



ORIGINAL RESEARCH PAPER

Pulmonary Medicine

A RARE CASE OF PNEUMOCYSTIS JIROVECI PNEUMONIA IN CHRONIC KIDNEY DISEASE

KEY WORDS:

Rajkumar Manchikalapudi

Post Graduate Trainee, 2nd Year, Department Of Respiratory Medicine, Meenakshi Medical College And Hospital, Kanchipuram, Tamilnadu.

Krishnapriya Ramachandran*

Associate Professor, Department Of Respiratory Medicine, Meenakshi Medical College And Hospital, Kanchipuram, Tamilnadu. *Corresponding Author

Srinivasan. R

Professor And Head, Department Of Respiratory Medicine, Meenakshi Medical College And Hospital, Kanchipuram, Tamilnadu

ABSTRACT

A 60 yr old male patient who was a stone cutter by occupation presented with complaints of breathlessness fever and cough since 3 days. He was a known case of end stage kidney disease and was on maintenance haemodialysis since 2 years. Serology test for HIV was negative. Chest x-ray was showing infiltrates. After being suspected of pulmonary oedema initially, he was then treated with diuretics and prophylactic antibiotics. With no significant improvement of symptoms and chest x-ray findings, HRCT thorax was done which showed bilateral central reticulo-nodular infiltrates, patchy areas of consolidation and pleural effusion. Bronchoscopy was performed and microbiological investigation of bronchoalveolar lavage (BAL) was suggestive of *Pneumocystis jirovecii pneumonia* (PCP). The incidence of PCP in non-HIV individual with end stage renal disease without organ transplant is very low, this one being one such particular case that we have come across.

INTRODUCTION:

Pneumocystis jirovecii pneumonia (PCP) is a well-known opportunistic infection in human immunodeficiency virus (HIV) - infected patients, and its management has been established. In patients without HIV infection, PCP rapidly progresses, is difficult to diagnose correctly, and causes severe respiratory failure leading to a poor prognosis. It is an opportunistic yeast-like fungus that is found in the pulmonary alveoli of humans^[1]. A patient suffering from PCP generally presents in three different ways: those without HIV have an acute presentation; those with HIV have sub acute presentation; and between 25% to 50% of patients present with little to no symptoms^[2]. Possible symptoms include fever (low-grade with HIV, high fever without), fatigue and/or malaise, dyspnoea, dry cough and pleuritic chest pain. The objective signs of PCP might include low oxygenation, rales upon auscultation, elevated Alveolar-arterial (A-a) gradient, tachycardia and tachypnoea. A chest x-ray will often yield diffuse bilateral infiltrates, pleural effusion, and/or pneumothorax.

CASE REPORT:

A 60 yrs old male who is a known case of Coronary artery disease, severe Left Ventricular dysfunction with ejection fraction of 40% and end stage kidney disease on maintenance haemodialysis since 2 years, and hypertensive since 15 yrs presented with complaints of breathlessness, fever, and cough with minimal expectoration of 3 days duration. There was no history of hemoptysis, no history of copious sputum production. He was a stone cutter by occupation for more than 15 years and had symptoms of frequent cough and cold and blackish sputum production in the past.

On physical examination patient was tachypneic, pale, with elevated Jugular venous pulse and bilateral pitted pedal oedema. His vitals were BP:170/100 mm of Hg ; PR: 100 /min; RR:34/min; Temp:101° F ; SPO₂:85% at room air.

- **SYSTEMIC EXAMINATION:** CVS:S1,S2(+),S3 gallop (+); RS:B/L air entry(+), B/L extensive crepitations (+); P/A: soft, no organomegaly, CNS: No focal neurological deficit.

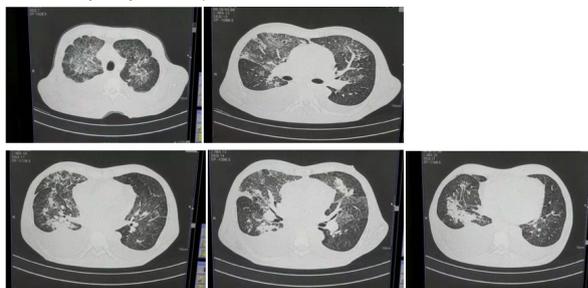
INVESTIGATIONS:

His laboratory investigations were as follows: Hb:6.3 gm/dl, pcv:18%, WBC count:10,400cells/cu.mm, platelet count:2.08 lakhs/cu mm; RBS:116mg/dL, Serum Urea:200mg/dl, Serum.Creatinine:4.8mg/dl, Serum.sodium :132mEq/L, Serum Potassium:6.8mEq/L, Serum Chlorine: 102mEq/L, Serum Bicarbonate:16mEq/L, HIV(elisa): negative, HbSAG: negative; ECG Showed left ventricular hypertrophy; Chest X-ray showed : B/L infiltrates with prominent bronchovascular markings and cardiomegaly.

