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RESEARCH ARTICLE

A RARE CAUSE OF ACUTE RESPIRATORY FAILURE: CYSTIC PULMONARY TUBERCULOSIS

H. Asri, A. Zegmout, A. Rafik, H. Souhi, I. Rhorfi and H. Elouazzani

Pulmonology and Phtisiology Department, Mohamed 5 Military Hospital Teaching.

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Abstract

Tuberculosis continues to be a major cause of death. It is a preventable and curable disease. The most common bacteria likely to cause a cystic pneumonia are *Staphylococcus aureus*, *Streptococcus pneumoniae* and *Escherichia coli*. The cystic pulmonary tuberculosis is exceptional and should be defined as different from other cystic lung disease. We present a case report of immunocompetent patient with acute respiratory failure. Pulmonary tuberculosis with unusual cystic change in an immunocompromised host.

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Introduction:-

Tuberculosis is characterized by a clinical and radiological polymorphism the diagnosis is easy in the typical form but presents a real problem of differential diagnosis in countries endemic for tuberculosis.

Acute respiratory distress syndrome (ARDS) is known to be one of the complications of miliary tuberculosis [1]. Cystic and bullous lung tissue changes caused by tuberculosis are an exceedingly rare condition with only a limited number of cases reported. This special form of TB infection features rapidly developing multiple cystic-like lesions in both Lungs, mostly in the upper lobes, along with severe clinical symptoms such as respiratory distress and/or recurrent pneumothorax, leading often to a fatal outcome [2].

Case Report

A 59-year-old male patient presented in emergency room with the complaints of fever for 1 month duration and shortness of breath for 10 days. On examination, patient's pulse rate was 130 beats/min, oxygen saturation was 77%, blood pressure was 90/60 mmHg, respiratory rate was 30/min. On auscultation chest revealed left crepitations. Chest X-ray showed left diffuse reticular shadows (figure 1). A CT scan of chest (Figure 2) showed a multiple thin-walled cysts in the left lung; diffuse ground glass opacities and centrilobular nodules in left lung.

The WBC count was 5800/mm³, CRP: 83 mg/L, Procalcitonin: 0.12. A serological test for HIV was negative. The patient's sputum was positive for acid-fast bacilli, and a culture was positive for *Mycobacterium tuberculosis*.

A diagnosis of respiratory failure from interstitial lung disease associated with tuberculosis was made and treatment with corticosteroids and the standard TB drugs rifampicin (R), isoniazid (H), ethambutol (E) and pyrazinamide (Z) (known as the 2RHZE/4RHE regimen) was initiated, allowing in rapid improvement of the respiratory failure.

Corresponding Author:- H. Asri

Address:- Pulmonology Department, Mohamed 5 Military Hospital Teaching.

Discussion:

Tuberculosis continues to be a major public health problem causing ill-health to approximately 10 million people each year. Tuberculosis (TB) is a preventable and usually curable disease. Yet in 2022, TB was the world's second leading cause of death from a single infectious agent, after coronavirus disease (COVID-19), and caused almost twice as many deaths as HIV/AIDS [3].

The most common CT findings of reactivation pulmonary TB are centrilobular small nodules, branching linear and nodular opacities present as 'tree-in-bud' sign, patchy or lobular areas of consolidation, and cavitation. The risk factors of atypical forms of tuberculosis are HIV, diabetes, substance misuse, advanced kidney disease, malnutrition and treatment with corticosteroids or immunosuppressant.

A lung cystic defined as a well-circumscribed air-filled structure that is localized within the lung parenchyma, is >1 cm in diameter and has a definable epithelial or fibrous wall that is usually <1 mm thick, but that may be up to 2 or 3 mm thick.[4]

Cysts arising as a complication of pulmonary tuberculosis have been very rarely reported and are amongst the rarest presentation of this common disease [5].

A variety of lung diseases can cause or mimic thin-walled air-containing cysts in the lung. Cysts may be classified as congenital and acquired. The more common congenital causes for cysts in lung diseases include central and peripheral bronchogenic cysts, intralobar pulmonary sequestrations, congenital cystic bronchiectasis, cystic adenomatoid malformation of lung and tracheobronchial papillomatosis [6].

Several mechanisms have been suggested for the pathogenesis of cystic lung lesions due to tuberculosis: a) a check-valve mechanism due to the granulomatous involvement of bronchioles and the excavation of caseous necrotic material by bronchial drainage) the communication of tuberculous lesions containing caseous necrosis with the bronchi, resulting in the excavation of necrotic material and cystic changes; and c) the cystic lesions representation of areas of dilated bronchioles. Immunohistochemical studies and electron microscopic examinations have revealed that the proteinases secreted from the inflammatory cells of peribronchiolar granulomas are partly responsible for the degradation of elastic fibers along the bronchioles, alveolar ducts, and alveolar walls.[7]

Cause of hypoxemia in non-miliary tuberculosis is a result of direct injury to alveolar epithelial cells from tubercular antigens through liquefied, caseous lesions. These effects may further be accentuated by bronchogenic spread. A small amount of bacillary antigen is enough to evoke an exudative response in the host and is an important determinant of direct injury [1].

Conclusion:-

Tuberculosis cystic with respiratory failure has a good prognosis, atypical forms of tuberculosis must be known for rapid diagnosis and the diagnosis is based on clinic, radiology and microbiology early diagnosis and treatment are imperative to prevent not only morbidity and mortality but also disease transmission.

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