clinical practice [1-3]. They are dominated by pleurisy and pneumothorax. In the West, 25% of consultations in a pulmonology department are related to a pleural pathology [1].

The clinical picture is often limited to respiratory symptoms such as chest pain and dyspnea. Faced with pleurisy, imaging shows the presence of liquid in the pleural cavity. The pleural puncture confirms it, while defining the characteristics of the effusion (exudate or transudate).

Percutaneous pleural biopsy, and more recently thoracoscopy in a favored environment, make it possible to establish the etiological diagnosis. The etiologies of pleurisy are diverse and varied, ranging from pleuro-pulmonary pathologies, systemic diseases to drug-related conditions [4].

With the advent of the Human Immunodeficiency Virus (HIV), an increase in the frequency of pleurisy has been noted in most pneumo-phtisiology departments [5]. Do pleural attacks on this debilitated terrain deviate from their classic description. The aim of this work was to research the epidemiological-clinical and evolutionary particularities of pleurisy in HIV-infected subjects at Jamot Hospital in Yaoundé-Cameroon (JHY).

PARTICIPANTS AND METHODS

We carried out a prospective, longitudinal, analytical and comparative study from December 1, 2018 to May 31, 2019 at the HJY. Indeed, Jamot Hospital is the reference center for the management of respiratory and psychiatric diseases in Yaoundé and its surroundings.

Study population

The study concerned patients hospitalized in the pulmonology unit of the JHY during the study period.

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Inclusion criteria

All patients of both sexes, aged 18 and over and presenting with pleurisy were interviewed.

Exclusion criteria

Any patient who refused to participate in the study.

Sampling

We used consecutive, non-probability sampling.

Patients were recruited as the diagnosis of pleurisy was made. We divided them into two groups. The 1st group consisted of HIV positive patients (HIV+ group) and the second of HIV negative patients (HIV - group).

Collection procedure

The collection of information was done using an anonymous questionnaire during the interview including the clinical examination, supplemented by the consultation of the medical file.

Variables collected

Sociodemographic data: age, gender.

Clinical data

- Medical history and co-morbidities.
- The time between the onset of symptoms and hospitalization or hospitalization delay.
- Functional and physical signs.

Para-clinical data

- Chest x-rays.
- Analyzes of pleural fluid after thoracentesis (biochemistry, cytology and bacteriology).
- Anatomopathological analyzes of pleural biopsy fragments or other pathological organs.
- The myco-bacteriological analyzes of the samples (sputum, gastric or bronchial aspirate fluid) consisted of a search for a resistant acid-fast bacilli (AFB) under a fluorescence microscope, after staining with auramine.
- The molecular test used was Loop-mediated-isothermal amplification (TB-LAMP) for the detection of tubercle bacilli.

Statistical analysis

Data were collected on anonymous survey forms and then entered into SPSS version 20.0 (Statistical Package for Social Sciences) software for analysis.

Positional parameters such as mean, minimum (min), maximum (max) and dispersion parameters such as standard error, standard deviation and confidence interval, were used for the description of continuous variables. Categorical variables were described in terms of numbers and percentages.

The Chi-squared test ($\chi 2$) was used to determine the degree of association between two qualitative variables. The factors that showed a significant association with HIV serology (by the chi2 test) were subjected to binary logistic regression to assess the chance of occurrence of each pathological entity induced by HIV infection. The Odds Ratio (OR) values were used to assess the chances of occurrence of each pathological entity when the OR was significant. Regarding the quantitative data, the variable means were compared after grouping by various factors (sex, HIV serology, etc.) using the Student (t) test. The probability threshold was assessed at 0.05.

Ethics

We obtained ethical approval from the Institutional Ethics Committee of the University of Douala. A written consent was signed by the participants in a framework of total confidentiality of which we were the guarantor. In addition, all analyzes were done anonymously.

RESULTS

The size of our study population was 110 patients divided into 41 (37.3%) in the HIV + group and 69 (62.7%) in the HIV - group.

Epidemiological and clinical characteristics

The male sex was predominant in the 2 groups with an identical sex ratio of 1.2. The $\chi 2$ conformity test shows us that the difference between the sexes was not statistically significant (P = 0.99). The mean age was 39.66 ±1.1 years in the HIV + group and 46.8 ±2.2 years in the HIV - group.

HIV+ patients had more history of tuberculosis (24.4% versus 8.7% ; P=0.01). Arterial hypertension was the prerogative of HIV subjects - (9.3% versus 0% ; P= 0.01); as well as diabetes (8.7% versus 0.0% ; P= 0.05).

The mean time between onset of symptoms and hospitalization was 39.7 ±3.9 days in the HIV+ group and 40.3 ±5.1 days in the HIV- group, with a P >0.05.

