

Congenital Miliary Tuberculosis in a Neonate Born to a Mother Diagnosed with Tuberculosis after Delivery

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Congenital tuberculosis (TB) is extremely rare; however, early treatment is crucial to improve prognosis. A 26-day-old male neonate was admitted to the hospital with a 5-day history of fever, cough, and respiratory distress. The newborn was separated from the mother at birth and was not breastfed, as the mother was discharged from the hospital. The mother was diagnosed with miliary TB after delivery, and sputum was positive for acid-fast bacilli. Chest radiography and abdominal computed tomography (CT) revealed a miliary pattern, with nodular infiltrates in both lungs in the mother and newborn. Congenital TB was suspected based on the maternal history of TB. Congenital TB was further confirmed by DNA polymerase chain reaction of the gastric aspirate and sputum culture. Early diagnosis and timely treatment yielded positive outcomes in the newborn. This case report underscores the importance of assessing the maternal history of TB and detecting nodular infiltrations on chest radiography to improve the management of infants with suspected TB. Chest radiography and abdominal CT for the early diagnosis of TB improve the management and prognosis of this condition.

Keywords: Congenital Tuberculosis, Neonates, Pregnant Women, Computed Tomography, Antitubercular Therapy

Introduction

Congenital or neonatal tuberculosis (TB) is extremely rare, with only 358 cases described in the literature until 1995 and 18 cases reported from 2001 to 2005 (Hassan et al 2006). The early

diagnosis of congenital TB is important because of its non-specific presentation. Mortality from congenital TB is considerably high because of delayed diagnosis and treatment (Hassan et al 2006, Cantwell et al 1994).

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The high rate of TB among pregnant women in developing countries is associated with a greater risk of congenital TB. Approximately 20% of pregnant women who give birth to neonates with TB have no symptoms or non-specific symptoms (Ormerod 2001). Most of these women remain undiagnosed or are misdiagnosed until TB diagnosis is confirmed in newborns.

Here, we report the case of a neonate with congenital TB whose mother was asymptomatic until 37 weeks of gestation and was diagnosed with TB after delivery.

Case report

A 26-day-old male neonate, the first child of a 31-year-old woman, was admitted to the hospital with a 5-day history of fever, cough, and respiratory distress. He was delivered via normal vaginal delivery at 38 weeks of gestation and weighed 3,120 g. The following findings were reported at birth: temperature, 38.6°C; heart rate, 164 beats/min; respiratory rate, 66 breaths/min; blood pressure, 94/72 mm Hg; and O₂ satu-

ration, 90%. Apgar scores were 7 and 8 at 1 and 5 min, respectively. Within 24 h of birth, he received Bacille Calmette-Guerin vaccination. Respiratory distress was manifested as tachypnea with intercostal and subcostal retractions; on pulmonary auscultation, breath sounds were coarse. Other physical examination results were normal. Abdominal ultrasonography showed no organomegaly.

The results of hematological and biochemical tests were as follows: hemoglobin, 13.6 g/dL; leukocytes, $13.2 \times 10^9/L$ (neutrophils, 56.7%; lymphocytes, 31.6%; eosinophils, 6.3%; and monocytes, 5.4%); platelets, $400 \times 10^9/L$; C-reactive protein (CRP), 51 mg/L; and erythrocyte sedimentation rate (ESR), 18.6 mm/h. Serum electrolytes and hepatic and renal function test results were unremarkable. Serological results were negative for herpes simplex virus, cytomegalovirus, and human immunodeficiency virus (HIV). Chest radiography revealed a typical miliary pattern, with nodular infiltrates in both lungs, suggestive of congenital TB (Fig. 1).

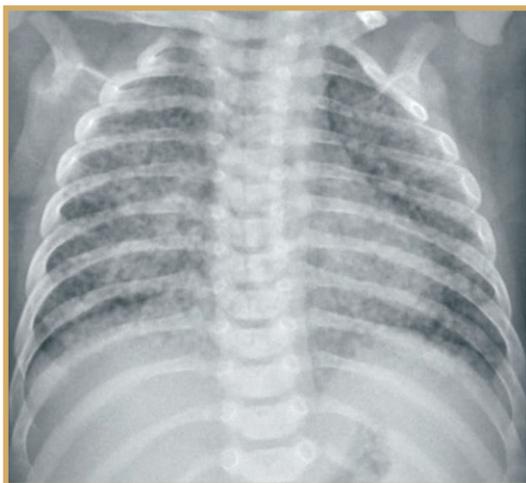


Fig. 1 : Typical miliary pattern on a chest radiograph of child, with nodular infiltrates in both lungs.

