

Tuberculosis Confirmed Bacteriologically: Clinical, Biological and Radiological Particularities Concerning 209 Cases Hospitalized at the University Hospital of Rabat-Morocco

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Abstract:- Tuberculosis is a public health problem. The objective of our study is to describe the clinical, biological and radiographic aspects of bacteriologically confirmed pulmonary tuberculosis. This is a retrospective descriptive study of 209 patient files presenting a first episode of bacteriologically confirmed pulmonary tuberculosis hospitalized at the Phtisiology Department of the university hospital center of rabat from January 2014 to January 2016. The population of the study is made up of 54% of men and 46% of women, a sex ratio of 1.17. The average age of patients is 39 years old. The notion of recent tuberculosis contagion is found in 7.17% of patients and the notion of active smoking is noted in 33.9% of patients. Cough was present in 79.4% of cases and haemoptysis was noted in 22% of cases. Weight loss (91.8%) and fever (88.5%) are almost constant. Anemia is found in 79.4% of cases, it is hypochromic microcytic in the majority of cases. The average hemoglobin level is 9.3 g / dl. HIV serology was positive in 7 cases (3.3%). Radiologically, lesions are bilateral in 55.5% of cases and diffuse in 30.1%. The alveolar opacities are found in 43.5% of the cases and the excavated lesions are observed in 33.9% of the cases. Pneumothorax revealed the diagnosis in 11.4% of cases. The average diagnostic delay is 2 months. The diagnosis was mainly based on the presence of AFB in the direct examination of sputum (in 91.8% of cases).

The purpose of this study is to unravel the problem of delayed diagnosis of pulmonary tuberculosis and to insist on the active search for tuberculosis in the immunocompromised field.

Keywords:- Pulmonary Tuberculosis; Clinical Particularities; Biological Particularities; Radiological Particularities.

I. INTRODUCTION

Tuberculosis is a major cause of morbidity and mortality in the world: Every year, millions of people still contract TB. In 2017, TB caused 1.3 million deaths among HIV-negative people and 300,000 additional deaths among HIV-positive people [1]. In Morocco, the latest estimates of the World Health Organization reported 36,000 incident cases of tuberculosis for the year 2016, an incidence of 103 cases per 100,000 inhabitants. It is estimated that, for the same year, 3,300 deaths were related to this disease in the general population, with a mortality rate of 9.3 per 100,000 inhabitants [2]. That is why we have planned to carry out this study whose objective is to determine the clinical, biological and radiological aspects of bacteriologically confirmed pulmonary tuberculosis in order to better characterize it in order to improve the diagnostic means in the purpose to improve the treatment.

II. MATERIAL AND METHODS

➤ *Type and Setting of the Study*

This is a retrospective descriptive study on 209 patient files presenting a first episode of bacteriologically confirmed pulmonary tuberculosis and hospitalized at the Phtisiology Department of the university hospital center of rabat from January 2014 to January 2016.

➤ *Inclusion Criteria*

All new cases of bacteriologically confirmed pulmonary tuberculosis were included in the study.

➤ *Exclusion Criteria*

Patients younger than 15 years and relapsed cases of pulmonary tuberculosis were excluded from the study. As well as cases of relapse.

III. RESULTS

➤ *Sociodemographic Characteristics*

The study population consisted of 54% (n = 113) of men and 46% (n = 96) of women, a sex ratio of 1.17. The average age of patients is 39 (range: 16 to 89 years).

➤ *Antecedents*

The concept of recent tuberculous contagion was found in 15 (7.17%) patients. 22 patients (10.52%) are diabetic, 3 patients (1.43%) have chronic heart disease; The concept of active smoking is found in 33.9% of patients, 8 patients (3.82%) are ethyl and 8 cases (3.82%) have a history of substance abuse.