HIV+ patients were more emaciated (90.2% versus 44.9%; P <0.05) and had the most nocturnal sweating (61% versus 29%; P<0.05). Moreover, according to the OR [(3.828) P = 0.001] the HIV+ group had 3 times the chance of having night sweats. Productive cough was more common in HIV infection (63.4% versus 37.7%); P <0.05).

Data on location, abundance of effusions and radiological abnormalities associated with pleurisy

The study of the location and abundance of pleural effusions and radiological abnormalities associated with pleurisy did not show any statistically significant difference in the two groups (P>0.05). Nevertheless, unilateral pleurisy was more frequent in both groups (87.8% in HIV+ and 81.2% in HIV-; P>0.05). As well as damage to the right lung (58.3% and 60.7%; P=0.82).

Hydropneumothorax was the most frequent associated lesion in HIV positive patients (12.2%); while it was the interstitial syndrome (13%) in HIV negative (Table II).

Data on other paraclinical examinations

Exudative lymphocytic pleurisy was the most frequent in both groups. The pathological examination of the pleural biopsy fragment was performed in 15 patients including 1 HIV + and 14 HIV -. It confirmed the diagnosis of tuberculosis in 7 patients (1 HIV+ patient and 6 HIV- patients). The etiology of pleural metastasis was posed in 2 HIV- patients.

Bacilloscopy yield was higher in HIV+ subjects; 27.6% against 11.9%; P=0.009. As well as that of molecular biology(TB lamp) 48.3% against

15%; P=0.009. Leukopenia and anemia were more common in HIV+; respectively 19.5% versus 1.4%; P=0.001 and 70.7% versus 34.8%; P=0.006 (Table III).

Etiologies of liquid pleural effusions

The etiologies were dominated by tuberculosis in HIV+ patients (73.2% versus 36.2%; P = 0). Unlike HIV patients – who were more prone to

bacterial infections (45.0 versus 17.1 ; P= 0) (Table IV).

Mortality during pleurisy

We recorded a higher death rate in the HIV+ group (17% versus 5.8%; P = 0.01).

The causes of death were dominated by tuberculosis in the HIV+ group (85.8% versus 25% ; P <0.001]. Conversely, they were neoplastic in the HIV- group (75% versus 14.2% ;P = 0.001) (Table V).

Table 1: Epidemiological characteristics and clinical data

Variables	Items	VIH + patients N=41 (%)	VIH - patients N=69 (%)	P- value
Gender				
	Men	22 (53.7)	37 (53.6)	
	Women	19 (46.3)	32 (46.4)	
	Sex-ratio	1.2	1.2	
Age (year)				
	Middle age	39 ±1.1	46 ±2.2	0.03
Medical History				
	Tuberculosis	10 (24.4)	6 (8.7)	0
	Diabetes	0 (0)	6 (8.7)	0.05
	High Blood Pressure (HBP)	0(0)	9 (13)	0.01
	Renal failure	1(2.4)	0 (0)	0.19
	Lung cancer	0 (0)	1 (1.4)	0.62
	Breast cancer	1(2.4)	4 (5.8)	0.62
	Gastrointestinal cancer	0 (0)	1 (1.4)	0.62
	Tobacco	8 (19.5)	19 (27.5)	0.34
	Alcohol	17 (41.5)	34 (49.3)	0.42
	Tuberculous contagion	8 (20)	9 (13)	0.33
	Consultation delay	39.7 ±3.9	40.4 ±5.1	P >0.05
Symptoms				
	Asthenia	28 (68.3)	46 (66.7)	
	Weight loss	37 (90.2)	31 (44.9)	0.04
	Anorexia	19 (46.3)	27 (39.1)	
	Night sweats.	25 (61)	20 (29)	0.001
	Cough	34 (82.9)	52 (79.8)	0.35
	Expectoration	26 (63.4)	26 (37.7)	0.01
	Dyspnea	26 (63.4)	46 (66.7)	0.72
	Chest pain	28 (68.3)	46 (66.7)	0.86
	Hemoptysis	2 (4.9)	7 (10.1)	0.33

Table 2: Distribution of patients according to location, abundance of effusions and radiological abnormalities associated with the pleural syndrome

