

Extra-pulmonary tuberculosis frequency and the risk factors influence (case of the PHE-Batna regional unit) (2017-2022)

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Abstract

Context: Tuberculosis is an infectious disease that is endemic in developing countries. The causal agent is *Mycobacterium tuberculosis*. Extra-pulmonary tuberculosis (EPTB) is receiving renewed attention due to an unexplained increase in its relative frequency. The aim of this study was to carry out a retrospective descriptive survey to assess the frequency of extra-pulmonary tuberculosis in an eastern Algeria population range.

Methods: this study took place at the regional tuberculosis Batna's Public hospitalian establishment unit; over a period of 64 months (2017-2022). 2405 files were studied through the collection of information recorded at laboratory level.

Results: Out of 2405 samples, 102 were positive (4.24%). There was a clear predominance of females (64.70%) and males (35.29%), giving a sex ratio of 1.8. The age group most affected was 11 to 49. Pus was the most common specimen with a percentage of 44.12%, followed by urine (28.43%), CSF (14.70%). The incidence of extra pulmonary tuberculosis in patients in Batna's Department and neighbouring Departments is 4.24%, with adult women being the most affected.

Conclusion: Extrapulmonary tuberculosis is common and should not be neglected; it is no longer a pathology of the past but still remains relevant today.

Keywords: Extrapulmonary Tuberculosis; East Algerian; Frequency; *Mycobacterium Tuberculosis*; PHE Batna.

1. Introduction

Tuberculosis is a transmissible infectious disease caused by *Mycobacterium tuberculosis* (bacillus Koch or BK). According to WHO estimates, it is one of the infectious diseases which causes the most deaths worldwide [1]. It is a major public health problem in developing countries [2]. The two types of clinical manifestations of tuberculosis (TB) are pulmonary tuberculosis (PTB) and extra pulmonary tuberculosis (EPTB), where the first is the more common [3]. Extrapulmonary tuberculosis owns numerous forms, mainly resulting from hematogenous propagation: lymph node, genitourinary, intestinal, bone, meningitis, pericarditis, peritonitis, laryngitis, and tuberculous otitis, the latter two rarely encountered. It is particularly common in immunocompromised individuals, mainly those infected with HIV [4]. However, TBEP can also occur in immunocompetent patients [5]. The aim of this study was to assess the frequency of extra pulmonary tuberculosis in an eastern Algerian population range

2. Materials and methods

This is a retrospective descriptive study of 2405 samples meeting the inclusion criteria (all patients with suspected extra-pulmonary tuberculosis who returned their samples to the tuberculosis unit), and exclusion criteria (patients with pulmonary tuberculosis) during the period from January 1, 2017 to April 30, 2022. The study took place at the tuberculosis unit, which is regional in nature, of the Batna's Public Hospitalian Establishment (PHE Batna).

The variables studied were :

- Sociodemographic variables : age, sex ;
- Type of sample: urine, cerebrospinal fluid, pus, synovial fluid, ascites fluid, biopsy, bone marrow puncture, menstrual blood and semen.
- Bacilloscopy results ;

Information was obtained from laboratory registers containing reports of bacteriological examinations with surname, first name, age, sex and nature of sample.

Data entry and analysis were performed using SPSS software.

3. Results

3.1. Frequency of sample positivity

During this period, of 2405 samples suspected of TBEP received at the tuberculosis unit, 102 were positive (4.24%), and 2303 were negative (95.76%) (Fig 1).

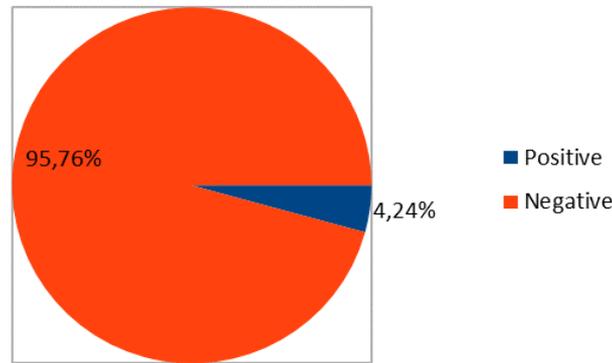


Fig. 1: Sample Positivity Frequency.

3.2. TBEP positivity by sex and age group

Women were the most affected by TBEP (64.70%) vs (35.29%) for men, i.e. a sex ratio of 1.8. Patient age was divided into 4 brackets (0-10, 11-49, ≥ 50, indeterminate), with 44 patients belonging to an indeterminate age bracket (43.13%), followed by the 11-49 age bracket (33.87%), then the ≥ 50 age category (18%) and finally children, who ranked last (5%) (Fig2).

