

Epidemioclinical Aspects of Extrapulmonary Tuberculosis in the Paediatric Ward of the Donka National Hospital/Conakry University Hospital

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Summary

Introduction: Tuberculosis is an infection caused by Mycobacterium tuberculosis. Its extrapulmonary forms are numerous.

Method: This was a prospective descriptive study, lasting four years, from 1 February 2019 to 31 January 2023, carried out in the paediatric department of the CHU Donka. Our study variables were epidemiological, diagnostic and therapeutic.

Results: During our period, we counted 27 patients. The age group 11-15 years was most represented 40.74%, with an average age of 8.4 years. The male sex was the most represented 62.96% with a sex ratio of 1.7. Fever largely dominated the reasons for consultation, 70.37%. Eighteen (18) patients out of 25 had been vaccinated with BCG (66.67%). The TST and GeneXpert were very decisive in the diagnosis and meningeal tuberculosis dominated the picture (22.22%). Our patients were all treated with anti-tuberculosis drugs and the evolution was favourable (77.78%), 5 patients had died (18.52%).

Conclusion: Tuberculosis remains a significant pathology in our department despite BCG vaccination at birth.

Keywords: Extrapulmonary tuberculosis; Pediatrics; CHU Donka; Guinea-Conakry

Introduction

Tuberculosis, an infection caused by Mycobacterium tuberculosis, ranks 3rd among WHO priority diseases after malaria and HIV [1]. Worldwide, 9 million new cases are reported each year, including 1 million children under the age of 15 [2]. This is a real public health problem, especially in developing countries. Extrapulmonary forms account for 10 to 42% of tuberculosis [3]. Despite the tireless efforts of our country's expanded programme on immunization in BCG vaccination coverage, tuberculosis continues to make its way among the diseases in Guinean paediatric hospitals. GeneXpert's contribution to the identification of certain forms of extrapulmonary tuberculosis remains an important element of our service. This review allowed Kolié O. et al. to detect eight (8) cases of meningeal tuberculosis for the first time in the ward [4]. The gradual increase in cases of extrapulmonary tuberculosis in the ward according to hospitalization records motivated this study. Our objectives were to describe the epidemiological, clinical and evolutionary aspects.

Patients and Method

This was a prospective, descriptive study lasting three (3) years, from 1 February 2020 to 31 Jan 2023, carried out in the Pediatrics Department of the Donka University Hospital. All children aged 0 to 15 years admitted to the extrapulmonary tuberculosis department were included in this study. The parameters collected and analyzed were age, sex, history (BCG vaccination and concept of tuberculosis contagion), main clinical manifestations, certain paraclinical examinations (Telethorax, IDR, Xpert, HIV status, blood count, brain scan) and evolution. Our data has been processed by the Epi-info software version 7.0, entered using the Word and Excel software of the office 2016 package. Informed consent was obtained from parents interviewed. They were reassured about the anonymity and confidentiality of the information collected. We considered in this work IDR positive (+), all cases of IDR ≥ 10 mm in patients not vaccinated with BCG at birth or immunocompromised and ≥ 15 mm in patients vaccinated with BCG and not in contact with a tuberculosis patient.

Results

During our period, we identified 27 patients. The 11-15 age group was more represented 40.74%, with an average age of 8.4 years. The male sex was the most represented 62.96% with a sex ratio of 1.7 (Table I). Fever largely dominated the table of reasons for consultation, 70.37%, followed by weight loss (4 0.74%) and physical asthenia (37.04%). Six (6) patients had bilateral mydriasis or 22.22% and 2 patients had puffiness of the face and edema of the lower limbs (7.41%) (Table II). Eighteen (18) patients had been vaccinated with BCG (66.67%) and nine (9) had not received their vaccine at birth (33.33%); only 3 patients had a notion of tuberculosis contagion (11.11%) (Table III). The RDI and GeneXpert were instrumental in the diagnosis of extrapulmonary tuberculosis in this study (Table IV). We recorded six (6) cases of subarachnoid tuberculosis (22.22%), five (5) cases (18.52%) of pleurisy and ascites, four (4) cases of lymph node tuberculosis (14.81%), 2 cases of pericarditis (7.41%) and one case (4%) each of nephrotic syndrome, renal failure, peritonitis, cutaneous and osteoarticular tuberculosis on SS sickle cell disease (Table V). Our patients were all subjected to anti-tuberculosis treatment according to the national protocol and the evolution was favourable in twenty-one (21) patients (77.78%) and unfavourable in 6 patients including one case of neurological sequelae (Epilepsy) (3.70%) and 5 deaths (18.52%); including 4 cases of meningeal tuberculosis (80%) and one case of renal failure (20%) (Table VI). One in six (6) patients with subarachnoid tuberculosis presented hydrocephalus on CT (Fig.1).

<i>Epidemiological characteristics</i>	<i>Number of cases (N=27)</i>	<i>Percentage</i>
Age groups		
0-5 years	8	29,63
6-10 years	8	29,63
11-15 years	11	40,74
Median age = 8.4years	Extreme ages: 1-15 years old	
Sex		
Masculin	17	62,96
Feminine	10	37,04
Sex-ratio (H/F) = 1,7		

Table 1: Distribution of the 27 patients according to epidemiological characteristics.

