

Bagassosis- An Infrequent Type of Hypersensitivity Pneumonitis: A Case Report

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Abstract

Hypersensitivity pneumonitis (HP) is an umbrella term for a spectrum of disorders caused by the inhalation of organic dust or low molecular weight chemicals. Bagassosis, a rare form of HP, is an allergic reaction caused by inhalation of bagasse dust, which is used in manufacturing several products. Very few cases of bagassosis have been reported in India, owing to the growing industrialization adapting organized sectors for preventing occupational health disorders. Nevertheless, a small population is being exposed to bagasse dust, shadowed by inadequate protective equipment, leading to the occurrence of this occupational disease. Here, we report a case of bagassosis in a 25-year-old male, brick-kiln worker, who presented with respiratory complaints. He underwent a transbronchial lung biopsy that aided in confirmation of the disease, but developed pneumothorax as a complication, which was managed with an Intercostal drain. He was started on corticosteroids, following which his symptoms improved significantly.

Keywords: Bagassosis, hypersensitive pneumonitis, transbronchial lung biopsy

INTRODUCTION

Hypersensitivity pneumonitis (HP) also known as extrinsic allergic alveolitis encompasses a spectrum of disorders caused by the inhalation of organic dust or low molecular weight chemicals.^[1] One such disorder among the spectrum is Bagassosis, caused by an allergic reaction to bagasse dust which is a major remaining product of the sugarcane industry. This product is used in the manufacture of pulp, and paper industries, as biofuel, or in lacquerware crafts.^[2] The size of the bagasse dust particle ranges from 0.08 to 9 μm , hence harboring the potential to reach respiratory bronchioles and cause sensitization with subsequent lung damage.^[3] Here we report a case of bagassosis in a 25-year-old male, brick-kiln worker, who presented with respiratory complaints. After receiving treatment with a corticosteroid, the patient's symptoms improved significantly.

CASE REPORT

A twenty-five years old male, the brick-kiln worker, reported complaints of shortness of breath followed by cough with

expectoration for 5 months, associated with low-grade intermittent fever without chills, loss of appetite, and 21 kg weight loss of five months duration. The patient also reported a history of 2 episodes of hemoptysis, 4 months prior to his presentation. There was no history suggestive of allergic rhinitis, recurrent respiratory tract infections, or asthma in past. The patient's occupational history revealed that he was a laborer in a brick kiln for two years where bagasse dust was used as fuel and the workers were exposed to iron filings and bagasse dust. The sequence of events in manufacturing the bricks at his workplace is highlighted in Figure 1.

Routine investigations including complete blood count, erythrocyte sedimentation rate (ESR), and urinalysis were normal. The absolute eosinophil count was 100/ μL .

Chest X-ray postero-anterior (PA) was normal [Figure 2]. Sputum for acid-fast bacilli (AFB) was negative, but pulmonary tuberculosis was considered as the first differential

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because of its endemicity in India. However, other differentials like hypersensitivity pneumonitis were also considered.

Hence CT thorax was planned which showed diffuse ground-glassing with a mosaic pattern in both lungs suggestive of Pulmonary alveolar proteinosis/Hypersensitivity pneumonitis/Atypical pneumonia as depicted in Figure 3. COVID-19 infection was ruled out. HIV serology was negative.

A video bronchoscopy was performed which revealed unremarkable findings. BAL fluid was obtained which was not milky white, and became clear within a few minutes of standing, hence ruling out Pulmonary Alveolar Proteinosis. BAL fluid was negative for AFB. BAL fluid PAS staining,



Figure 1: The sequence of events in manufacturing the bricks at his workplace

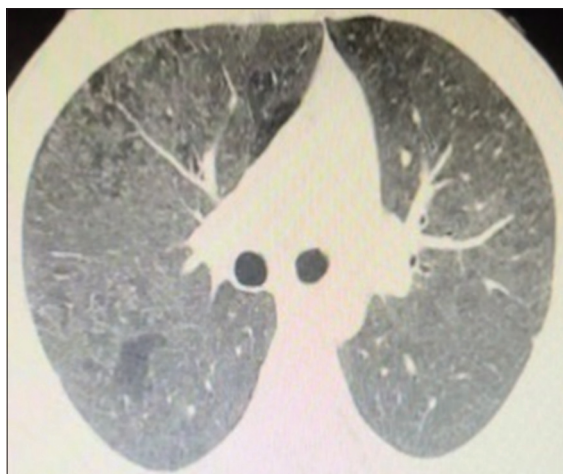


Figure 3: CT thorax showing diffuse ground-glassing with mosaic pattern in both lungs suggestive of Pulmonary alveolar proteinosis/Hypersensitivity pneumonitis/Atypical pneumonia

Alcian blue staining, and Gomori Methenamine Silver stain for fungal elements were negative [Figure 4].

