Severe Pulmonary Tuberculosis in Young HIV Negative Adults at Tanga Regional Referral Hospital, Tanzania

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ABSTRACT

Tuberculosis (TB) remains a major public health challenge globally and particularly in high-burden countries like Tanzania. While TB is frequently associated with HIV co-infection, there is increasing number of reports from Tanzania and other sub-Saharan African countries indicating that young, HIV-negative adults can present with aggressive and rapidly progressive forms of pulmonary TB. This case series highlights two young, HIV negative patients presenting with severe pulmonary TB at Tanga Regional Referral Hospital. Both cases were characterized by critical hypoxemia, extensive lung involvement, and rapid clinical deterioration despite standard anti-TB therapy, culminating in mortality. These cases underscore the importance of recognizing severe TB manifestations in diverse populations and the need for improved management strategies.

Key words: Severe pulmonary tuberculosis, Young HIV negative adults, Rapid clinical deterioration

INTRODUCTION

Tuberculosis (TB) remains a major public health concern worldwide, despite advancements in diagnostic tools and treatments. It is a leading cause of infectious respiratory disease and is associated with significant morbidity and mortality, particularly in low- and middle-income countries (1). TB commonly presents with constitutional symptoms such as a persistent cough, fever, night sweats, and weight loss. Diagnosis is often complicated by overlapping presentations with other respiratory conditions and variable patient responses to treatment (2).

Although TB is frequently associated with HIV co-infection, a growing body of evidence suggests that severe TB manifestations are not limited to immunocompromised patients. In fact, an increasing number of reports from Tanzania and other sub-Saharan African countries indicate that young, HIV-negative adults (typically between 15 and 35 years of age) can present with aggressive and rapidly progressive forms of pulmonary TB (3, 4).

Notably, data from the Tanzanian National TB Control Program have revealed that a significant minority (estimated between 10% and 20%) of severe TB cases in young adults occur in HIV-negative individuals. These cases often exhibit extensive pulmonary involvement, including cavitary lesions and bilateral infiltrates, which are associated with high morbidity and mortality rates despite early initiation of anti-tubercular therapy (5).

These cases often demonstrate severe presentations and poorer outcomes, challenging the conventional understanding of TB as a disease primarily linked to immunosuppression (3). Here, we describe two cases of severe TB in young HIV negative adults treated at Tanga Regional Referral Hospital, Tanzania, with both patients succumbing to respiratory failure despite prompt anti-TB therapy.

CASES PRESENTATION

The first case was a 17-year-old female presented with a three-week history of productive cough, progressive shortness of breath, low-grade fever, and night sweats. Despite treatment for bacterial pneumonia at a local

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health facility, her symptoms persisted. She had no history of TB exposure, mining, or any other underlying comorbid. On day of admission, the patient was dyspneic with a respiratory rate of 29 breaths/min and an oxygen saturation of 71% on room air, improving to 93% in 10L of oxygen with a non-rebreather mask. Physical examination; was a young lady, wasted and chest auscultations revealed scattered bilateral crepitations.

The second case was a 27-year-old male presented with a one-month history of cough, progressive shortness of breath, low-grade fever, and significant weight loss. Previously treated for bacterial pneumonia without improvement, he had no known TB exposure, mining work, cigarette smoking or any other underlying comorbid. On day of admission, he was dyspneic with a respiratory rate of 26 breaths/min and oxygen saturation ranging from 78-80% on room air, improving to 94% on 5 L/min oxygen via nasal prongs. Physical examination; was a young man wasted and chest auscultations revealed coarse crepitations more prominent on the left lung.

Laboratory and radiological findings

For the first patient, laboratory findings included microcytic hypochromic anemia (Hb 9.1 g/dL), a negative HIV test, normal renal and electrolyte levels, and a mildly elevated C-reactive protein (16 mg/L). GeneXpert testing detected Mycobacterium tuberculosis in low amounts without Rifampicin resistance. Sputum culture revealed Moellerella wisconsensis sensitive to ciprofloxacin and co-trimoxazole. Chest X-rays (Figure 1) showed thick-walled cavitary lesions in the upper and middle lung zones bilaterally, with multiple airspace opacities suggesting advanced pulmonary TB.