➤ *Clinical Data*

Cough is present in 166 cases (79.4%), it is productive in 130 cases (62.2%). Hemoptysis was noted in 46 cases (22%), dyspnea was found in 111 cases (53%) and thoracic pain in 33 cases (15.78%). Weight loss was noted in 192 cases (91.8%), fever in 185 cases (88.5%) and night sweats in 122 cases (58.3%) (Table 1). The clinical examination revealed the presence of wheezing and crackling rales in 85 cases (40.6%), pulmonary condensation syndrome in 70 cases (33.49%), airway syndrome in 19 cases (9%) and syndrome of fluid effusion in 27 cases (12.9%).

Symptom	Effective	percentage
Cough	166	79.4%
Hemoptysis	46	22%
Dyspnea	111	53%
Chest pain	33	15.7%
emaciation	192	91.8%
Fever	185	88.5%
Night sweats	122	58.3%

Table 1:- Frequency of clinical symptoms.

Anemia was found in 166 cases (79.4%), it is: Microcytic hypochromia in 97 cases (58.43%) and

normochromic normochrome in 78 cases (46.98%). The average hemoglobin level is 9.3 g / dl. HIV serology was positive in 7 cases (3.3%).

➤ *Radiological Presentation*

The radiological lesions are bilateral in 116 patients (55.5%) and diffuse in 63 patients (30.1%). The alveolar opacities are found in 91 cases (43.5%), the excavated lesions are observed in 71 cases (33.9%) and the nodular and micronodular lesions in 74 cases (35.4%). Pneumothorax revealed the diagnosis in 24 cases (11.4%) and pleurisy was found in 45 cases (21.5%) (Table 2).

Radiological lesion	Effective	Percentage
Alveolar opacities	91	43.5%
Excessed lesions	71	33.9%
Nodular and micronodular lesions	74	35.4%
Pneumothorax	24	11.4%
Pleurisy	45	21.5%

Table 2:- Frequency of radiological lesions.

➤ *Diagnostic*

The average diagnostic delay is 2 months. The diagnosis was based on the presence of AFB in the direct examination of sputum in 192 patients (91.8%) with a mean diagnostic delay of 60.6 days, on the presence of AFB in the sputum culture in the solid medium of Lowenschten Johenssen. in four cases (2%) with a mean diagnostic delay of 73.3 days, on the presence of AFB on direct examination during bronchial fibrosis in 6 cases (2.87%) with an average diagnostic delay of 37.5 days, and on the presence of AFB in the bronchial fibroaspiration culture in 2 cases (0.95%) with a mean diagnostic delay of 75 days. Genexpert in sputum was performed in a minority of patients because of its unavailability in all health care facilities and because of its high cost. It allowed to retain the diagnosis in 5 cases (2.39%) with an average diagnostic delay of 47.5 days (Table 3). It should be noted that this delay includes the delay that the patients put before consulting as well as the time of search for AFB by direct microscopic examination on two or more smears or by culture.

Diagnostic method	Effective	Percentage	Average diagnostic delay
AFB presence in sputum examination	192	91.8%	60.6 days
Presence of AFB in sputum culture	4	2%	73.3 days
Presence of AFB on direct examination of bronchial fibroaspiration	6	2.87%	37.5 days
Presence of AFB in the culture of bronchial fibroaspiration	2	0.95%	75 days
Genexpert in sputum	5	2.39%	47.5 days

Table 3:- Average diagnostic delays according to the diagnostic methods

IV. DISCUSSION

Tuberculosis is one of the top 10 leading causes of death in the world and the leading cause of death due to a single infectious agent. Globally, 10 million people became infected with TB in 2017 and 90% of the cases were adults [1]. In general, tuberculosis is more common in the male than in the female gender. In Morocco, the ratio of the reported incidence of bacteriologically confirmed pulmonary TB to man is 2.4 in 2015. Of the reported cases, 70% are between 15 and 44 years old; indicating that tuberculosis continues to affect the economically productive young adult, the average age of TB patients is 35 in 2013 [2]. In our study, a male predominance was actually observed with a sex ratio of 1.17. This predominance has also been reported in several studies conducted in underdeveloped countries but with lower ratios than ours [3,4,5]. The average age of patients is 39, which is consistent with literature data [3,4,6,7,8,9,10].