Transbronchial Lung Biopsy (TBLB) was done and the specimen was sent for histopathological examination that revealed diffuse inflammatory cells like lymphocytes, plasma cells, within alveolar spaces, and intervening stroma with foci of anthracosis pigments, suggestive of hypersensitivity pneumonitis [Figure 5]. Following the bronchoscopy, the patient complained of chest pain. Chest X-ray showed Right sided pneumothorax which was managed with an intercostal drainage tube under a water seal.

A pulmonary function test was not performed before bronchoscopy due to the suspicion of Tuberculosis, but later the test was deferred due to the complication of pneumothorax following TBLB.

The patient was subsequently started on corticosteroids, prednisone 0.5 mg/kg/day, following which he showed significant improvement. He was also counseled on changing



Figure 2: Chest X-ray PA view- normal

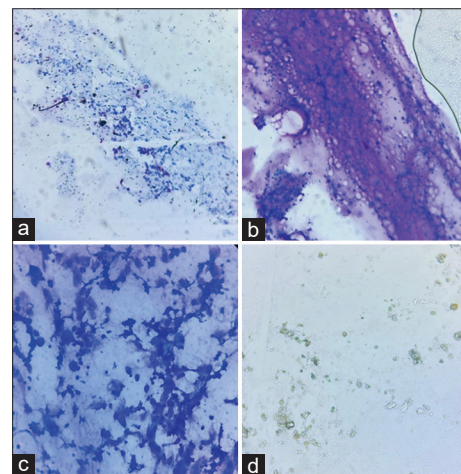


Figure 4: (a) BAL fluid - negative for AFB. (b) BAL fluid for PAS staining- negative. (c) BAL fluid for Alcian blue staining – negative. (d) BAL fluid for Gomori Methenamine Silver stain for fungal elements – negative

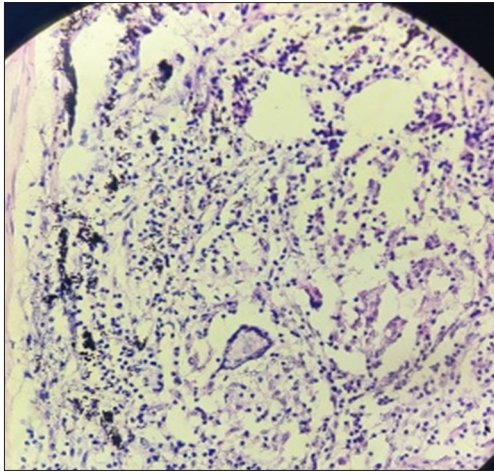


Figure 5: TBLB for histopathological examination showing diffuse inflammatory cells like lymphocytes, plasma cells, within alveolar spaces and intervening stroma with foci of anthracotic pigments, suggestive of hypersensitivity pneumonitis

his current job so as to cease the exposure to the offending agent.

DISCUSSION

Occupational lung diseases have been showing a rising trend in recent times. Bagassosis as an occupation-related HP, caused by repetitive inhalation of bagasse (sugarcane dust), was common before the 1970s but nowadays rare, owing to the development of sugarcane industries into an organized sector.^[4] The first case of bagassosis in India was reported from a paper mill in Kolkata in 1955.^[5] It is found that 42.5% of sugar refinery workers exposed to bagasse developed respiratory complaints.^[6] The immune response in HP is triggered by the exposure to particles sufficiently small in size (diameter < 5 µm) that reach the alveoli. HRCT diagnosis is based on the presence of diffuse ground glassing, with centrilobular nodules. Our patient presented with respiratory complaints with HRCT suggestive of diffuse ground glassing. The aggravation of symptoms on work days provided a clue to the diagnosis of HP. Bronchoscopy-guided transbronchial lung biopsy aided with the confirmation of diagnosis and hence treatment was initiated. Once the diagnosis of HP is established, it is warranted to avoid the offending antigen so as to improve the symptoms and lead a better quality of life.

Albeit the adequate precautions taken by the growing industrialization to prevent occupational health diseases, a large part of the developing countries are still crippled by the lack of appropriate technology and advanced preventive

methods. In a developing country like India, due to the lack of organized sectors, a large population is being exposed to organic and inorganic dust, that which poses difficulty in curbing the health hazards.

CONCLUSION

The amalgamation of a meticulous history regarding occupational and avocational exposure, thorough clinical examination, and systematic diagnostic approach along with a high index of suspicion is necessary for the early diagnosis and treatment of this potentially reversible, otherwise debilitating condition. Despite the endemicity of Tuberculosis in India, the differential diagnosis of other diseases that present with similar clinical features needs to be considered before establishing the diagnosis of TB and initiating the treatment. The invention of bronchoscopy and transbronchial lung biopsy has paved way for the identification of numerous conditions at an earlier stage and Hypersensitivity pneumonitis has also benefitted from it among the many.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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