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A CASE OF HYPERSENSITIVITY PNEUMONITIS IN A YOUNG LADY FROM HOUSE-HOLD EXPOSURE

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Abstract

Hypersensitivity pneumonitis (HP) is an immune-mediated lung disease triggered by repeated exposure to environmental antigens. It can lead to significant lung damage if untreated. This case report describes a 20-year-old Nigerian woman with HP caused by household allergen exposure. The patient presented with an 8-month history of persistent cough and progressively worsening dyspnea. Despite trials for asthma, symptoms persisted. She had a history of caring for poultry at home, which was a potential environmental trigger. Physical examination revealed respiratory distress and bilateral fine crackles. High-resolution computed tomography (HRCT) showed suggestive features, while echocardiography revealed elevated pulmonary pressures. The diagnosis of HP, likely triggered by household allergen (poultry, biomass) exposure, was entertained. Corticosteroids were initiated, and the patient was advised to avoid poultry, resulting in significant improvement. This case highlights the importance of considering HP in young adults with unexplained respiratory symptoms and relevant environmental exposures. Bird fancier's lung, a subtype of HP, is often triggered by bird proteins. HRCT, inflammatory markers, and detailed exposure history are key to diagnosis. Early treatment with corticosteroids and antigen avoidance can significantly improve symptoms and prevent long-term lung damage. HP should be considered in patients with unexplained respiratory symptoms and relevant exposures. Early diagnosis and intervention, including corticosteroids and antigen avoidance, are essential to prevent irreversible lung damage. Further research into advanced therapies for refractory cases is needed.

KEYWORDS:

Introduction

Hypersensitivity pneumonitis (HP) is an immune-mediated inflammatory lung disease triggered by repeated exposure to environmental antigens, such as organic proteins, fungi, mold, and chemicals (Anwar et al., 2022; Spagnolo et al., 2015). The disease can manifest as both acute and chronic forms, with its severity dependent on various factors, including the type of antigen, the intensity and duration of exposure, and genetic susceptibility (Anwar et al., 2022; Moua et al., 2022). Although HP affects individuals of all age groups, cases in young individuals are often linked to home environments or specific hobbies, such as exposure to bird proteins, mold, or household chemicals like paints and plastics (Alberti et al., 2021; Creamer & Barratt, 2020; Mohamed et al., 2020).

The disease is most commonly associated with occupational and domestic exposures, particularly in farming, poultry farming, and other environments where inhalation of bird droppings and feathers occurs (Spagnolo et al., 2015). Bird fancier's lung (BFL), a form of HP triggered by inhaling bird proteins, is one of the most prevalent subtypes (Barnes et al., 2022). The inhalation of such antigens leads to an immune response, resulting in symptoms like cough, dyspnea, chest tightness, weight loss, and fever (Tony et al., 2022; Zhang et al., 2022). The diagnosis of HP is challenging due to its nonspecific clinical presentation and the absence of universally accepted diagnostic criteria (Alberti et al., 2021; Dabiri et al., 2022; Fernández et al., 2021; Morisset et al., 2018; Raghu et al., 2020). Advances in diagnostic methods, such as high-resolution computed tomography (HRCT) and serological tests, have improved diagnosis (Alberti et al., 2021; Fernández Pérez et al., 2021). However, early identification and removal of the causative antigen remain crucial for effective management.

In this report, we present the case of a 20-year-old Nigerian woman who developed hypersensitivity pneumonitis likely due to exposure to household allergen (poultry and biomass). The report highlights the importance of considering HP in the differential diagnosis of unexplained respiratory symptoms, especially in individuals with relevant environmental exposures.

Case Presentation

A 20-year-old single woman from Sokoto, Nigeria, presented with an 8-month history of persistent cough and progressively worsening dyspnea. The cough began insidiously as a dry and occasional symptom, which gradually became persistent and productive, yielding small amounts of mucoid sputum, but without hemoptysis or foul-smelling discharge. The cough did not vary in intensity with body position or time of day, and there were no episodes of wheezing, paroxysms, or changes in cough patterns during physical activity.

Dyspnea developed shortly after the onset of the cough, initially occurring with mild exertion, but progressively worsened, eventually occurring at rest. The patient denied symptoms of orthopnea, paroxysmal nocturnal dyspnea, chest tightness, or weight loss. She also had no fever or night sweats. Tuberculosis was ruled out following

screening, and there was no history of exposure to individuals diagnosed with the disease.

The patient's home environment was significant. She had been involved in fabric sewing for two years and cooked with her mother using firewood. Additionally, the family kept poultry, which she actively cared for. She denied exposure to smoking, chemicals, or other pollutants. Despite seeking care at multiple hospitals, including a trial treatment for asthma, her symptoms persisted.

