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Clinical, Radiological and Evolutionary Profile of Miliary Tuberculosis in Saint-Louis

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Abstract

***Introduction:** Miliary tuberculosis is a severe, acute form of tuberculosis caused by lymphohematogenous dissemination of tuberculosis bacilli from a focal lesion ruptured in the blood or lymphatic flow, and results from the lymphohematogenous dissemination of tuberculosis bacilli from a focal lesion ruptured in the blood or lymphatic flow and is manifested on the chest x-ray by a seedling of small puncture-shaped opacities the size of a "grain of millet" (1 to 2 mm).*

***Patients and Methods:** We conducted a retrospective study of 55 cases of miliary tuberculosis collected at the Pneumology department of the Saint-Louis regional hospital between January 2014 and December 2020.*

***Results:** Miliary tuberculosis represented 4.1% (n = 55) of all tuberculosis diagnosed. The sex ratio was 0.90. The average age of the patients is 37 years with extremes of 17 and 73 years. Tuberculosis contagion was found in 28 patients, i.e. 50.9%. The chest x-ray revealed a typical miliary aspect in all cases. The definitive diagnosis of tuberculosis infection was made in 65.4% of cases. The dissemination results showed associated extra thoracic involvement in 47.2%. Antituberculosis treatment was initiated in all patients combining rifampicin, isoniazid, pyrazinamide, ethambutol, for two months, followed by four months of rifampicin, isoniazid . The evolution in the hospital environment was marked by a case fatality rate of 9%.*

***Conclusion:** Miliary tuberculosis is a severe, life-threatening form of tuberculosis, hence the need for early diagnosis and management.*

Keywords: *Tuberculous miliary; Chest x-ray; Saint-Louis; Senegal*

Introduction

Tuberculosis, a communicable disease, is a major cause of ill health, one of the top 10 causes of death worldwide and the leading cause of death from an infectious agent (before HIV / AIDS) [1]. Despite significant progress in the fight against this disease, with reductions in TB incidence and mortality, it remains a major public health problem. Globally, it is estimated that around 10 million people contracted tuberculosis in 2019 with an estimated death toll of 1.3 million, including 208,000 in people living with HIV AIDS [1].

Miliary tuberculosis is an acute and severe form of tuberculosis which can be life-threatening [2, 3, 4]. It results from the lymphohematogenous dissemination of tuberculosis bacilli from a focal lesion ruptured in the blood or lymphatic flow [4] at one or more points in the body. It is manifested on the chest x-ray by a seedling of small puncture-shaped opacities the size of a "grain of millet" (1 to 2 mm) rounded and well limited, not very dense, equal to each other and usually disseminated with regularity in the whole. of both lung fields [5]. It is an uncommon disease and accounts for less than 2% of pulmonary tuberculosis

according to some authors and around 10% of extra-pulmonary tuberculosis [2,3, 6]; the main organs affected in miliary tuberculosis are the meninges, lymph nodes, bones, liver and serosa.

We conducted this study with the aim of establishing the clinical, radiological and evolutionary profile of miliary tuberculosis in Saint-Louis.

Material and Methods

This is a retrospective study carried out in the pneumo-phthisiology service of the regional hospital of Saint-Louis, between January 2015 and December 2020. All cases of radiological miliary whose tuberculous nature was strongly suspected on a beam of epidemiological, clinical, paraclinical and evolutionary arguments were retained.

For each patient, we completed a survey sheet which allowed us to collect socio-demographic characteristics; history (including tuberculosis contagion, history of tuberculosis, alcohol and tobacco intoxication and predisposing conditions (diabetes, HIV); clinical signs; radiological images; as well as the treatment received and progress.

Data was entered and analyzed using Jamovi software, version 1.6.9.0

Results

Sociodemographic Data

During the study period, 1,387 patients were hospitalized in the pneumo-phthisiology department for tuberculosis of any form. We collected 55 cases of hematogenous disease, representing a frequency of 4.1% of all hospitalized patients. The sex ratio (male / female) was 0.9. The average age was 37 years with extremes of 17 and 73 years. Seventy-four percent (74%) or 41 patients in our study population were in the age group 17 to 47 years.

History and Contributing Factors

Of the 55 patients 81.8% (45 cases / 55) were not vaccinated with BCG. Tuberculosis contagion was found in 28 patients, ie 50.9%.

Active tobacco intoxication was in 34.5% of patients (19/55 cases), including 4 women.

We noted 21.8% diabetes mellitus (12 cases / 55), 12.7% cases (n = 7) of HIV infection and 5 cases of systemic illness (lupus).

Clinical Data

The average diagnostic time was 66 days for 80% (n = 44) of the patients. Fever was found in 78.1% of our patients (n = 43). All of our patients presented with a deterioration in their general condition (recent weight loss, physical asthenia and / or anorexia).