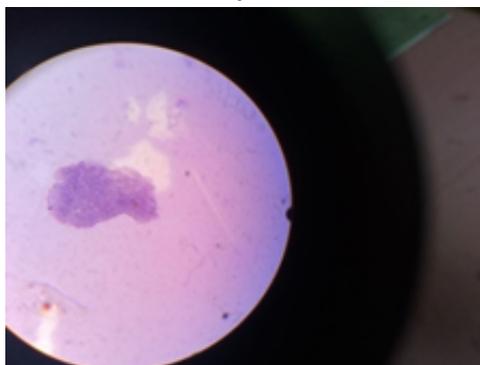
He was suspected to have Acute pulmonary oedema initially and was treated with Inj.Furosemide 40mg (twice daily), antibiotics and other supportive measures and patient was taken for hemodialysis for 2 hrs. However, there was only a marginal improvement in symptoms. Chest x-ray was repeated after 4 days of treatment did not show any significant resolution of infiltrates.

HRCT - THORAX showed bilateral central reticulo-nodular infiltrates predominantly involving the upper lobes, patchy areas of consolidation in lingula and right lower lobe and B/L minimal pleural effusion and minimal Pericardial effusion. A differential diagnosis of silicosis, silico-tuberculosis and PCP were considered.

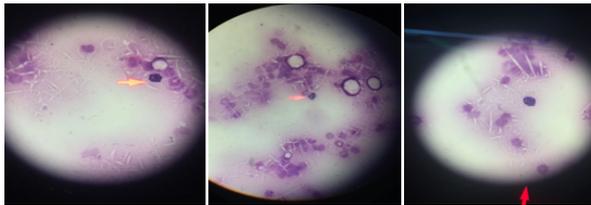
BAL was obtained after Bronchoscopy. Giemsa stain of the lavage fluid showing aggregates of cysts and trophozoites with a granular foam giving a 'Honey Comb' appearance which was suggestive of *Pneumocystis jirovecii pneumonia*.



HRCT-THORAX showing bilateral infiltration and bilateral pleural effusion and minimal pericardial effusion.



Pathological smear focussing on the PCP organism.



Microbiological smear focussing the PCP trophozoites obtained from bronchoalveolar lavage.

DISCUSSION:

Pneumocystis jirovecii is a ubiquitous and opportunistic fungus that is localized in the alveoli of human lungs and causes pneumonia. *Pneumocystis pneumonia* (PCP) remains a frequent cause of infection among immunocompromised patients. About 40% of people who get PCP have HIV infection^[3]. Solid organ transplant recipients are at risk of PCP infection and depends on the type of transplantation and is greater in heart-, lung-, and combined heart–lung transplantation than in kidney- or liver-transplant recipients^[4].

Following table demonstrates the incidence rates of PCP among the ESRD patients, extracted from a cohort study by *Steffen Lethl et al.*^[5]

	NO.	NO. OF PCP	P value
ESRD	13296	58	<0.001
SUBDIVIDED			
-PD		0	
-HD		12	<0.001
-Rtx		46	<0.001

(PD - *peritoneal diagnosis*, HD - *hemodialysis*, Rtx - *renal transplant recipients*)

Among 13296 adult patients with ESRD, 58 first-time diagnoses of PCP were recorded out of which 48 occurred among renal transplant recipients and only 12 among haemodialysis patients, with yielding incidence rates of 181 (95% confidence interval: 136–242) and 43.1 (24.5–75.9) per 100,000 PYFU, respectively. P value being <0.001.

CONCLUSION:

A retrospective study observed that *Pneumocystis jirovecii* outcome is more unfavourable in non-HIV patients compared to HIV affected group^[6]. Patients with end-stage renal disease are at increased risk of opportunistic infections, including *Pneumocystis pneumonia*. Data on occurrence and risk factors for *pneumocystis pneumonia* in this population (ESRD) are very limited. However the available data, points at very low incidence rate in ESRD patients with a negative HIV status. This is one such rare case in ESRD on hemodialysis without renal transplant. We also emphasize that PCP has to be kept in mind as one of the differentials in these group of patients presenting with persistent pulmonary infiltrates not responding to routine treatment measures.

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