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Case Report

Primary Pulmonary Tuberculosis in Infancy- A Case Report

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ABSTRACT

Tuberculosis (TB) remains a challenge because severe forms occur most frequently in children under five years and diagnosis is complex. As early diagnosis and treatment appear to prevent complications and reduce mortality, paediatricians should be alert for tuberculosis in infants with an atypical picture suggestive of infection. We report on a 3-and-a-half-month old male infant, living in Sylhet, who presented with a fever and non-productive cough, treated as pneumonia without clinical improvement, and diagnosed later on as primary tuberculosis. This case highlights the rare presentation of tuberculosis in infancy.

Keywords: *Primary tuberculosis, Infant.*

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INTRODUCTION

The World Health Organization (WHO) estimates that 1 million children worldwide (<15 years old) are currently infected with tuberculosis (TB), with more than 136,000 dying each year[1,2]. Every day, up to 200 children die from TB, though it is a preventable and curable disease. Over half a million children fall ill with TB each year and struggle with treatment[2]. It has been observed that 15-20% of all TB cases in high-burden TB countries are among children, whereas 2-7% of all TB cases are estimated to be among children in low-burden TB countries[3].

TB remains a major public health problem in Bangladesh. Although there is no estimate on the prevalence of childhood TB, it is believed that childhood TB is severely under-diagnosed[4].

TB in children commonly presents with fever and failure to thrive, but these are non-specific. In most cases, children with symptomatic TB develop chronic unremitting symptoms (Symptoms persist for >2 weeks even after appropriate treatment). In general, TB is a slow-developing chronic disease, but it may present acutely in young and HIV-infected children. However, TB in children can manifest in various ways in different age groups, like pneumonia in <1 year of age, with a chronic cough in 1-9 years of age and in adolescents it is presented as in adults[1].

The diagnosis of tuberculosis is more difficult in children, especially when symptoms are often subtle, chest images are less specific, standard sputum samples can rarely be collected, and children have lower bacterial loads, making mycobacterial recovery more difficult. Infants and young children are at much higher

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risk of developing disseminated infection after primary tuberculosis, particularly tubercular meningitis, which has the highest mortality rate. Child-to-child transmission is rare because of lower bacterial loads. Children usually acquire infections from infected parents or household contacts, so family and close contacts should always be screened. In the absence of a known adult source case, the diagnosis of tuberculosis in children can be difficult[5].

Here we report an infant with pulmonary TB without a contact history, initially diagnosed and treated as pneumonia.

CASE REPORT

A 3½ month old non-immunized male baby, the only issue of his non-consanguineous parents, was admitted to a private hospital on 19/11/2020 with complaints of fever and cough for 1 month and respiratory distress for 2 days. The fever was initially low grade but became high grade and intermittent in nature for the last 8 days. The cough was non-productive in nature with no diurnal variation. He had no history of vomiting, convulsions, weight loss, altered bowel or bladder habits, and contact with TB patients, or travelling to malaria or kala-azar endemic zones. He was diagnosed with pneumonia and treated with several courses of oral and injectable antibiotics without significant improvement. On examination, he was found febrile (Temperature 103^0F), mildly pale, BCG mark was absent, no lymphaedenopathy, weight 4.5 kg, which lies just below the 5th centile, R/R was 52 breaths/min, chest indrawing was present, trachea was centrally placed, percussion note was dull in the right 3rd and 4th intercostal space (ICS) in the midclavicular and midscapular line, breath sound was bronchial in the right 3rd & 4th ICS with no added sound. Other systemic examinations revealed no abnormalities. His CBC report was normal, ESR was 24 mm in the 1st hour, CRP was 15 mg/l. CXR showed patchy opacities involving the major portion of the right lung. Treatment started with oxygen inhalation, antipyretic and empirical broad spectrum injectable antibiotics. As there were no clinical improvements, HRCT for the chest was done, which showed a right-sided cavitary lesion, collapse, consolidation and minimal pleural effusion suggestive of tuberculosis. After that, gastric lavage for Gene Xpart and HIV screening tests were done. Gene Xpert was found to be positive for MTB. The HIV screening test was negative. Then anti TB drugs (3FDC+Ethambutol) were started and the patient showed gradual clinical improvement and he was discharged with anti TB drugs for 6 months. He followed up on the 7th day after discharge and within this time, his clinical symptoms completely disappeared.

