

Pediatric Lymph Node Tuberculosis at CHU/JRA Laboratory, Antananarivo

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ABSTRACT

Introduction: Extra-pulmonary tuberculosis is the most frequent form of tuberculosis in children, especially in the lymph nodes. The aim of this study is to describe the histological and epidemiological profiles of lymph node tuberculosis in children at the Paraclinical Training and Research Unit in Anatomy and Cytology Pathology at CHU/JRA.

Method: This is a retrospective, descriptive study of cases of lymph node tuberculosis in children. The study was spread over a five-year period, from January 2017 to December 2021.

Results: During the study period, 80 cases were recorded. The children's ages ranged from 0.33 months to 15 years, with an average of 9.11 years and a peak in the 12-15 age group (n=31, 38.7%). A slight male predominance was observed, with a sex ratio of 1.1. The location was cervical in 86.3% of cases. The lesion was discovered in the majority of cases by the existence of adenopathy (97.5%), most often in the cervical region. The morphological appearance was typical of a tuberculoid granuloma in 96.3% of cases.

Conclusion: Extrapulmonary tuberculosis, including lymph node localization in children, is a public health problem in Madagascar. Anatomopathological examination remains a reliable and essential element for confirming the diagnosis and eliminating other differential diagnoses.

Typhoid (Enteric) Fever still remain a disease of major public health importance and of significant burden to our health service delivery: Typhoid have similar symptom with other infections such as fever, headache, diarrhea or constipation, abdominal pain, fatigue and anorexia, therefore, treatment should be based on adequate laboratory diagnosis. The emergence of antibiotic-resistant strains of *S. Typhi* is a growing concern, the need for appropriate antibiotic stewardship can never been over emphasized.

Keywords

Child, Lymph node, Tuberculoid granuloma, Tuberculosis.

Introduction

Tuberculosis is still a major public health problem worldwide, with over a million new cases each year in children under the age of 15, according to the World Health Organization (WHO) [1]. In Tunisia, extra-pulmonary localization has been increasing steadily

over the last decade [2]. In industrialized countries such as France, tuberculosis is rare, 14.6/105 inhabitants in 2015 [3]. Madagascar remains a country with a high incidence of tuberculosis. In 2020, the incidence of tuberculosis was estimated at 238 cases/100,000 inhabitants in Madagascar [4]. Most people become infected in childhood. The aim of this study was to determine the epidemiological-clinical and histopathological characteristics of lymph node tuberculosis in children under 15 years of age.

Material and Methods

This is a retrospective descriptive study, carried out over a 6-year period (2017 to 2022) at the Paraclinical Training and Research Unit Anatomy and Cytology Pathology of the CHU/JRA. Data were collected from anatomical pathology liaison forms and pathological examination reports. The study population consisted of children under 15 years of age with lymph node tuberculosis.

Results

During the study period, 80 histologically proven cases of lymph node tuberculosis were included. The mean age of patients was 9.16 with a standard deviation of 0.52, extremes of 0.33 and 15 years, and a peak in the 12 to 15 age group (n=31 or 38.7%), followed by 8 to 11 and 3 to 7 years with 20 cases (25%) and under 3 years (n=9 or 11.3%) respectively (Figure 1). A discrete male predominance was observed, with a sex ratio of 1.1 (Figure 2). Node location was cervical in n=69 or 86.3%, axillary in 5 cases (6.3%) and inguinal in 4 cases (5%) (Figure 3). Macroscopically, in 100% of cases, the lymph node section showed a typical yellowish-white, caseous lesion, typical of tuberculosis. In the majority of cases (n=77, 96.3%), the histological appearance was typical, with epithelioid and gigantocellular granulomas centered on caseous necrosis. In 3 cases (3.7%), necrotizing adenitis was considered compatible with tuberculosis.

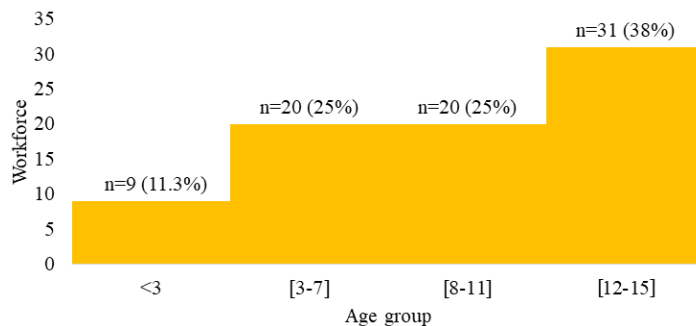


Figure 1: Distribution of cases by age group.