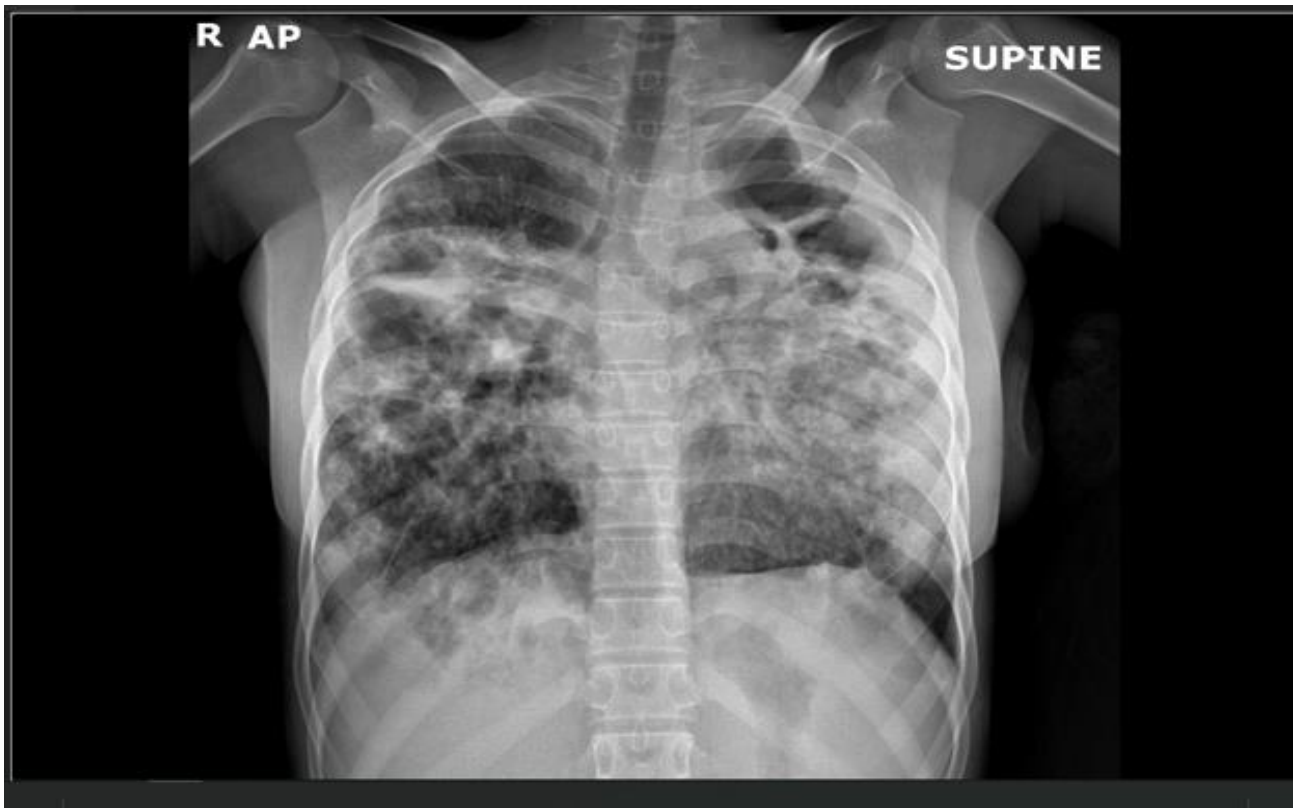

Figure 1: Chest X-rays of a 17-year-old girl with pulmonary tuberculosis showing thick walled cavitary lesions, two on the right upper and middle lung zones and one on the left upper lung zone associated with bilateral multiple air space opacities more on the upper, middle and lower lung zones sparing the apical zones bilaterally suggestive of pulmonary tuberculosis

In the second patient; laboratory findings showed normocytic normochromic anemia (Hb 11.9 g/dL), negative HIV test, normal renal function, and electrolytes. GeneXpert detected Mycobacterium tuberculosis in low amounts without Rifampicin resistance, while sputum culture there was no bacterial growth. Chest X-rays

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(Figure 2) revealed reduced right lung volume, bilateral nodular and airspace opacities, and blunting of costophrenic angles indicative of advanced pulmonary TB.

Figure 2: Chest X-rays of a 27-year-old man with pulmonary tuberculosis showing reduced volume of the right lung associated with bilateral multiple widely distributed nodular and airspace opacities of variable sizes. Bilateral blunting of costophrenic angles, hemidiaphragms and right cardiophrenic angle highly suggestive of pulmonary tuberculosis

Patients' treatment and outcome

Both patients were treated with first-line anti-TB therapy (Rifampicin, Isoniazid, Pyrazinamide, and Ethambutol) and other supportive treatment including oxygen therapy. In addition, the first case was given intravenous ciprofloxacin. Despite close monitoring both patients had rapid clinical deterioration and succumbed to respiratory failure and died on day five and seven respectively of admission.

DISCUSSION

The two cases presented herein highlight a concerning epidemiological shift in TB manifestations among young, immunocompetent adults in Tanzania. While TB is traditionally associated with immunosuppression, recent data suggest that young adults without overt immune deficits can develop fulminant, rapidly progressive pulmonary TB (1, 3). Advanced radiological findings in these patients point to extensive parenchymal destruction, which is associated with high mortality despite early therapeutic intervention (5, 6).

Multiple factors may contribute to this phenomenon:

- Diagnostic Delays: Both patients experienced a significant delay in reaching a definitive diagnosis, often being initially managed for bacterial pneumonia. Such delays have been linked to worsened outcomes in TB cases (4, 7).
- Severe Disease Burden: Extensive pulmonary involvement, as evidenced by cavitary lesions and widespread opacities on chest imaging, correlates with a higher risk of respiratory failure (8).
- Host Factors: Although immunocompetent, genetic predisposition, nutritional status, or unrecognized co-infections (as seen with Moellerella wisconsensis in Case 1) might influence the severity of TB (9, 10).
- Therapeutic Limitations: The rapid progression observed in these cases suggests that standard anti-TB regimens, when administered late in the disease course, may be insufficient to reverse severe

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pulmonary damage. This calls for a review of current management protocols and the potential incorporation of adjunctive therapies (11).

These findings echo recent reports from sub-Saharan Africa, underscoring the need for enhanced diagnostic facilities (e.g., rapid molecular assays) and improved supportive care measures. Moreover, public health interventions must focus on raising community awareness regarding atypical TB presentations in young individuals and ensuring timely referral to specialized care centers (12, 13).

CONCLUSION

Severe pulmonary TB can occur in young, HIV negative individuals and is associated with rapid clinical deterioration and high mortality. These cases from Tanga Regional Referral Hospital underscore the critical need for early diagnosis, comprehensive supportive care, and possibly revised treatment protocols to manage aggressive TB presentations in this population. Addressing diagnostic delays and exploring the interplay of host and microbial factors will be essential in mitigating the burden of severe TB in Tanzania.

Ethical considerations and consent to publish

Ethical clearance to publish this case report was obtained from Tanga Regional Referral hospital.

Competing interests

The author declares no competing interests.

Authors' contributions

Lucheri E Kweka contributed in the management of the patients and writing the manuscript.

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