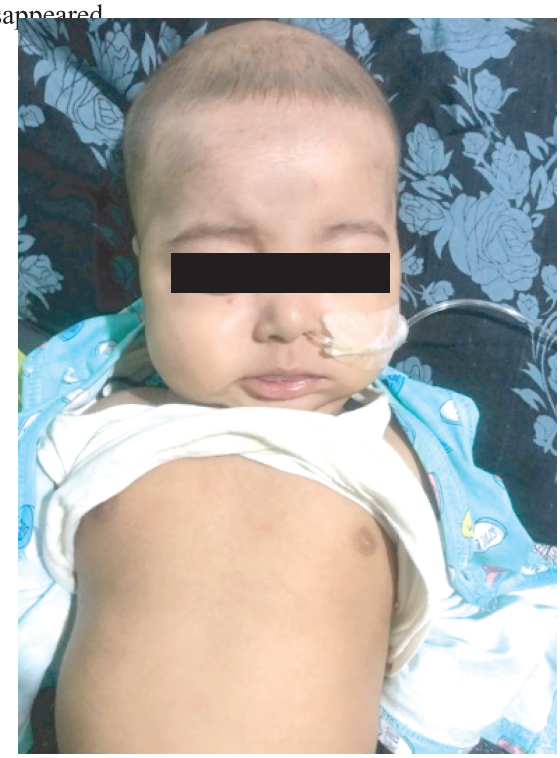

Figure-1: *The baby presented with Recurrent RTI*

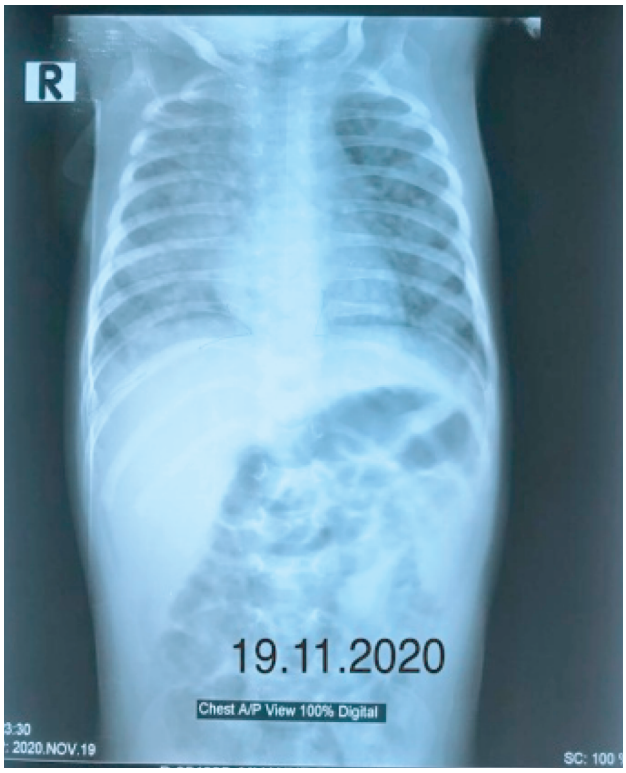

Figure-2: *CXR showing right sided patchy opacities*

Figure-3: *HRCT of chest was suggestive for TB.*

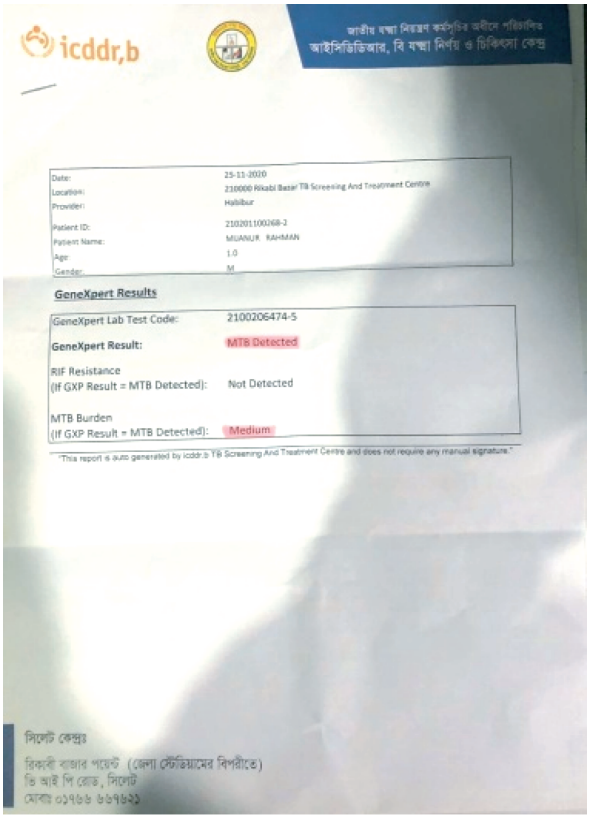

Figure-4: *Gastric lavage for Gene Xpart report showing positive for MTB.*

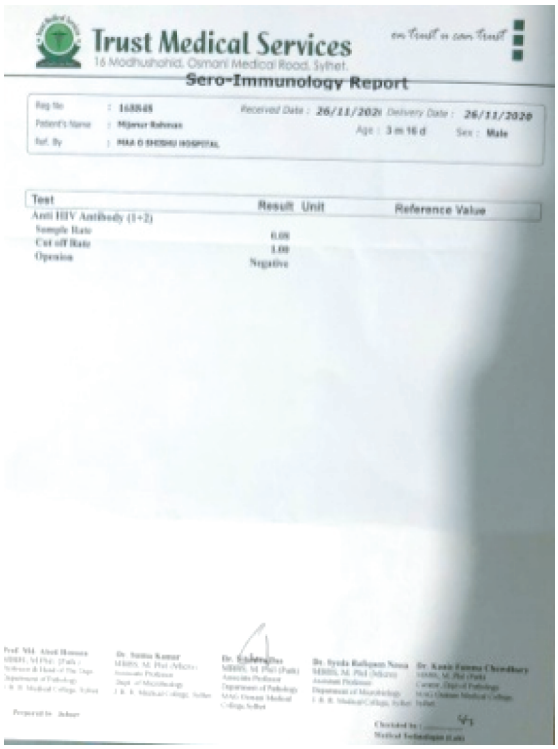

Figure-5: *HIV screening report*

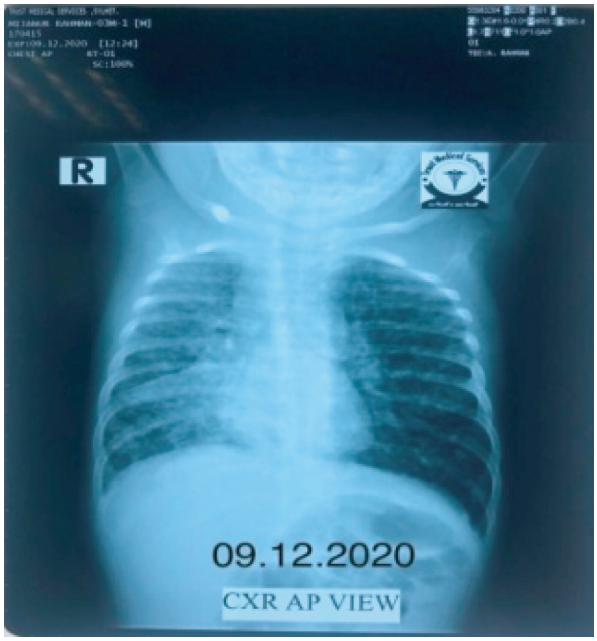

Figure-6: *Follow up CXR after getting Anti-TB drugs- showing improvement.*

DISCUSSION

Most pulmonary tuberculosis cases seen in infants are primary tuberculosis. The primary infection begins with the deposition of infected droplets in the lung alveoli, followed by parenchymal inflammation[6]. The initial inflammation produces localized alveolar consolidation, which is the primary focus. This may, although rarely, progress to involve a segment or an entire lobe and usually is not visible on chest radiographs[6,7]. Infection then spreads to the central lymph nodes from the primary focus via draining lymphatic vessels (Appearing as a linear interstitial pattern on chest radiographs) and results in regional lymphadenopathy. Together, the primary focus and the enlarged lymph nodes that drain it are called the Ranke complex[6-8]. In most cases, the mild parenchymal lesions and lymphadenopathy resolve spontaneously. Caseation necrosis of the regional lymph nodes progresses, and the enlarged nodes may compress the regional bronchi and cause bronchial narrowing, obstruction, and emphysema[6,7].

