

Case Report

Tubercular and bacterial coinfection: A case series

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ABSTRACT

Tuberculosis (TB) is a major public health issue in India. Although dual infection with tuberculosis and bacteria/fungi has been reported in immunocompromised patients, their co-occurrence in individuals with preserved immunity may complicate the clinical presentation, leading to inadequate treatment and unsatisfactory outcomes. In patients with pulmonary tuberculosis, the occurrence of tubercular lesions in atypical locations may further confound the clinical picture if only one of the pathogens is isolated, initially leading to a suboptimal therapeutic response. A strong index of suspicion and additional diagnostic testing may be required for diagnosis and treatment of the second infection. We report three unusual cases of concurrent tubercular and bacterial infection, of which two are pulmonary and one is extrapulmonary.

KEYWORDS: Bacteria, concurrent infection, *Enterococcus*, *Enterococcus pneumoniae*, *Klebsiella*, *Staphylococcus*, tuberculosis

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INTRODUCTION

Coinfection with tuberculosis (TB) and bacteria has not been widely reported. Although superadded bacterial infection can occur in TB patients, the simultaneous occurrence of both infections leads to delayed diagnosis and inadequate treatment. Tubercular-bacterial coinfection needs to be considered, especially if TB occurs in atypical pulmonary or extrapulmonary locations.

Tuberculosis of the lower lung fields poses a diagnostic dilemma even in endemic areas.^[1] Diagnosis of extrapulmonary TB, which constitutes 15-20% of the tuberculosis in immunocompetent patients is difficult due to, atypical presentation, necessity for tissue diagnosis, and poor diagnostic yield.^[2] The presentation may be further confounded by the initial isolation of one pathogen. Thus, a diagnostic workup may be delayed until a suboptimal response or clinical worsening is noted.

In the present series, we report three cases of concurrent TB and bacterial infection in pulmonary and extrapulmonary locations.

CASE REPORTS

Case 1

A 30-year-old female presented with a history of multiple episodes of productive cough, fever, and anorexia without significant weight loss, since one year. Her referral records revealed normal laboratory tests and negative sputum for acid fast bacillus (AFB) and bacteria. She had received several courses of broad-spectrum oral antibiotics on an outpatient basis for suspected pneumonia, with temporary symptomatic relief. Besides, there was no resolution of the left lower zone opacity on serial chest radiography [Figure 1a].

On respiratory examination, there were decreased breath sounds in the left infrascapular area. Complete blood counts showed an elevated total leukocyte count (14,100/cu.mm), with a normal erythrocyte sedimentation rate (ESR). The Mantoux test was positive. Human immunodeficiency virus (HIV) serology and sputum testing were negative. Contrast Enhanced computed tomography (CECT) of the thorax showed left lingular and lower lobe consolidation with pleural effusion [Figure 1b].

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On bronchoscopy, mucoid secretions were noted in the lingular lobe. Bronchoalveolar lavage fluid grew *Enterococcus* sensitive only to Linezolid, which was negative for AFB. Transbronchial lung biopsy showed chronic non-specific inflammation. Oral Linezolid was started. On a three week follow-up, the patient reported symptomatic improvement, but radiological resolution was minimal [Figure 1c].

A repeat computed tomography (CT) scan confirmed persistence of consolidation and increase in pleural effusion [Figure 1d]. CT-guided lung biopsy and diagnostic thoracentesis were performed. The histopathology revealed chronic granulomatous inflammation with Langhans giant cells. Pleural fluid was a lymphocytic exudate. The patient was started on anti-tubercular therapy (ATT). On follow-up, there was significant radiological resolution on completion of one month of ATT [Figure 1e].

Case 2

A 55-year-old male alcohol abuser, presented with fever, productive cough, and exertional breathlessness since two weeks. He had not been on any treatment for the above-mentioned illness before presentation to our hospital. On clinical assessment, the patient had features of severe community acquired pneumonia (CAP). Hence, he was admitted to the high dependency unit (HDU) and routine blood and sputum tests were sent. A chest radiogram revealed right lower zone consolidation with effusion [Figure 2a]. Laboratory investigations were normal, except for a raised ESR. The patient was started on intravenous Cefoperazone–Sulbactam. As fever spikes continued despite 72 hours of antibiotic therapy,

pleurocentesis and CT thorax were performed. Reports of the initial sputum sample sent at admission revealed that it was positive for AFB and also grew *Klebsiella* sensitive only to Meropenem on bacterial culture. Pleural fluid analysis revealed a lymphocyte predominant exudate with raised ADA levels. The CECT thorax showed right lower lobe consolidation and pleural effusion [Figure 2b]. A diagnosis of pulmonary TB with concurrent *Klebsiella* pneumonia was made. ATT was started and antibiotics were escalated, following which the patient improved clinically and radiologically.

Case 3

A 30-year-old, healthy, non-puerperal female presented to the Surgical Outpatient Department with painful swelling and discharge from the left breast since one month. On examination, there was a 4 × 4 cm, firm, nontender swelling, with seropurulent discharge from the left breast, with associated nipple retraction.

A diagnosis of breast abscess was made and oral broad-spectrum antibiotics (Amoxicillin–Clavulanic Acid) were started. In view of the clinical non-resolution, despite two weeks of antibiotic therapy, pus aspiration and biopsy were performed. The pus culture grew *Staphylococcus aureus* and histopathology revealed chronic granulomatous inflammation with Langhans giant cells. The AFB stain was negative. Anti-staphylococcal antibiotics and ATT were started. The former was continued for three weeks. On the fourth week follow-up, the patient improved symptomatically, but the lump and discharge persisted. Complete regression of the lump and cessation of discharge were noted only after completion of intensive phase of ATT.