The functional signs were dominated by cough which was found in all patients and dyspnea on exertion found in 51 patients (92.7%). Hemoptysis was found in 4 patients, or 7.2%. The data from the physical examination are recorded in Figure 1

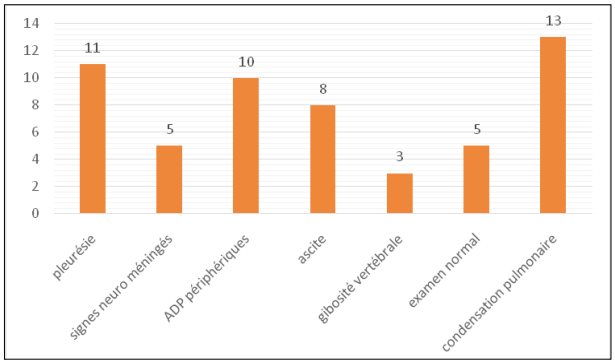

Figure1. *results of the physical examination*

Paraclinical Data

The chest x-ray, carried out in all patients, showed an image of miliaria (Fig. 1), associated with polycyclic para-hilar opacities in "chimney flow" in 12.7% of cases n = 7 cases (11.1%) , with pleural involvement in 20% of cases (n = 11), (8.6%) and pericardial involvement in 3 patients (5.4%).

The tuberculin skin test (IDRT) performed in all patients was negative in 37 patients (67.2%) and positive in 18 patients (32.8%).

The detection of Acido-Acoolo-Resistant Bacilli (BARR) was positive in 15 cases.

All the patients who presented with pleurisy underwent thoracentesis in which the fluid was exudative and the Xpert MTB Rif test had demonstrated the Koch's bacillus genome in 5 patients. The pleural puncture biopsy performed in the other 6 patients came back positive.

Among the 55 patients, 23 (46.7%) had at least one associated extrapulmonary involvement, the most frequent were lymph nodes (n = 10) or 20.4% and pleural (n = 6), or 12.5%.

The abdominal ultrasound performed in 8 patients

who presented with ascites showed coeliomaenteric lymphadenopathy called "peritoneal cakes" very specific to peritoneal tuberculosis

The Xpert MTB Rif test performed on the lumbar puncture fluid of 5 patients was positive in 3 patients.

Among the patients, 10 patients with peripheral ADP, lymph node biopsies were performed, of which 70% (n = 7) revealed tuberculoid granulomas with central caseous necrosis, thus confirming tuberculous involvement.

Among the 55 patients, 47.2% (n = 26) had at least one associated extra thoracic involvement, the most frequent were lymph node 20% (n = 11) and abdominal 14.5% (n = 8).

Anti-tuberculosis treatment was initiated in all patients combining four anti-tuberculosis drugs according to the 2RHZE / 4RH treatment regimen of the national tuberculosis control program (PNT), namely rifampicin, isoniazid, pyrazinamide, and hambutol, for two months, followed by four months of rifampicin , isoniazid.

Adjunct corticosteroid therapy at a dose of 0.5 mg / kg per day at a decreasing dose over 30 days depending on the clinical course was instituted in all dyspneic patients (n = 52).

We deplored 5 deaths out of the 55 patients treated, i.e. 9%. These deaths were attributable to massive pulmonary embolism with right heart failure in 2 patients and 3 deaths from complications of HIV.

Discussion

Fifty-five cases of miliary tuberculosis were identified out of 1387 cases of tuberclosis of all forms, hospitalized in the pneumo-phthisiology department of the regional hospital of Saint-Louis, i.e. a hospital frequency of 4.1%, variable according to the authors. (Tab. 1).

TableI. Frequency of miliary tuberculosis among all tuberculosis diagnosed according to some authors

Authors	Year	country	% miliaytuberculosis
Ouédraogo[8]	2000	Burkina Faso	5,21
Achid[12]	2003	Maroc	5,4
Haloui[10]	2004	Togo	0,92
Sharma [18]	2005	Inde	2
Mahouachi[11]	2006	Tunisie	0,93
Rakotomizao [16]	2006	Madagascar	0,8
Fetal[13]	2009	Algérie	2
Touré[7]	2009	Sénégal	3,8
Toloba[4]	2009	Mali	5
Zaghba[2]	2016	Maroc	0,92
Notre étude	2020	Sénégal	4,1

In our study, we noted the predominance of miliary tuberculosis in young subjects. This observation was made by the majority of series from countries with a high tuberculosis burden, particularly in Africa [2, 4, 7-14]. Thus, the average age was 37.5 years for Touré [7], 36 years for Zaghba [2] and 41 years for Toloba [4]. This is also the case in our study with the age range (17-47 years) representing 74% and an average age of 37 years.

In the literature, miliary tuberculosis is classically more common in humans, this predominance was noted in the study by Msaad [4,15], as in our study. However, a slight female predominance has been described by some [16,17,18].

In our work, tuberculosis contagion was found in 50.9% (n = 28). It should be looked for systematically in the entourage of the patient. The tuberculosis count varies according to the authors from 15 to 35% [13,17,18].

Smoking probably plays a role in the appearance of miliary tuberculosis by local alteration of the defense mechanisms [7,8]. In the series by Zaghba [2], 46.7% of patients are smokers against 35.5% in that of Ouédraogo [8], while in our series, patients who smoke represented 34.5%.