Clinical features	Number of staff (N=27)	Percentage
Reason for consultation		
Fever	19	70,37
Emaciation	11	40,74
Physical asthenia	10	37,04
Abdominal bloating	6	22,22
Difficulty breathing	6	22,22
Abdominal pain	5	18,52
Chest pain	5	18,52
Convulsive seizures	5	18,52
Convulsive seizures	3	11,11
Puffiness of face	3	11,11
Cough	2	7,41
Physical signs		
Costal draw	14	51,85
Difficulty breathing	8	29,63
Geignement	7	25,92
Bilateral mydriasis	6	22,22
Neck stiffness	5	18,52
Silence to thecultatory s	5	18,52
Lymphadenopathy	4	14,81
Inability to eat	3	11,11
Face puffiness + OMI	2	7,41

Table 2: Frequency of clinical signs encountered in the 27 patients.

Background	Number of staff (N=27)	Percentage
Vaccination/BCG		
Yes	18	66,67
Not	9	33,33
Concept of storytelling		
Not	24	88,89
Yes	3	11,11

Table 3: Distribution of 27 patients by history.

Complementary examinations	Number of staff (N=27)	Percentage
Hémogramme, CRP, VS, SRV	27	100
Tuberculin RDI*	22	77,78
Téléthorax	16	59,26
GeneXpert*	10	37,04
Bacteriology + CSF chemistry	4	14,81
Scanner abdominal	2	7,41

Tuberculin RDI*: We performed it in 22 patients and it was positive (+) in 19 patients. GeneXpert was positive in 6 patients.

Table 4: Frequency of complementary examinations in the 27 patients.

<i>TBC extrapulmonaires</i>	<i>Actual</i>	<i>Percentage</i>
Meningeal tuberculosis	6	22,22
Pleurésiand	5	18,52
Ascites	5	18,52
Tuberculosis lymph node	4	14,81
Pericarditis	2	7,41
Secondary nephrotic syndrome*	1	3,70
Renal tuberculosis (IR*)	1	3,70
TBC ostéoarticulaire	1	3,70
Cutaneous TBC	1	3,70
Tuberculous peritonitis	1	3,70
Total	27	100

Secondary nephrotic syndrome*: Nephrotic syndrome secondary to infection with Mycobacterium tuberculosis.
IR*: Renal failure.

Table 5: Distribution of 27 patients by extrapulmonary forms of tuberculosis.

<i>Evolution</i>		<i>Actual</i>	<i>Percentage</i>
Favorable		21	77,78
Unfavourable	Death*	5	18,52
	Sequelae (epilepsy)	1	3,70
Total		27	100

Deaths*: 4 deaths due to tuberculous meningitis (80%) and 1 death due to renal failure (20%).

Table VI: Distribution of the 27 patients according to the evolution.

Iconographic Images

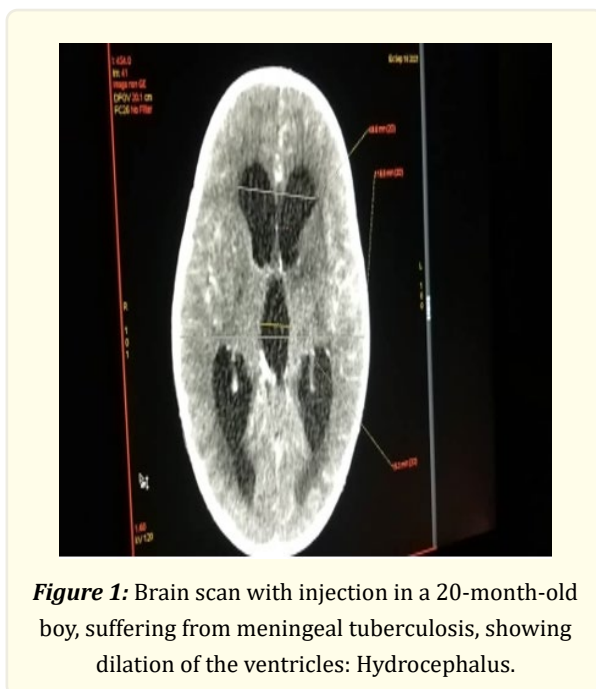


Figure 1: Brain scan with injection in a 20-month-old boy, suffering from meningeal tuberculosis, showing dilation of the ventricles: Hydrocephalus.



Figure 2: Pleural drainage using 3-way tubing in a 5-year-old boy with tuberculous pleurisy.