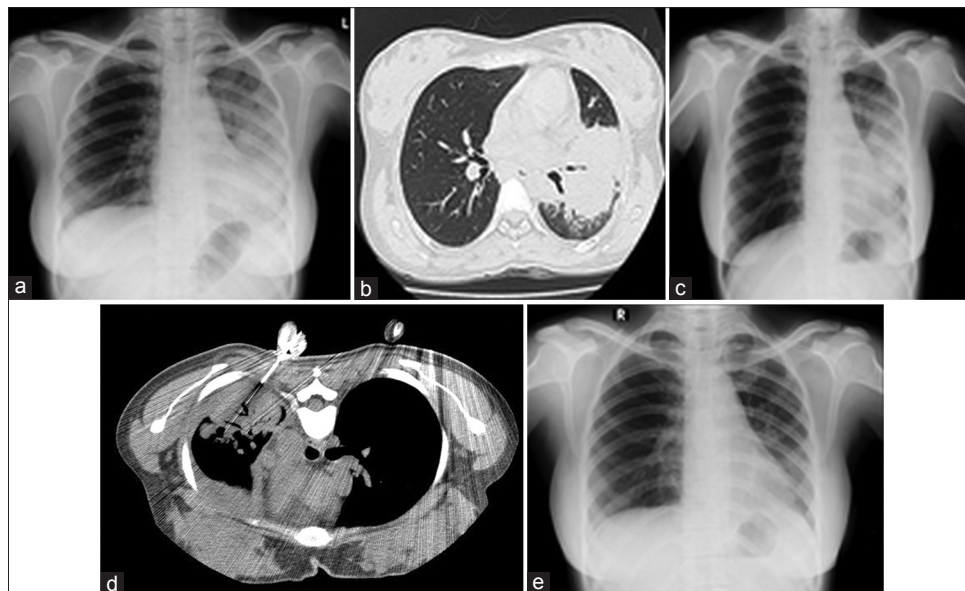


Figure 1: (a) Chest radiograph (PA view) showing left lower zone haziness suggestive of consolidation with effusion; (b) Contrast-enhanced CT thorax image showing consolidation in the left lingular and lower lobe and mild pleural effusion; (c) Chest x-ray obtained three weeks after the antibiotic course shows minimal resolution of consolidation in the left lung; (d) A repeat CT thorax performed three weeks after antibiotic therapy shows persisting consolidation in the lingular lobe left lung with increase in pleural effusion. Note the biopsy needle *in situ*; (e) Chest x-ray obtained one month after addition of antitubercular therapy shows significant radiological resolution of the consolidation

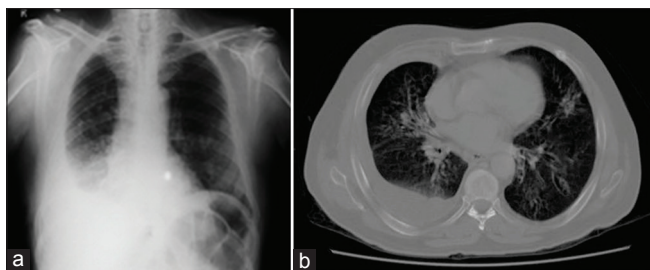


Figure 2: (a) Chest radiogram showing right lower zone consolidation with pleural effusion; (b) CT thorax (lung window) showing tree-in-bud appearance with right basal consolidation and pleural effusion

DISCUSSION

Tubercular and bacterial coinfection is uncommon in patients with preserved immunity, but has been described in immunodeficient hosts such as those with HIV–AIDS.^[3] There are a few reports about the co-occurrence of TB with organisms like *Streptococcus pneumoniae*,^[3] *Salmonella typhi*^[4] and *Streptococcus milleri*.^[5] However, tubercular co-infection in otherwise immunocompetent patients, with organisms that are usually implicated in nosocomial infections has not been reported in literature.

The first patient in our series was an unusual case of community-acquired enterococcal infection with TB. *Enterococci* are an important cause of serious nosocomial infections,^[6] but are rare causes of community-acquired pleuropulmonary infection in immunocompetent patients, with a reported incidence of 4%.^[7] Pneumonia has been reported in severely debilitated patients, those on broad-spectrum antibiotics^[8,9] and in HIV-positive patients.^[10] Coinfection with *Enterococcus* in lower lung field tuberculosis has not been reported previously. Our patient showed partial clinical, but no radiological response to treatment for *Enterococcus*. Thus, diagnostic testing for second lung pathology was the cornerstone to the diagnosis of TB in this case.

The second case illustrates a coexisting bacterial infection in a sputum-positive tuberculosis case, where the clinical presentation was one of severe CAP. Bacterial pneumonia is the most widely recognized infection in patients with ethanol abuse.^[11] However, dual infections are not very common. *Klebsiella* infection has been diagnosed in TB suspects,^[12] but coexistent diagnosis of both infections has not been reported. Whether the occurrence of one predisposes the other, is a matter for further scientific consideration.

The third patient was a case of mastitis secondary to tubercular and staphylococcal infection. Tuberculous mastitis occurs in 3% of the mammary lesions and is diagnosed based on granulomas in histopathology or culture with/without AFB positivity.^[13,14] Hartstein reported *S. aureus* and TB infection in a HIV-positive patients.^[15] Although non-puerperal breast infections can present

as chronic mastitis and sinus tracts,^[16] a histopathology suggestive of TB may necessitate the addition of ATT to the antibiotic regimen.

To conclude, the co-presence of tuberculosis and bacterial infections in immunocompetent patients is not a commonly reported entity. Detection of one infection usually masks the diagnosis of the other. A strong index of suspicion, timely workup, and dual therapy are indicated in such cases.

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