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Ischemic Stroke Complicating Neuromeningeal and Pulmonary Tuberculosis in Children: About a Case in Senegal

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Abstract

Tuberculosis is a major public health problem, especially in developing countries. Neuro-meningeal involvement is rare but represents one of the most severe forms with high morbidity and mortality. We report the case of an ischemic stroke complicating neuromeningeal and pulmonary tuberculosis in a four-month-old infant at the National Hospital Center of children Albert Royer (Senegal). The case was a four-month-old, male infant with no history. His vaccination was up to date according to Senegal's expanded vaccination program. There was no notion of tuberculosis contagion. He was seen for a prolonged fever for more than a month and chronic cough. He had moderate malnutrition. Neurological examination revealed coma, meningeal syndrome, generalized tonic convulsions and hypertonia. The pupils were in bilateral miosis. Osteotendinous reflexes were abolished with a bilateral Babinski sign. He also had severe respiratory distress, bilateral pulmonary condensation syndrome. Brain computed tomography was in favor of an ischemic stroke. The test GeneXpert MTB/RIF was positive on cerebrospinal fluid and gastric tubing fluid. The curative treatment was based on a quadruple therapy based on rifampicin, isoniazid, pirazinamide and ethambutol. The evolution was unfavorable with the death of the patient.

Keywords

Tuberculosis, Meningitis, Child, Senegal

1. Introduction

Tuberculosis is a major public health problem, especially in developing coun-

tries. Neuro-meningeal involvement is rare but represents one of the most severe forms with high morbidity and mortality. The World Health Organization (WHO) reports in 2022 an increase in the incidence and mortality linked to tuberculosis during the Covid-19 pandemic [1]. In Senegal, this increase in cases of tuberculosis and especially severe forms is encountered in practice without reliable epidemiological benchmarks. We report the case of an ischemic stroke complicating neuromeningeal and pulmonary tuberculosis in a four-month-old infant at the National Hospital Center of child Albert Royer (Senegal).

2. Observation

This was a four-month-old male infant with an unremarkable perinatal history. He had normal psychomotor development. His vaccination was up to date according to Senegal's expanded vaccination program. There was no notion of tuberculosis contagion.

He was received for a prolonged vespero-nocturnal fever for more than a month, associated with a chronic cough. He presented with moderate malnutrition with a weight of five kg (−3 and −2 z score), a height of 58 cm (−3 and −2 z score), an arm circumference of 11.8 cm (−2 z score). His head circumference was normal (−1 and median z score). Neurological examination revealed a coma with a Glasgow score of 7/15, meningeal syndrome and generalized tonic convulsions. His limbs were in hyperextension, the arms in abduction and the wrists in internal rotation (**Figure 1**). The pupils were in bilateral miosis. Osteotendinous reflexes were abolished with a bilateral Babinski sign. The anterior fontanel was normal.

He also had severe respiratory distress with 89% hypoxia, bilateral pulmonary condensation syndrome. The lymph node areas were free without hepato-splenomegaly.

Figure 1. Appearance in generalized hypertonia.

The chest X-ray showed bilateral opacities, poorly systematized with air bronchogram and a cavern at the expense of the right middle lobe (Figure 2).

Brain scan found a range of right hemispheric cortical subcortical hypodensity not enhanced by the contrast product, confirming an ischemic cerebrovascular accident (Figure 3).

The study of the cerebrospinal fluid revealed a macroscopically clear fluid, hyperproteinorachia at 2.01 g/l, hypoglycorachia at 0.16 g/l with capillary blood sugar at 0.92 g/l and pleocytosis at 252 leukocytes/mm^3 with 90% lymphocytosis. The test GeneXpert MTB/RIF was positive on cerebrospinal fluid and gastric tubing fluid. The investigation of an innate immune deficiency and the retroviral serology were negative. The complete blood count showed hypochromic microcytic anemia. C-Reactive Protein (CRP) was positive at 106 mg/l. The blood ionogram revealed hyponatremia at 129 mmol/l. The thick film in search of plasmodium

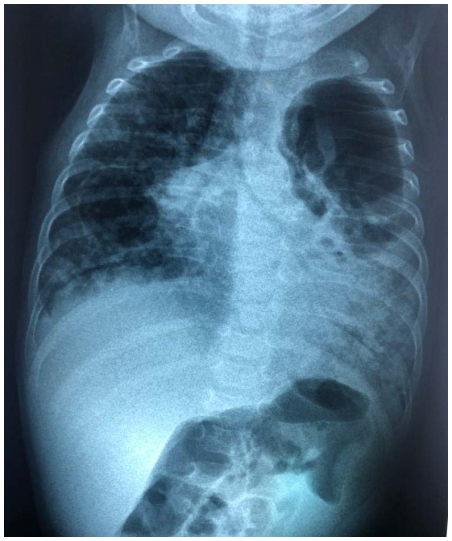

Figure 2. Frontal chest X-ray: bilateral opacities predominant on the left, poorly systematized with air bronchogram and a cavern at the expense of the right middle lobe.