Discussion

The main difficulty encountered was the non-realization of the IDR and GeneXpert in the laboratory of our national hospital at the time of the study. The average age was 8.4 years with extremes of 1 to 15 years. The 11-15 age group was the most represented (40.74%), followed by the 0-5 age group (29.63%). The 0-4 age group was the most represented in the series of Soumana A. et al. (50%) [5]. Infectious diseases are very common before the age of 5 because of the weakness of their immune system. Our result could be explained by the fact that in our country the national protocol requires the initiation of anti-tuberculosis treatment for all children under 5 years of age living in a family where tuberculosis is declared. The sex ratio was 1.7 in favour of boys. For a period of 11 years, Elmghari M. et al. reported male predominance (61%) out of 285 children admitted for extrapulmonary tuberculosis [6]. Clinically, fever topped the table with 70.37%, followed by weight loss (40.74%) and physical asthenia (37.04%). These three (3) signs are common in TB studies. Soumana A. et al. reported in order Fever 26%, weight loss (16%) and asthenia (10%) [5]. The discovery of mydriasis in six (6) of our patients (22.22%) was an important element of orientation towards meningeal tuberculosis because intracranial hypertension by hydrocephalus remains a frequent complication during this disease [7]. Eighteen (18) of our patients (66.67%) were BCG vaccinated. Many TB studies have noted that more than half of their patients were vaccinated with BCG at birth [5, 6, 8]. This further calls into question the notion of lifetime coverage of BCG vaccination. The discovery of tuberculosis in children is easy if the notion of storytelling is elucidated, especially if it is part of the family. In our study, only 3 patients had a notion of contagion. This sometimes makes it difficult to diagnose this disease early in the paediatric population. This is why today there are several means of diagnosis; in our study, IDR and GeneXpert were very decisive in establishing the diagnosis of our patients. The RDI was greater than 12mm in our patients. Among the forms of extrapulmonary tuberculosis recorded, meningeal tuberculosis ranked first (22.22%), followed by tuberculosis ascites and pleurisy in equal proportion (18.52%), lymph node tuberculosis (14.81%). The frequency of clinical forms depends from one study to another. In the department, prior to our study, Barry I. et al. successively found lymph node, multifocal, osteo-articular and peritoneal forms [9]. Elmghari M. et al. found lymph node, pleural, peritoneal, cutaneous, meningeal, hepatic, bone, renal and pericardial forms in descending order [6]. In our case, for the first time in the ward, we discovered a case of nephrotic syndrome

with tuberculosis, cases of cutaneous and osteoarticular tuberculosis on SS sickle cell disease, a case of tuberculous renal failure. The nephrotic syndrome in this study involved a 15-year-old patient who was received in an anasarca chart with RDI equal to 18mm and a normal chest X-ray. Although we were unable to establish the correlation between nephrotic syndrome and tuberculosis, our study is similar to that of Moyen G. et al. who recorded 36 cases of nephrotic syndrome, one case of pulmonary tuberculosis [9]. The correlation between nephrotic syndrome and tuberculosis will need to be studied in the service at a later stage. Major sickle cell syndrome remains a field exposed to infectious complications and blood culture remains a serious examination for the detection of germs but the high cost of its realization in our country means that not all parents of children have access. However, the RDI allowed us to discover 2 cases of extrapulmonary tuberculosis in 2 sickle cell patients. All 15 years old, the first patient, sickle cell SS, had persistent bone pain for several days despite our protocol for the management of children with sickle cell disease. The second, sickle cell SC, had a wound on the anterior surface of his right leg. This wound resisted dressings for 9 months despite even the associated osteomyelitis treatment. Standard X-ray showed no bone involvement in these 2 patients. The IDR gave 18mm in the first and 20mm in the second. We therefore concluded that bone tuberculosis and cutaneous tuberculosis on sickle cell disease respectively. Improvement in their condition began one week after starting TB treatment. In the literature, it is recommended to consider the positive RDI from 5 mm in immunocompromised patients, patients with chronic renal or hepatic impairment [10]. Few data in the literature speak of bone tuberculosis in children with sickle cell disease. Out of 137 children with tuberculosis, Tshilolo L. et al. reported 9 cases of Pott's disease, including 6 cases in children with sickle cell disease [11]. The GeneXpert of biological secretions was very decisive in the diagnosis of extrapulmonary forms of tuberculosis in our study. The literature recommends it as a first-line treatment in certain forms of tuberculosis such as meningeal tuberculosis [12]. Our patients were all on TB drugs according to the national protocol. Cases of pleurisy were drained into the ward using the 3-way tubing (Fig.2). A material easy to use, with a very affordable price and causing no complications after the puncture; material that we learned its use during our passage for academic internships in the pneumotysiology department (on behalf of the diploma of specialized studies of Pediatrics). Prior to this placement, all cases of pleurisy were transferred to the thoracic surgery department. The evolution was favorable in 77.78% of cases, five (5) patients had died including 4 cases of meningeal tuberculosis (80%) and one case of renal failure (20%). One in six (6) patients of subarachnoid tuberculosis presented to the CT scan with hydrocephalus, which remains a common complication in the meningeal muclosis tube. Karande S et al. reported that hydrocephalus and ischemia were the most common complications in their study [13]. Meningeal tuberculosis remains a very dangerous disease. All authors agree on the inevitability of the evolution of this disease [14, 15, 16].

Conclusion

Tuberculosis remains a pathology not to be neglected in our department despite the high rate of children vaccinated with BCG at birth. The IDR and GeneXpert have shown a prominent place in the detection of extrapulmonary forms of tuberculosis in the ward and we believe that this study can serve health workers to improve the management of sick children.

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