The frequency of tuberculosis-HIV co-infection is a well-established fact, documented and reported

by several authors [7,10,18,19], particularly for pulmonary localization. Touré et al. [7] reported 32% of cases of miliary tuberculosis-HIV co-infection, and Toloba et al. [4] reported 23.4%, whereas in our series, only 7 patients were infected with HIV, ie (12.7%).

In our study, 81.8% (n = 45) of patients presented with a BCG vaccine scar. While the protective power of BCG has been demonstrated, in particular in children and against severe extra-pulmonary forms, the impact on the incidence of tuberculosis is difficult to assess; for example, in sweden, the overall incidence of tuberculosis continued to decline after the discontinuation of generalized immunization of newborns, but an upsurge was noted, especially in children of foreign origin [4,20].

A diagnostic delay of more than two months is found in various series [6,13,17]. In Msaad's study, the mean diagnostic time was 79 days [15], while in Zahba's study [2], it was 65 days, which corroborates the results of our study (66 days) and could take into account the progressive onset of the disease, as well as its insidious and not very suggestive character at the beginning.

Only respiratory symptoms attract attention and lead to a chest x-ray [2,4]; this explains the long diagnostic delay that we have observed.

Clinically, fever is present in the majority of cases [9], justifying the systematic practice of a chest X-ray. Cough was present in all patients in our study, and remains the most frequently reported functional sign [4,8,9]. Pulmonary condensation syndrome was found in 23.6% (n = 13) whereas in the study by Toloba et al. [4], it is found in 64.4% of patients. The association of pleurisy is reported in 14.7% by Toloba et al. [4] and 22.5% by Ouédraogo et al. [8], which corroborates the results of our study (20%).

Among extra thoracic locations, neuro meningeal involvement is variously assessed in the literature, varying between 10 to 30% [18], it is 3% in the series by Ouédraogo et al. [5], 11.1% in the Zaghba et al series while in our study it was 47.2% (n = 26).

Radiologically, miliary tuberculosis is classically manifested by punctiform micronodular opacities, the diameter of which hardly exceeds three millimeters and which are uniformly disseminated in the two pulmonary fields. Atypical aspects may exist and are defined by the presence of nodules or macronodules with a diameter greater than three millimeters present in 10% of cases according to Sharma et al. [18]. In our series, the chest x-ray showed typical images of miliaria in all cases (fig. 2). The role of the chest x-ray is crucial in the face of a feverish miliaria in any tuberculous endemic area [4] and any delay in therapeutic management puts the patient's vital prognosis at risk.

Figure2. Frontal chest x-ray showing miliary tuberculosis

Chest computed tomography is more efficient than chest x-ray in miliary matters. It allows the detection of small parenchymal abnormalities that would go unnoticed on a standard chest x-ray [21]. It is also useful for demonstrating associated involvement, in particular mediastinal lymph node [3,7].

Tuberculin anergy is common in miliary tuberculosis. It is indicative of immunosuppression in this severe form of tuberculosis [5,6]. In our series, the tuberculin skin reaction was negative in 37 cases (67.2%).

According to the literature, the percentage of confirmed tuberculous miliaries is variable. Thus, it is 82% for Kim and Kim [22], and 36% for Ouédraogo and Ouédraogo [8].

In our series, the definitive diagnosis of tuberculosis infection was made in 65.4% of cases (n = 36): the isolation of BKs by direct examination of the sputum (n = 15), the Xpert of pleural fluid and positive CSF (n = 8), positive pleural biopsy (n = 6) and positive lymph node biopsy (n = 7).

The positivity of the bacilloscopies would be

attributable either to a confluence of the nodular lesions followed by bronchial drainage, or to pre-existing micro-excavations or to a ganglio-bronchial fistula [8]. The lower level of confirmation than in the published series can be explained by the inconsistency with which the confirmatory examinations are carried out; it can be estimated, however, that in a country with a high tuberculosis endemicity, the presence of a clinical x-ray picture suggestive of tuberculosis may be sufficient to make the diagnosis and initiate treatment. This view is shared by other authors [5,18,23].

The advent of anti-tuberculosis drugs and the improvement of resuscitation facilities have changed the course and prognosis of this disease and have helped reduce its mortality. In the absence of anti-tuberculosis treatment, miliaria was spontaneously fatal after one year [18,23]. We did, however, deplore 9% of deaths (n = 5). Mortality varies between 25 to 30% according to Sharma [18], 52% according to Ouédraogo and Ouédraogo [8], it is largely correlated with the association with meningitis.

Corticosteroid therapy was started in 94.5% of our patients. It was only indicated in 20% according to Sharma based on the presence of meningitis, pericarditis, pleurisy, ARDS and adrenal insufficiency of corticosteroids on cytokines [24].

Conclusion

Miliary tuberculosis, like basilar tuberculosis (tuberculous meningitis), is a severe, acute form of tuberculosis that is life-threatening. Its diagnosis remains difficult in our African context where treatment is often focused on a range of clinical and therapeutic epidemiological arguments.

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