Variables	VIH + patients N=41(%)	VIH – patients N=69 (%)	P-value
Location of the effusion			
Bilateral effusion	5 (12.2)	13 (18.8)	**0.36**
Unilatéral effusion N=92 (83.6%)	36 (87.8)	56 (81.2)	0.36
Left unilateral effusion	15 (41.7)	22 (39.3)	0.82
rigth unilateral effusion	21 (58.3)	34 (60.7)	0.82
Abundance of unilateral effusions			
Left effusion of small abundance	0 (0)	2 (9.1)	0.28
Left effusion of medium abundance	7 (46.7)	13 (59.1)	
Abundant left effusion	8 (53.3)	7 (31.8)	
Right effusion of small abundance	1 (4.8)	8 (23.5)	0.15
Right effusion of medium abundance	14 (66.7)	16 (47.1)	
Abundant right effusion	6 (28.6)	10 (29.4)	
Radiological abnormalities associated with pleurisy			
Hydropneumothorax	5 (12.2)	6 (8.7)	0.55
Interstitial syndrome	3 (7.5)	9 (13)	0.37
Alveolar syndrome	2 (4.9)	6 (8.7)	0.45
Cardiomegaly	2 (4.9)	8 (11.6)	0.23
Mediastinal syndrome	0 (0)	1 (3.8)	0.36
Radiological abnormalities associated with pleurisy			
Hydropneumothorax	5 (12.2)	6 (8.7)	0.55
Interstitial syndrome	3 (7.5)	9 (13)	0.37
Alveolar syndrome	2 (4.9)	6 (8.7)	0.45
Cardiomegaly	2 (4.9)	8 (11.6)	0.23
Mediastinal syndrome	0 (0)	1 (3.8)	0.36

Table 3: Biochemical, cytological and bacteriological analyzes of pleural fluid, results of pleural biopsy and sputum examination

Variables	VIH + patients N=41 (%)	VIH - patients N=69 (%)	P-value
Biochemistry	N= 41 (%)	N=69 (%)	
Transudate	0 (0)	1 (1.4)	0.44
Exudate	41 (100)	68 (98.6)	0.44
CytologyN= 101	N= 36 (%)	N=65 (%)	
Predominance of lymphocytes	28 (77.8)	35 (53.8)	0.03
Predominance of polynuclear neutrophils	6 (16.7)	27 (41.5)	0.03
Mixed cellularity	0 (0)	3 (4.7)	
Neoplastic cells	2 (5.5)	0 (0)	

Bacteriology N=68	N= 23 (%)	N=45 (%)	
microbiology unidentified germs	21 (91.4)	43 (95.6)	
Microbiology germs identified	1 (4.3)	2 (4.4)	0.3
Pleural biopsy results N=15 (13.6)	N=1 (%)	N=14 (%)	
Nonspecific chronic inflammation	0 (0)	6 (42.9)	
Tuberculous granuloma	1 (100)	6 (42.9)	
Metastasis	0 (0)	2 (14.2)	
Detection of tubercle bacilli in sputum. N=110	N= 41	N= 69	
Positive microscopic examination	11 (26.8)	8 (11.6)	0.009
Molecular examination (TB-Lamp)	20 (48.8)	10 (14.5)	0.009
Complete blood count.			
Leukopenia	8 (19.5)	1(1.4)	0.001
Normal white blood cell count	25 (61)	38 (55.1)	
hyperleukocytosis	8 (19.5)	30 (43.5)	0.001
Hemoglobin level < 10 g/dL	29 (70.7)	24 (34.8)	0.006
Hemoglobin level ≥ 10 g/dL	12 (29.3)	45 (65.2)	0.006
Thrombocytopenia	1(2.4)	2 (2.9)	0.98
Normal platelet count	35 (85.4)	59 (85.5)	0.98
Thrombocytosis	5 (12.2)	8 (11.6)	0.98

Table 4: Etiologies of liquid pleural effusions

Etiologies	VIH + patients N= 41 (%)	VIH – patients N= 69 (%)	P-value
Tuberculous pleurisy	30 (73.2)	25 (36.2)	0
Bacterial pleurisy	7 (17.1)	31 (45.0)	0
Neoplastic pleurisy	4 (9.7)	13 (18.8)	0.35

Table 5: Mortality during pleurisy

Death		VIH + patients N= 41 (%)	VIH – patients N= 69 (%)	P-value
Number of deceased		7 (17.0)	4 (5.8)	0.01
Etiology of deaths N=11	Tuberculosis	6 (85.7)	1 (25.0)	0.001
	Neoplasia	1 (14.3)	3 (75.0)	0.001

DISCUSSION

During our study aimed at analyzing the epidemiological-clinical and evolutionary particularities of pleurisy in HIV- infected subjects at Jamot Hospital in Yaoundé-Cameroon, we retained a number of 110 patients, including 41 HIV carriers, i.e. a prevalence of 37.3%, corroborating the work of Adambounou *et al.*, in Togo who report a rate of 32.8% of HIV during pleurisy [3].

Although the prevalence of AIDS is in clear decline at the national level, this high prevalence would be due to the bias of selection of this sub-population of patients suffering from pleuro-pulmonary disease.

Indeed, the lung remains the organ of choice for the expression of AIDS-related diseases.

