



Case report

Pulmonary tuberculosis presenting as lung abscess in a 10-month-Old infant

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ABSTRACT

Tuberculosis in infants although less common compared to older children and adults, is associated with a high risk for millitary tuberculosis, tuberculosis meningitis and overall higher mortality. Lung abscess commonly presents following severe community acquired bacterial infections and is extremely rare in infants with tuberculosis. This report presents the case of a 10-month-old infant who had an unusual presentation of pulmonary tuberculosis with no cough, poor growth or documented temperature >38 C despite extensive right lung involvement with lung abscess formation and pleural effusions. Inflammatory markers were minimally deranged. The diagnosis of pulmonary tuberculosis was confirmed based on positive tuberculosis polymerase chain reaction test. The child made a successful clinical and radiological recovery upon completion of anti-tuberculosis drug regimen for six months. This report brings to light that it is crucial for clinicians to have a high index of suspicion of tuberculosis irrespective of age of the patient, presenting symptoms and low prevalence since delayed diagnosis of tuberculosis in infants is associated with poor outcomes.

1. Introduction

Tuberculosis is one of the leading causes of mortality from infectious diseases worldwide [1]. The incidence of tuberculosis is higher in developing countries than developed countries [2]. Often tuberculosis in children is underreported due to diagnostic challenges, under-recognition by clinicians and under-reporting by national surveillance programs [3]. These factors can further be confounded by non-specific clinical features, close resemblance to pneumonia and lack of sensitivity of tuberculosis cultures and rapid diagnostic tests in children [4]. Approximately, one million children under 15 years are estimated to be affected by tuberculosis every year with over 200,000 deaths [5]. However, most deaths are unrecognized and generalized as either pneumonia or meningitis [6]. Whilst tuberculosis is rare in young children, the disease carries high mortality [7].

Lung abscess is an uncommon presentation in children and commonly reported aetiologies include Staphylococcus, Streptococcus, and Klebsiella species [8]. Most commonly lung abscess occurs in children with underlying structural lung, and skeletal, or immunological abnormalities. Infants with tuberculosis usually present with pulmonary tuberculosis consisting of either mediastinal lymphadenopathy or

pulmonary parenchymal lesions. However, very rarely, tuberculosis can present with lung abscess. The first report of lung abscess as the presenting feature of tuberculosis in an infant was reported in 2014 [9]. The authors have reported, to the best of their knowledge, the second report in English medical literature, of an infant in whom the diagnosis of tuberculosis was confirmed after presenting with pyrexia of unknown origin and lung abscess.

1.1. Case history

A-10month-old previously healthy well grown child presented with mild fever and cyanosis for one month duration. Fever had been mild and intermittent (37.7C, maximum) and was not associated with chills and rigors, or any respiratory symptoms. Over the course, the child had received one course of oral antibiotics as for a bacterial upper respiratory tract infection by the General Practitioner. However, given the lack of clinical response, she had been treated with oral Clarithromycin following which she improved with resumption of normal activities. Subsequently, she had mild cyanosis while crying, in addition to, fever after a fever-free period of two weeks on presentation to the hospital.

The child was evaluated with blood and radiological investigations

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and chest X-ray showed a lung abscess in right middle lobe (see Fig. 1). She had no contact history of tuberculosis although her grandmother has had recurrent respiratory tract infections for 3 months duration and had been investigated thoroughly including that for tuberculosis. The grandmother had died two months back following bronchopneumonia.

Physical examination and observations revealed a well, adequately grown child with mild tachypnea (40/minute), normal temperature (37.5C) with tachycardia (120/minute), and normal oxygen saturations in air. BCG scar was absent. Respiratory system examination revealed significant reduction in air entry on the right side and impaired percussion note.

Investigations revealed that normal white blood cells ($8.5 \times 10^3/\text{cumm}$), mild anaemia (haemoglobin - 10.2g/dL), and thrombocytosis (platelets- $625 \times 10^3/\text{cumm}$). C-reacting protein was less than 6 mg/dL and ESR (erythrocyte sedimentation rate) was only mildly elevated -42mm/hour. Arterial blood gas was normal. CXR showed opacifications on whole right side with a cystic fluid filled area compatible with lung abscess formation in the upper zone and pleural effusion. Blood cultures showed no growth. Mycoplasma serology was negative. 2 D-Echocardiogram was normal.

She was initially managed as for bacterial right lower lobe pneumonia complicated with lung and pleural effusion with broad spectrum intravenous antibiotics (Cefotaxime). Both lung abscess and pleural effusions were drained and sent for microbiological diagnosis. However, since there was no clinical response after 72 hours of intravenous Cefotaxime, antibiotics were changed to intravenous ceftriaxone and intravenous clarithromycin. Pus cultures showed no growth while waiting for pus cultures sent for tuberculosis culture and TB PCR. She responded partially to intravenous Clarithromycin and it was initially planned to discharge her with oral antibiotics. However, tuberculosis PCR (polymerase chain reaction) was positive confirming the diagnosis of tuberculosis lung abscess. Child was referred to the pulmonology specialist and she was commenced on standard anti-tuberculosis regimen which was continued for 6 months. Family screening showed no individuals positive for tuberculosis.