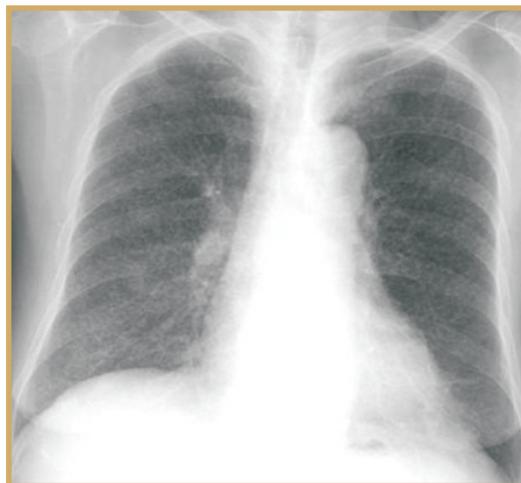


Fig. 2 : Miliary pattern on a chest radiograph of mother, with nodular infiltrates in both lungs.

Given the severity of the symptoms and the risk of developing severe TB, antitubercular therapy (ATT) was initiated on the third day of hospitalization with 15 mg/kg/day isoniazid, 15 mg/kg/day rifampicin, and 30 mg/kg/day pyrazinamide. Ethambutol was not prescribed because of its propensity to cause ocular toxicity, which cannot be assessed in newborns. Gastric lavage and sputum were collected on two consecutive days using a suction catheter, and a sputum smear was positive for acid-fast bacilli. DNA polymerase chain reaction (AMPLICOR *Mycobacterium tuberculosis* test, Roche) confirmed the *Mycobacterium tuberculosis* (MTB) in the gastric aspirate and sputum culture. The neonate was discharged 3 weeks after clinical stabilization. Pyrazinamide treatment was discontinued after 2 months of therapy, and isoniazid and rifampin were administered for 9 months. Imaging examinations performed during a 1-year follow-up showed no recurrence.

The child's mother had no history of contact with TB and was healthy. She was admitted to the hospital with fever and a non-productive cough at 37 weeks of gestation. Blood tests revealed the following findings: leukocytes, $14.8 \times 10^9/L$ (neutrophils, 78.4%; lymphocytes, 15.6%; eosinophils, 5%; monocytes, 1%); CRP, 112.6 mg/L; and ESR, 21.2 mm/h. The results of serological tests were negative for HIV infection. Chest radiography revealed miliary nodules in both lungs, suggestive of pulmonary TB (Fig. 2), and sputum was positive for acid-fast bacilli. MTB was confirmed by DNA polymerase chain reaction (AMPLICOR *Mycobacterium tuberculosis* test, Roche), and she was diagnosed with miliary TB and given a 6-month ATT with high doses of isoniazid, rifampicin, pyrazinamide, and ethambutol. After delivery, the neonate was separated from the mother and was not breastfed as the mother was discharged from the hospital.

Discussion

Congenital TB is diagnosed when TB is transmitted before birth through the bloodstream (via the umbilical vein) or at birth by aspiration of infected amniotic fluid (Miller 1982). Primary TB involves the respiratory system (lungs) or gastrointestinal tract, followed by the formation of a primary complex in the liver (Ormerod 2001, Cantwell et al 1994).

Neonates with congenital TB present atypical chest X-ray and CT findings (Starke 1997). Chest radiography showed a typical miliary pattern, with multiple nodules in the lungs (Peng et al 2011), suggestive of progressive TB. In our case, most of the clinical manifestations and chest X-ray findings were suggestive of congenital TB, and postnatally acquired TB was less likely because of the initial TB manifestations. Thus, our case met the diagnostic criteria established by Cantwell et al (1994).

Congenital TB can involve many organs and has different manifestations, including fever (48%), respiratory distress (72%), hepatosplenomegaly (76%), and lymphadenopathy (38%) (Cantwell et al 1994).

ATT is indicated for infants with congenital TB. In our case, pyrazinamide was discontinued after 2 months of treatment, and isoniazid and rifampin were administered for 9 months. Imaging examinations performed during a 1-year follow-up revealed no recurrence.

In 60% of cases, TB is transmitted from mothers to neonates (Hageman et al 1980). Newborns are at an increased risk of congenital TB in cases in which mothers have extrapulmonary, miliary, or meningeal TB (Bruchfeld et al 2002). In our case, the mother was diagnosed with miliary TB when the infant was in the recovery period.

The results of this case report underscore the need to standardize the screening, diagnosis, and

treatment of TB in the antenatal period to prevent severe disease and reduce perinatal mortality.

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