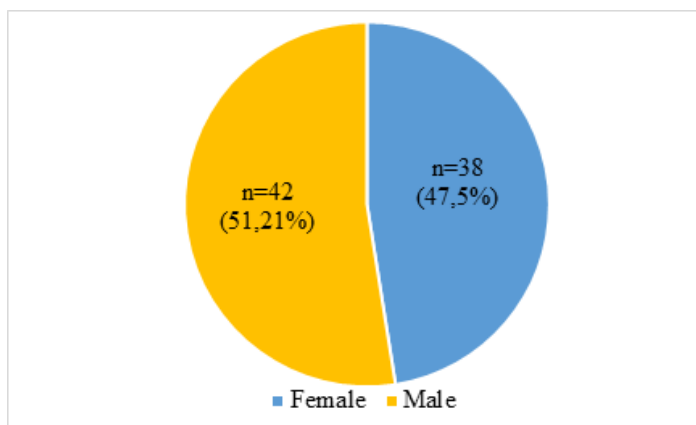


Figure 2: Distribution of cases by gender.

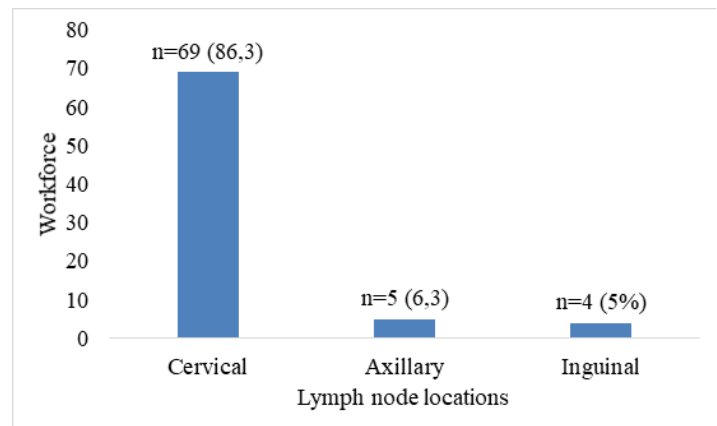


Figure 3: Distribution of cases by lymph node location.

Discussion

Nodal tuberculosis represents the most common form of extra-pulmonary tuberculosis in children. According to a Tunisian-German conference in 2017, the main location of Extra-Pulmonary Tuberculosis (EPT) worldwide was the lymph nodes [5]. In this study, 80 cases of lymph node tuberculosis out of 102 EPT were observed, representing 78.4 3% of cases. This corroborates with different series in the literature such as the one in Tunisia by Sfaihi L et al., in 2010 [9] and Ben M'hamed R et al., in 2013 [12] who each identified 70% cases of lymph node tuberculosis in children. On the other hand, it is higher than those of Sepúlveda EVF et al., in Colombia in 2017 [11], Zemour L et al., in 2018 in Morocco [10] who found respectively 40.6%, 60.9% of lymph node EPT in children. These differences, could be explained by several factors such as geographical distribution, the size of the population studied from one country to another...etc. The frequency of lymph node localization may be related to the pathophysiology of tuberculosis, since the lymph nodes are one of the immune organs that act when the germ penetrates and prevent hematogenous or lymphatic dissemination to other organs [13]. Node localization is also more easily detected clinically than other EPT sites. Symptoms such as enlarged lymph nodes may be more obvious and more likely to be detected. Symptoms such as enlarged lymph nodes may be more obvious, leading to earlier diagnosis. Lymph node tuberculosis is more common in children, in whom the lymph nodes play an active role in the immune response.

Age in this study ranged from 0.3 to 15 years. The mean age was 9.16 ± 0.52 , which is higher than that observed by Shah I, and Dani S with a mean age of 7.4 years and extremes of 1 and 14 years and that of Yasar Dirmus S et al with a mean of 88.7 months (i.e. 7.3 years) and extremes of 5 and 192 months (i.e. 0.41 to 16 years). The high mean age in the present study could be explained by the fact that symptoms of EPT may be more subtle than those of pulmonary TB, and it may be that older children are better able to report symptoms that could point towards TB. Hence the delay in diagnosis.

In terms of gender, a discrete male predominance was observed,

corroborating the result of Yasar Dirmus S et al. with 58.8% male [14]. In contrast, Shah I, and Dani S found a female predominance with 56.45% [15]. The predominance of males could be explained by the fact that, according to some authors, males have been shown to be more susceptible to infection by *Mycobacterium intracellulare* and *Mycobacterium marinum* [16].