2. Discussion

Tuberculosis in children is less common than adults and children acquire disease by transmission through adults [10]. Children less than 15 years account for 15% of global tuberculosis cases and the majority of these children reside in developing countries [11]. Although



Figure-1. Chest X-ray shows lung abscess in right middle lobe, right sided pleural effusion and right middle and lower lobe pneumonia.

tuberculosis is rare in infants, they are at high risk for tuberculosis meningitis and milliary tuberculosis which are associated with high mortality. Further, the presentation of tuberculosis in infants is often non-specific and inflammatory markers including ESR are not remarkably elevated [11]. The reported child did not have documented temperature >38 C at any time, growth was normal and ESR was only 42 mm/1st hour. There was no history of cough as a symptom despite having extensive right sided pneumonia, lung abscess and right-sided pleural effusion. This presentation given the extensive lung involvement was unusual compared to previously reported series of infants with tuberculosis [11]. It was likely that she responded partially to Clarithromycin which is a second line anti-tuberculosis drug during the initial stage of disease but only transiently.

Diagnosis of tuberculosis in children is often difficult and clinicians often suspect possibility of tuberculosis based on positive contact history. Sputum smears become positive only in 10% and cultures become positive in only 30–40% of children [12,13]. Nucleic acid amplification tests and adenosine deaminase testing may allow rapid diagnosis of tuberculosis in children [14]. Although tuberculosis PCR was positive in this child, pus cultures for tuberculosis yielded no growth. Presence of lung abscess favors more for a common bacterial infection such as that caused by Staphylococcus, Klebsiella and Streptococcus. Absent contact history and presence of lung abscess at presentation were hindrance to early diagnosis of tuberculosis in this child.

Although CT (Computed Tomography) is increasingly used to further delineate pulmonary tuberculosis, chest X-ray was sufficient in this child to accurately diagnose the extent of lung involvement and offer treatment including drainage. Radiological resolution was evident in follow up chest X-ray after completion of anti-tuberculosis treatment regimen. However, some abnormalities such as round pneumonia, mediastinal lymph-nodes, sub-pleural nodules, bronchiectasis, atelectasis, micro-nodular infiltration, and concomitant collapse and consolidation are better visualized with additional information in chest CT.

WHO recommends active screening of household contacts of the index child to rule out tuberculosis [15]. However, all household contacts of this child were tested negative. It could be possible that her grandmother had tuberculosis and potentially transmitted tuberculosis infection to the grand-daughter. BCG vaccine is widely used in countries where tuberculosis is endemic and helps preventing milliary tuberculosis and tuberculosis meningitis in infants [16].

Lung abscess is extremely rare as a presenting feature of tuberculosis in infants. In a series of 38 cases of tuberculosis in infants less than 3 months from South Africa in which tuberculosis was highly endemic [17], 87% had cough as a presenting symptom and key radiological findings were milliary tuberculosis, hilar and paratracheal adenopathy. None of children had lung abscess formation. Sri Lanka is considered as a country with low prevalence of tuberculosis [18]. However, it is paramount that clinicians are well aware of possibility of tuberculosis irrespective of age of the patient and presenting symptoms since delayed diagnosis of tuberculosis in infants in general is associated with poor outcomes. The first reported infant with tuberculosis complicating lung abscess [9] also had a similar course of events and diagnosis was made only after initial treatment given as for bacterial pneumonia and revision of diagnosis in retrospect based on acid-fast-bacilli positive gastric aspirates. This child tolerated and responded well to standard course of anti-tuberculosis treatment regimen without side effects or drug resistance. Prognosis was excellent in our child as growth and development were age appropriate. Early diagnosis likely brought the outcome better.

3. Conclusion

This case report, to the best of knowledge of authors, has presented the second report of an infant in whom lung abscess was the presenting feature of tuberculosis. The child had an unusual presentation with no cough or poor growth although radiological evidence of extensive right lung involvement was present with lung abscess and pleural effusion. It

is paramount that clinicians have a high index of suspicion of tuberculosis irrespective of age of the patient, presenting symptoms and low prevalence since delayed diagnosis of tuberculosis in infants is associated with poor outcomes.

Consent for publication

Written consent was obtained from legal guardian of the child to publish the image and clinical information.

Availability of data

The data that support the findings of this case report are available from Medical Records Department, Batticaloa Teaching Hospital, but restrictions apply to the availability of these data, which were used under license for the current report and so are not publicly available. Data are, however, available from the authors upon reasonable request and with permission of Medical Records Department, Batticaloa Teaching Hospital, Sri Lanka.

Author contributions

VT led clinical management and wrote manuscript. KD performed literature survey, wrote and edited manuscript. All authors read and approved final version of the manuscript.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.rmcr.2020.101229>.

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