Clinical diagnosis of tuberculosis in an infant is challenging because infants may present with non-specific findings such as reduced playfulness, fatigue, wheezing, non-remitting cough, failure-to-thrive or lymphadenopathy. A prerequisite for the early diagnosis of TB in childhood is a high index of suspicion. So, children with fever of unknown origin, failure to thrive, significant weight loss, severe malnutrition and/or other immunosuppressive conditions, unexplained lymphadenopathy should be evaluated for TB. Besides this, any child with pneumonia, pleural effusion or a cavitary or mass lesion in the lung that does not improve with standard antibacterial therapy should also be evaluated for tuberculosis[1].

The case we reported here was presented with pneumonia like symptoms and did not improve with standard antibacterial therapy. Elie Choueiry et al.[9] also reported a case of a 5-months old female infant who presented first with a non-productive cough, treated as pneumonia without clinical improvement and diagnosed later as primary TB. Rob van Hest et al.[10] reported an 8-months old baby with cavitating pulmonary TB as well as cerebral tuberculoma, which was recognized after a diagnostic delay of >3 month. This baby presented with the features of a recurrent respiratory tract infection and initially responded well to conventional antibiotic therapy.

TST has been the most utilized exam to evaluate patients suspected of having TB. The CXR pattern can show hilar adenopathy, hyperinsulflation, atelectasis, bronchiectasis, alveolar consolidation, pleural fluid with or without empyema and rarely, cavitation. The HRCT chest shows more details than the CXR. In children, the best way to isolate Mycobacterium tuberculosis (Mtb) is from gastric aspirate culture, although its positivity is only around 30%. Bronchoscopy followed by isolation of Mtb in bronchial secretion obtained from patients suspected to have TB