Upon examination, the patient appeared in respiratory distress with an oxygen saturation of 78% on room air, improving to 96% with supplemental oxygen. Physical examination revealed fine crackles bilaterally in the lungs and a loud second heart sound (P2). Cardiovascular examination was otherwise unremarkable, and there was no peripheral edema or lymphadenopathy. Investigations showed an elevated erythrocyte sedimentation rate (ESR) of 55 mm in the first hour. High resolution computed tomographic scan (Figure 1) shows ground glass appearances, mosaic attenuation and traction bronchiectasis mainly in the upper lobes. Echocardiography showed elevated pulmonary pressures, supporting the diagnosis of pulmonary hypertension.

The diagnosis of hypersensitivity pneumonitis was made. The patient was started on corticosteroids and advised to avoid further exposure. Following treatment, she showed significant improvement in her symptoms, including a reduction in cough and dyspnea, and her oxygen saturation improved with supplemental oxygen.

Discussion

This case highlights the importance of considering hypersensitivity pneumonitis (HP) in patients presenting with unexplained respiratory symptoms, especially when there is a history of relevant environmental or occupational exposures. HP remains a complex and often underdiagnosed condition, primarily due to the insidious onset and nonspecific nature of its symptoms.(Hamblin et al., 2022; Mohamed et al., 2020; Shailesh et al., 2022) These symptoms—such as cough, dyspnea, and systemic signs like fever or weight loss—can be mistaken for other common respiratory diseases, which makes timely diagnosis challenging especially in young adults (Morisset et al., 2018; Rafique et al., 2024; Sartorelli et al., 2020). This patient's case exemplifies the necessity of obtaining a detailed history of environmental exposures, more so in regions where close contact with animals, such as poultry farming, is common.

Bird fancier's lung (BFL), a subtype of HP, is one of the most prevalent forms of this disease and is typically linked to exposure to bird proteins found in droppings and feathers. The immune response triggered by inhaling these antigens leads to chronic inflammation, which can progress to fibrosis and severe respiratory dysfunction if left untreated. In this patient, prolonged exposure to poultry in her home environment, coupled with her developing respiratory symptoms, was the likely trigger for her condition (Mohamed et al., 2020; Moua et al., 2022; Petnak & Moua, 2020).

The diagnosis of HP relies on clinical features, a detailed history of antigen exposure, radiologic findings, and, occasionally, serological tests. High-resolution computed tomography (HRCT) is usually enough if the clinical features are supportive for diagnosing HP, as it typically shows ground-glass opacities, centrilobular nodules, and, in later stages, fibrosis. While bronchoalveolar lavage (BAL) can provide diagnostic support by identifying elevated lymphocyte counts, it is not always necessary for confirming HP. In this case, the HRCT findings and the clinical features were pivotal in confirming the diagnosis (Fernández Pérez et al., 2021; Raghu et al., 2020).

Corticosteroid therapy remains the cornerstone of treatment for hypersensitivity pneumonitis, especially in acute exacerbations, as it helps control the inflammatory response and alleviates symptoms. Early intervention is critical to prevent long-term lung damage and the progression to more severe forms of the disease. In this patient, corticosteroid therapy led to significant improvement in her symptoms, including the resolution of dyspnea and improved oxygenation (Anwar et al., 2022; Barnes et al., 2022).

An essential aspect of managing HP is the early identification of the antigen responsible for the disease and the prompt removal of the patient from the source of exposure. While avoiding the antigen is the most effective intervention, additional treatments such as immunosuppressive therapies or antifibrotic agents may be considered for patients with advanced disease or when antigen avoidance is not possible (Barnes et al., 2022; Creamer & Barratt, 2020).

This case reinforces the need for clinicians to consider hypersensitivity pneumonitis in patients with unexplained respiratory symptoms and a relevant exposure history. Early diagnosis and treatment, including corticosteroid therapy and antigen avoidance, are essential to improving patient outcomes and preventing the progression of the disease.

Conclusion

This case highlights the importance of considering hypersensitivity pneumonitis in young adults with unexplained respiratory symptoms and a relevant history of environmental exposure. Early diagnosis, combined with prompt treatment strategies such as corticosteroid therapy and antigen avoidance, is essential in improving patient outcomes and preventing irreversible lung damage. Further research into novel therapies for advanced or refractory HP will be critical in managing more severe cases of this condition.

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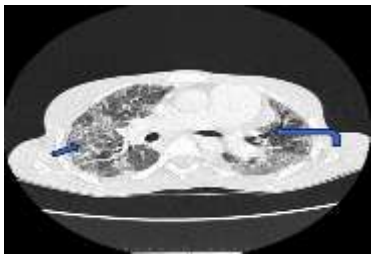

Figure 1. Axial HRCT of the chest showing ground glass appearances with mosaic attenuation (straight arrow) and traction bronchiectasis (Bend arrow) in the upper lobes.