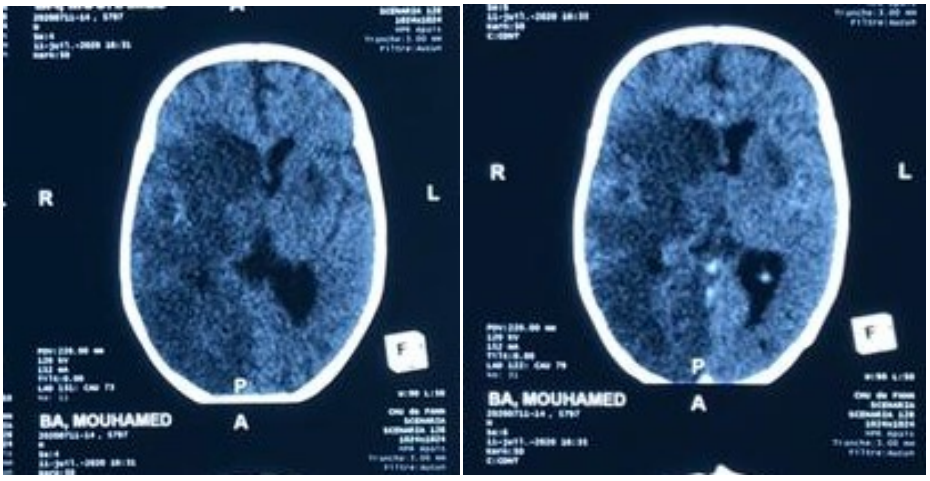

Figure 3. Cerebral computed tomography without and with contrast product in favour of an ischemic stroke.

was negative. The thrombosis and liver assessments were normal. The search for acid-alcohol-fast bacillus (AFB) on the mother's sputum was positive. Finally mother-chid contact was the mode of transmission in our patient.

The diagnosis of pulmonary and neuro-meningeal tuberculosis complicated by an ischemic cerebrovascular accident was retained.

Emergency treatment was instituted with hypnovel at 0.1 mg/kg, paracetamol at 60 mg/kg/day and oxygen therapy with glasses at 3 l/min. The curative treatment was based on a quadruple therapy based on rifampicin (15 mg/kg), isoniazid (10 mg/kg), pirazinamide (35 mg/kg) and ethambutol (20 mg/kg). Corticosteroid therapy with prednisolone at 2 mg/kg orally was instituted associated with adjuvant treatment. Vitamin B6 supplementation was done.

The evolution was unfavourable, marked by worsening respiratory distress, severe impairment of consciousness, convulsive status epilepticus. The patient died after 15 days of hospitalization.

3. Discussion

Children and young adolescents account for approximately 11% of TB cases. Half of them are under five years old [2]. Severe forms of tuberculosis are more common in young children [3] [4]. Central nervous system involvement is one of the most severe manifestations of tuberculosis. Our patient was less than five years old and presented a state of malnutrition, which is a risk factor for the occurrence of tuberculosis in children [5].

Tuberculosis meningitis is manifested by a febrile meningeal syndrome, disturbances of consciousness, convulsions with signs of neurological localization. The cerebrospinal fluid is classically clear with lymphocyte predominance. Chemistry reveals hypoglycorachia and hyperproteinorachia. Isolation of Mycobaterium tuberculosis from the cerebrospinal fluid confirms the diagnosis with certainty [6]. These elements were found in our patient.

Cerebral computed tomography occupies an important place in the diagnosis and in the search for complications of tuberculous meningitis [7] [8]. It revealed an ischemic stroke in our patient.

Tuberculous meningitis is most often secondary to hematogenous dissemination of Mycobacterium tuberculosis, most often from a pulmonary focus [9]. Pulmonary tuberculosis was found in our patient.

The management of our patient was based on the recommendations of the World Health Organization (WHO) with the association rifampicin, isoniazid, pirazinamide and ethambutol for two months followed by the association rifampicin and isoniazid for ten months [2].

The evolution was unfavorable with the death of our patient, which confirms the severity of tuberculous meningitis.

4. Conclusion

The high morbidity and mortality of serious forms of tuberculosis are the fear of

this pathology. The Covid-19 pandemic has disrupted vaccination programs. Chemoprophylaxis of child contacts remains important.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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