In 97.5% of cases in this series, tuberculosis was manifested by a single or multiple adenopathy. It was associated with an altered general state of health in 2.5% of cases. This finding is similar to that reported in the literature. For Marrakchi C et al., in 2010 in Tunisia, adenopathy was the main symptom of lymph node tuberculosis [17]. According to Gonzalez Saldana N et al., in 2021 in Mexico, the most common symptoms were adenopathy and fever [18]. Yaşar Durmuş S et al., in Turkey objectified unilateral cervical adenopathy in the majority of cases [19]. According to Ketata W et al., in 2015 in Tunisia, in the early stage tuberculous adenopathies were painless, firm and mobile in relation to the deep and superficial planes. After a few weeks, they softened and sometimes fistulated to the skin. They could be single or multiple, sometimes confluent to form a voluminous, reddish, fistulized mass presenting a picture of *écrouelles* [20]. In this study, one case of fistulated ganglion and one of abscessed ganglion were noted.

With regard to lymph node location in this series, cervical lymph nodes were most frequently involved in 86.3% of cases. Kuissi Kangaing E et al., in 2018 in Gabon reported that adenopathies were a frequent reason for consultation in pediatrics, and the cervical region was the main site of lymph node tuberculosis, accounting for 51% of cases [21]. According to Stephan L et al., in 2014 in Germany, cervical lymph nodes were particularly important as they were the first drainage stations for key points of contact with the outside world, such as the mouth, nose, throat and respiratory system [13]. The predominance of cervical localization could also be explained by the easy accessibility of samples in this region. Macroscopically, caseous necrosis is initially yellowish-white, pasty and creamy, similar to cottage cheese, then turns grayish and may become impregnated with calcium. This caseous necrosis never resolves itself; it may soften and liquefy, remain in place or evacuate, leaving a cavity (cavern), or even dry out and calcify or encyst [22]. In the present study, the necrosis was early-onset, yellowish-white, pasty and of variable size, depending on the volume of the lymph nodes.

Histologically, in the present study, the lesion was an epithelioid granuloma with Langhans-type giant cells and caseous necrosis in 96.3% of cases. A study comparing the confirmatory histological appearance of lymph node tuberculosis noted the importance of the presence of granuloma with caseous necrosis in confirming the diagnosis, compared with the presence of granuloma alone [22]. Caseous necrosis consists of an eosinophilic, anhistiocellular, cracked, granular or homogeneous substance that may be complete or incomplete, with persistent nuclear debris [23]. Soumia K et al., in 2020 noted that necrotizing adenitis is nothing other than the evolution of the tuberculosis lesion. In

other words, it is the result of the progressive destruction of the koch bacillus [23]. According to Hui-Hua Li et al., necrotizing adenitis presents histologically as necrotizing granulomatous inflammation. It consists of a central necrotic zone surrounded by epithelioid histiocytes with a varying number of multinucleated giant cells. These giant cells may be of the Langhans type, with horseshoe-shaped nuclei at the periphery of the cytoplasm [24].

In the present study, necrosis had the same microscopic appearance, most often associated with multinucleated giant cells. In all cases of tuberculoid granulomatous inflammation, childhood EPT must be differentiated from the following pathologies: sarcoidosis, leprosy, other atypical mycobacteria, congenital syphilis and foreign-body reaction [23].

In 3.7% of cases, the appearance of the lesion was not typical, with only tuberculoid granulomas without caseous necrosis. In all cases of tuberculoid granulomatous inflammation.

In this study, necrotizing adenitis accounted for 3 cases. As Madagascar is a tuberculosis-endemic country, and as the patients also presented an alteration in their general state of health, the diagnosis of tuberculosis was retained without proposing other complementary biological examinations such as bacterial culture or BAAR testing, but these examinations could not be carried out due to a lack of financial resources. The geneXpert had only been available at the IPM (Institut Pasteur de Madagascar) for more than 5 years, according to the IPM's Laboratory Manager, i.e. before 2020, and was not affordable for all patients. Definitive diagnosis was made after patients had undergone anti-tuberculosis treatment.

Conclusion

Madagascar is one of the most tuberculosis-endemic countries in the world. Extrapulmonary tuberculosis remains a scourge in children, who are one of the disease's preferred targets. It has a predilection for males, and mainly affects the 12 to 15 age group. It is mainly found in the cervical region. The morphological appearance is typical in the majority of cases. In the presence of adenopathy in children, tuberculosis is one of the diagnoses to be considered. The geneXpert test has been available in Madagascar since the COVID 19 epidemic, and will be available in some public laboratories, such as those at CHU Anosiala, in 2022. The free availability of this test, combined with a low-cost Pathological Anatomy examination, could increase the number of patients diagnosed. In this way, diagnosis will no longer be based on therapeutic responses, but will be well founded before any treatment.

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