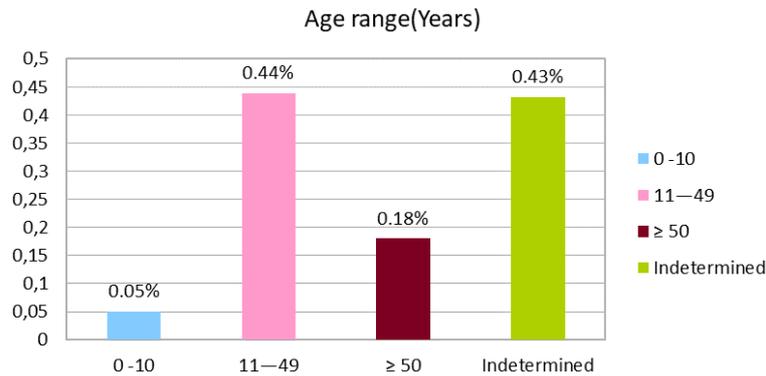


Fig. 2: TBEP Positivity by Age Group.

3.3. TBEP positivity depending on the nature of the sample

Pus was the most dominant specimen (44.12%), followed by urine (28.43%) and CSF (14.70%), followed by other specimens such as ascites fluid (7.84%), synovial fluid and biopsy (1.96%) each, and finally menstrual flow (0.98%) (Fig 3).

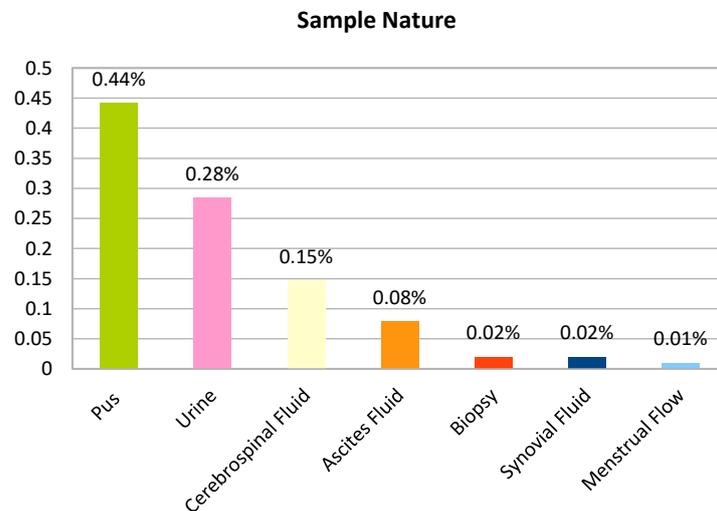


Fig. 3: TBEP Positivity According to the Sampling.

The results of this study showed that the culture of *Mycobacterium tuberculosis* on Lowenstein-Jensen media was the key to diagnosis.

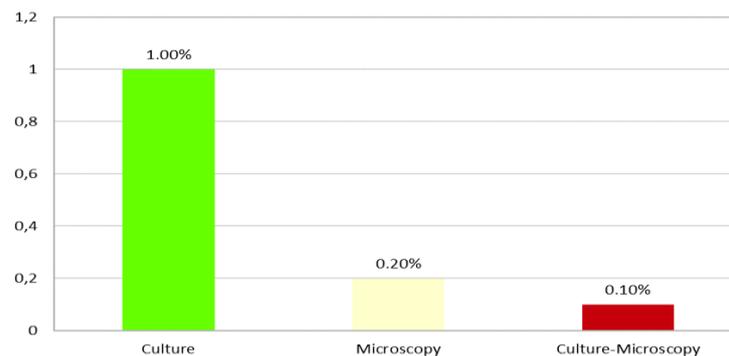


Fig. 4: TBEP Positivity According to the Diagnosis Method.

4. Discussion

In the present study, the frequency of positivity of samples received was 4.24%, a much lower rate than that reported in the literature (20-40%) [6]. Similar results to the present study were observed in India, where 230 of a total of 3,750 samples processed were positive for TBEP (6.1%) [5]. This could be explained by the high rate of pulmonary tuberculosis [7,8]. The predominance of females in the study corroborates several studies carried out in Algeria [9,10]. In fact, this female predominance may be linked to the social stigma associated with the disease, malnutrition and inadequate exposure to sunlight leading to vitamin D deficiency. Macrophages infected with *Mycobacterium tuberculosis* require 25-hydroxy vitamin D to initiate the immune response; when this level is < 20 ng/ml, the macrophage no longer provokes an immune response [11].

In our series we observed that adults were the most affected by EPTB compared with children, Gomes et al. In Brazil had found the same. Recent studies have reported that the localization of extra pulmonary tuberculosis is variable, which could be attributed to ethnic differences or associated diseases [13]. Pus was collected from a number of sites, and lymph nodes were the most predominant location, in line with literature data showing that lymph nodes are the site most affected by EPTB [14]. These results concur with those found in two studies in Algeria [15,16], while other studies have shown that lymph node localization comes in second place [17,18]. Culture remains the gold standard for diagnosing tuberculosis [19,20]. This may be due to the low number of tubercle bacilli present in the samples analyzed, which explains the low sensitivity of Ziehl-Neelsen staining. An included quantity between 5,000 and 10,000 bacilli/ml is required for detection of the germ by this type of staining [21].

5. Conclusion

Tuberculosis remains one of the most common infectious diseases and causes the most deaths worldwide. Extra-pulmonary tuberculosis is increasingly common, and has become a real public health problem, especially in developing countries such as Algeria.

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