The gender study did not establish a statistically significant difference.The male sex was predominant in the 2 groups with an identical sex ratio of 1.2. This male preponderance has been reported by numerous studies carried out in pulmonology or internal medicine departments. It could be explained by men's vulnerability to respiratory diseases [2-9].

In our series, pleurisy occurred earlier in HIV+ patients. The mean age was 39.66 ±1.14 years versus 46 ±2.2; P<0.05. This result is contrary to

that of Adambounou's et al. in Togo who report a mean age of 48.48 ± 17.81 years in the HIV+ group versus 39.78 ± 8.82 years [3]. Our findings shed light on the heavy toll that HIV and AIDS continue to impose on the working population and their economic and social repercussions, indeed midlife is the age when workers are at the peak of their productive lives [10].

We found a higher frequency of history of tuberculosis in the HIV+ population (P=0.01). In fact, tuberculosis of any clinical form is common during HIV infection [7-11]. The proportions of alcohol and tobacco users recorded in the two groupswere without significant difference. This finding raises the issue of ignorance or little interest in immunocompromised HIV in the face of these risk factors which are also a factor of local or general immunosuppression by altering the natural immune defences.

The mean time between the onset of symptoms and hospitalization or consultation time was almost identical in the two groups. This was 39.66 ±3.9 days in the HIV + group and 40.38 ±5.1 days in the HIV- group; P>0.05. Long delays in consultation have often been reported in the African literature during lower respiratory conditions of various etiologies [11,12].

Indeed, in Africa, recourse to health centers only occurs in the face of worsening symptoms or the ineffectiveness of traditional medicine and self-medication. Added to this is the lack of social security coverage for medical care [9]. The frequency of respiratory functional signs was identical in the two groups. And these dominated the clinical presentation in the 2 groups to the detriment of the general signs. These were cough, chest pain and dyspnea. In addition, productive cough, weight loss and night sweats were more frequent in HIV+ subjects; P>0.05. Adambounou *et al*., made the same observation in his hospital series in Togo [3]. The unilateral seat and the predominance of the right localization of pleurisy could be explained by the youth of our study population. These findings corroborate certain data from the literature [2,13]. Localized pleurisy on the left is frequent in the elderly [3].

Many authors agree on the fact that unilateral effusions of right location are more frequent during infectious and malignant exudative pleurisy and that bilateral effusions are generally transudates caused by heart failure [2,13-15]. The radiological lesions associated with pleurisy were identical in the two groups. Nevertheless, hydropneumothorax was the most frequent associated lesion in the HIV + 12.2% group.

On biochemical examination, the pleural fluid was mainly an exudate in the two groups and this in almost identical proportions, 100% in HIV + versus 98.6%; P>0.05. This result is similar to those of studies conducted in emerging countries [2,13-16]. On cytology, pleural fluid was more frequently predominantly lymphocyte in HIV+ patients (77.8% versus 53.8; P<0.05). On microbiological examination, the proportion of germs identified was low and of equal value in the two groups (4.3% HIV + group versus 4.4%; P> 0.05). Ibrahim *et al*., were able to isolate germs in 24.4% of their patients [2].

This difficulty in isolating germs could be explained by the generalization of empirical antibiotic therapy and above all by the propensity for self-medication, aggravated by the phenomenon of the sale of street drugs by untrained personnel. The contribution of the pleural biopsy could not be studied, because very little performed in all the participants 15 (13.6%), including only one HIV + patient. The diagnosis of tuberculosis from microscopic examination and by molecular technique TB lamp was higher in the HIV + group (respectively 27.6% and 48.9%) versus (11.9% and 15%) in the HIV- group; P<0.05.

Blood count abnormalities revealed that HIV+ patients were more frequently anemic (70.7% versus 34.8%) and had leukopenia (34.8% versus 1.4% ; P<0.05). Platelet abnormalities were without difference in the 2 groups. The proportion of presumptive diagnoses was relatively high, due to the absence of microbiological or anatomo-pathological confirmation in relation to the limits of the technical platform and the onerous cost of the examinations entirely borne by patients. Tuberculosis was the most frequent etiology of pleurisy in HIV+ patients and they had less bacterial pleurisy. The mortality rate was significantly higher in HIV+ patients (17.0% versus 5.8%). The main cause of death was tuberculosis in the HIV+ group. HIV infection has a negative impact on the evolution of tuberculosis, indeed, for Adambounou *et al*., mortality was linked to HIV infection and the severity of immunosuppression [3].

CONCLUSION

Pleurisy during HIV + occurs at an early age. These patients had more of a history of tuberculosis, the general signs were more marked (weight loss and nocturnal sweating) than the respiratory signs. The performance of bacilloscopy and molecular biology was better. Leukopenia and anemia were more frequent. Tuberculosis was the main etiology of pleurisy and mortality was higher.

Conflict of Interest

None declared.

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None declared.

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