

Pneumocystis Pneumonia Presenting as Nodular Shadows on Chest Radiograph in A Case of Acute Lymphoblastic Leukaemia (ALL)

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Abstract

Pneumonia due to *Pneumocystis jiroveci* frequently occurs in patients with haematologic malignancies. It may have typical as well as atypical presentation and carries high mortality in this group of patients. Hence, a high degree of suspicion is mandatory to arrive at a correct diagnosis, institute appropriate treatment and prevent mortality. We report a case of pneumocystis pneumonia presenting as nodular shadows on chest radiograph in a patient of acute lymphoblastic leukaemia(ALL).

Introduction

Pneumonia due to ascomycetous fungus, *Pneumocystis jiroveci* is a life threatening opportunistic infection. It commonly occurs in patients with HIV disease. However, it has also been reported in patients having haematological malignancy, patients who have undergone organ transplantation, patients on long term steroid therapy and on chemotherapeutic regimens.⁴

Among the haematological malignancies, acute lymphoblastic leukaemia has higher rates of Pneumocystis pneumonia.¹¹

There is an increased risk in this group of patients because of the introduction of more intensive treatment regimen and new anticancer and immunomodulating agents.¹¹

Classically, the patients of pneumocystosis present with dyspnoea, fever, non-productive cough. Chest radiographs exhibit bilateral diffuse interstitial infiltrates extending from the perihilar region. Atypical manifestations on chest radiographs have been reported in

few cases, ranging from normal films to unilateral infiltrates, nodules, cavities, pneumatoceles, lymphadenopathy and effusion.⁴ When the chest radiographs are not typical, the diagnosis might be missed and the patient may be put on empirical treatment leading to its complications.

Hence, high level of suspicion is necessary in immunocompromised patients presenting with respiratory complaints having typical or atypical findings in order to ensure an early diagnosis, an early treatment and prevent mortality.

We report a case of pneumocystis pneumonia in an adult having acute lymphoblastic leukaemia who had atypical chest radiograph showing bilateral reticulonodular shadows.

Case

A 48 year old female patient was diagnosed to have acute lymphoblastic leukaemia in June, 2005. She was given 8 courses of chemotherapy, regimen consisting of methotrexate, 6-mercaptopurine and prednisolone. The last course of chemotherapy was completed in April, 2007.

She was asymptomatic for a period of about 11 months. Maintenance therapy and prophylaxis

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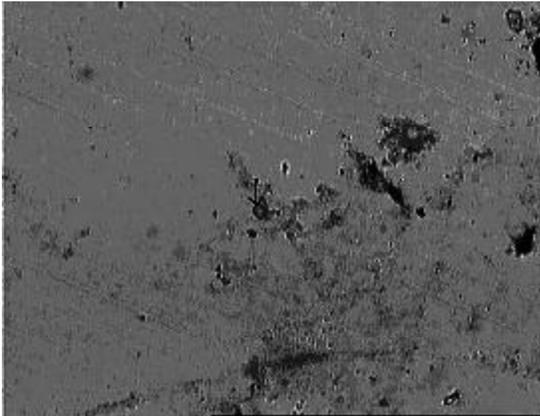


Fig. 1 : Histopathologically it showed *p. jiroveci*.

against pneumocystis was not given and there was no history of hospitalization during this period.

Case findings

In March, 2008, she presented with sudden onset of breathlessness, high grade fever and dry cough of 15-20 days duration. On examination, there was progressive dyspnoea and oral candidiasis. Her systemic examination was found to be normal. Chest radiograph revealed bilateral reticulonodular shadows about 1-2 mm, scattered throughout the lung fields. PO₂ and PCO₂ levels were 48 mm of Hg and 29 mm of Hg respectively. Tests for HIV 1 and HIV 2 were negative. Induced sputum was examined for acid fast bacilli in view of the reticulonodular shadows on chest radiograph. Acid fast bacilli were not detected in induced sputum. She was treated with amoxicillin-clavulonic acid but there was no relief in 48 hours. Her breathlessness worsened. In view of the above findings, Toluidine blue O staining of induced sputum was performed which revealed cysts of *Pneumocystis jiroveci* (Fig.1).

Trimethoprim-sulphamethoxazole was added to the patient's regimen. This improved her clinical condition. PO₂ levels increased significantly from 48 mm of Hg to 122 mm of Hg within 48 hours. Chest radiograph findings improved over a period of 2 weeks and repeat sputum examination after 2 weeks did not reveal cysts of *Pneumocystis jiroveci*.

Discussion

Infections are a major cause of morbidity and mortality in patients with acute lymphoblastic leukaemia. Predisposition is mediated through various abnormalities

including both impairment of humoral and cellular immunity and further due to immunosuppression related to therapy of acute lymphoblastic leukaemia. Among infections in acute lymphoblastic leukaemia, pulmonary manifestations are very common and are often difficult to distinguish from other disorders on clinical grounds.⁸

Pneumonia due to *Pneumocystis jiroveci* is typically more acute and severe in patients without HIV disease, often leading to acute respiratory failure with a need for mechanical ventilation.

Pneumocystis pneumonia has a mortality rate of 30-60% in patients with lymphoproliferative and myeloproliferative malignancies as compared to that of 10-25% in patients with HIV disease.⁶

In a study of HIV negative patients, it was noted that in 90% of cases, steroid therapy was the major risk factor in the development of pneumocystis pneumonia.⁵ The case reported by us was not on steroid therapy for almost a period of 11 months. So immunosuppression due to malignancy itself could have contributed to the risk of pneumonia in this case.

Patients without HIV disease have a significantly lower number of pneumocystis organisms in lungs with more neutrophils than in patients with HIV disease.⁷

This calls for expertise and careful screening of the stained smear of sputum sample.

Chest radiographs of our patient showed a bilateral reticulonodular shadows throughout the lung fields which is an uncommon presentation of pneumocystis pneumonia. This can be confused with miliary tuberculosis and unless diagnosed correctly, the patient may be put on anti-tuberculosis treatment empirically.

Although, some progress has been made in establishing guidelines on when to initiate prophylaxis against PCP in patients with cancer, general recommendations in these patients have not been well established. Further studies are required on these lines.¹¹

Thus, there should be high index of suspicion of Pneumocystis pneumonia in patients of haematological malignancy presenting with common as well as uncommon findings in order to arrive at an accurate diagnosis, management and to avoid fatality.

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MORE OPTIONS TO SCREEN FOR COLORECTAL CANCER

The two new tests, added to five others, are CT colonography (CTC), also known as virtual colonoscopy and stool DNA-testing. Stool DNA- testing will mainly aid the detection of cancer, similar to testing for faecal occult blood.

Sensitivity and specificity from pooled analyses on a per-patient basis is good for detection of polyps and invasive colorectal cancer, less so for flat lesions. If abnormalities are detected, colonoscopy is the next step.

Colorectal cancer can only be prevented and mortality reduced if all screening tests are offered widely and people are made aware of the importance of screening.

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