The onset of symptoms is usually progressive. Functional signs are dominated by cough, which becomes more and more common in weeks and does not give way to symptomatic treatments. Hemoptysis occurs only in 10% of cases, but worries the patient and directs quickly to the diagnosis. Dyspnea indicates an advanced form of the disease or pleural involvement. Chest pain is infrequent. Clinical examination of the chest is remarkably negative in pulmonary tuberculosis, contrasting with the importance of clinical and radiological signs. Impairment of the general condition is common in tuberculosis. The slimming can, in serious forms, exceed 10 kg. The fever, is usually low, and rarely encrypted. Night sweats are very common and must be systematically sought. All these signs must make the diagnosis evoke, especially when persisting for more than 3 weeks [11]. In our study, the general signs are almost constant. Thus, weight loss was noted in 192 cases (91.8%) and fever in 185 cases (88.5%), which is consistent with data from the literature. Hemoptysis is found in 22% of cases, which is close to what has been found by other authors [3,4].

Chest X-ray remains first-line imaging. The radiological manifestations of pulmonary tuberculosis may vary according to host-related factors, but in most cases they are sufficiently characteristic to suggest the diagnosis. In the absence of bacteriological confirmation, and when the lesions are complex and difficult to interpret, thoracic computed tomography is necessary to detect equivocal aspects and analyze complications. In the presence of an excavation, the bacteriological diagnosis of tuberculosis is easy, the sputum study being positive in 98% of cases on direct examination [6]. In our study, the radiological lesions are bilateral in 116 patients (55.5%), this result is quantitatively different from what has been reported in the literature [3,6,9,19]. The lesions are diffuse in 30.1% of our patients, this result is much lower than that reported in the reviews [3,6], which can be explained by the shorter diagnostic delay of our study. The alveolar opacities are found in 43.5% of our patients and lesions excavated in

33.9% of cases, which is significantly lower compared to data in the literature [3,6].

Hematologic disorders during tuberculosis are frequent and not serious in almost all cases [20]. These disorders are dominated by anemia, the mechanism of which can be attributed to the cytokines secreted by macrophages active against tubercle bacilli, which leads to a decrease in erythropoietic production leading to a blocking of the reticuloendothelial transfer of iron in the globules. red. In our study, anemia was found in 79.4% of patients, it is hypochromic microcytic in the majority of cases, which is consistent with data from the literature [3,6,21,22,23].

The diagnosis of tuberculosis is based on clinical and radiological arguments but the confirmation is bacteriological. The culture remains the gold standard, its sensitivity is 60 to 90%, and its specificity is 100%. It allows the diagnosis of tuberculosis with negative microscopy including extrapulmonary tuberculosis where the diagnosis is difficult to reach by direct examination [17]. The development of molecular biology methods and their standardization have led to the detection and rapid identification of mycobacteria [18]. The sensitivity of Genexpert is greater than 95% in the case of respiratory specimens with a direct positive examination, and varies between 65 and 77% in the case of negative microscopic examination. Its specificity is very high (97% to 100%). However, a negative Genexpert examination does not exclude the diagnosis of tuberculosis. The positivity of tuberculin intradermoreaction is in no way specific for active tuberculosis. On the other hand, a tuberculin shift has more value of diagnostic orientation, especially in a country with a high TB endemic. The histological study of the specimens makes it possible to highlight the epithelioid and gigantocellular granuloma with caseous necrosis which is all the more specific for tuberculosis as it is associated with a positive culture of the fragment [17].

In our patients, the average diagnostic delay is 2 months, this delay is comparable to that of other studies [10,12]. On the other hand it is an average delay which is long compared to the results of certain studies [13,14,15], but which remains lower compared to the results reported by other authors [3,4,6,16,] . This delay in diagnosis is explained in the literature by the delay that patients place before consulting in a health center or by the failure of health systems [3].

V. CONCLUSION

Tuberculosis remains a real public health problem, although health policy gives it a special priority. In the light of the results of our study, it is recommended to privilege and generalize genotypic tests including Genexpert in order to obtain a much faster diagnosis and strengthen screening measures around index cases and actively seek tuberculosis in risk areas such as living with HIV.

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