is less sensitive than gastric contents. However, bronchoscopy is an important method for diagnosing endobronchial TB and/or opportunistic infections, in patients with immunodeficiency[11]. Gene-Xpert, a newer WHO-approved technique, can identify Mtb DNA in gastric aspirate, sputum, or pleural fluid in 2 hours[1].

The CXR of our patient showed patchy opacities involving the major portion of the right lung. HRCT chest showed a right-sided cavitary lesion, collapse, consolidation and minimal pleural effusion and gastric lavage for Gene X-pert was positive for Mtb. TST was not done. In the case reported by Elie Choueiry et al.[9] Mantoux's skin test (5TU PPD) was positive and chest radiography revealed parahilar and left lower lobe lung condensation. HRCT chest revealed a large left hilar lymphadenopathy with central necrosis and multiple mediastinal lymph nodes in the paratracheobronchial region. Gastric fluid aspirates showed identification of Mycobacterium tuberculosis through Ziehl-Neelsen acid-fast stain and culture on Lowenstein-Jensen media. The case reported by Rob van Hest et al.[10] in which a tuberculin skin test was not performed. The CXR showed diffuse fine patchy and streaky opacities in the right lung. In the left lung, multiple cavities were present. Bronchoscopy was performed and the obtained bronchial alveolar lavage (BAL) which was positive for Mycobacterium tuberculosis.

CONCLUSION

The morbidity and mortality of TB is at its highest in infancy. The diagnosis of tuberculosis in infancy is also very difficult due to its atypical presentation. Early suspicion and diagnosis of TB is very important as early treatment can prevent complications and reduce mortality.

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