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An Unusual Case Of Pneumocystis Jirovecii Pneumonia In Chronic Kidney Disease

Banibandana Nayak[1]
Sarat Kumar Behera[2]
1-Pg In Department Of Respiratory Medicine,
2-Prof & Hod Dept Of Respiratory Medicine
Hitech Medical College & Hospital

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I. 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 subacute 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 tachypnea. A chest x-ray will often yield diffuse bilateral infiltrates, pleural effusion, and/or pneumothorax.

II. CASE REPORT:

A 60 yrs old male who is a known case of Coronary artery disease, severe LV 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 h/o hemoptysis, no h/o 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 pitting pedal edema . His vitals were BP:170/100 mm of Hg; PR: 100 /min; RR:34/min; Temp:101^0 F ; SPO_2:85% at room air;

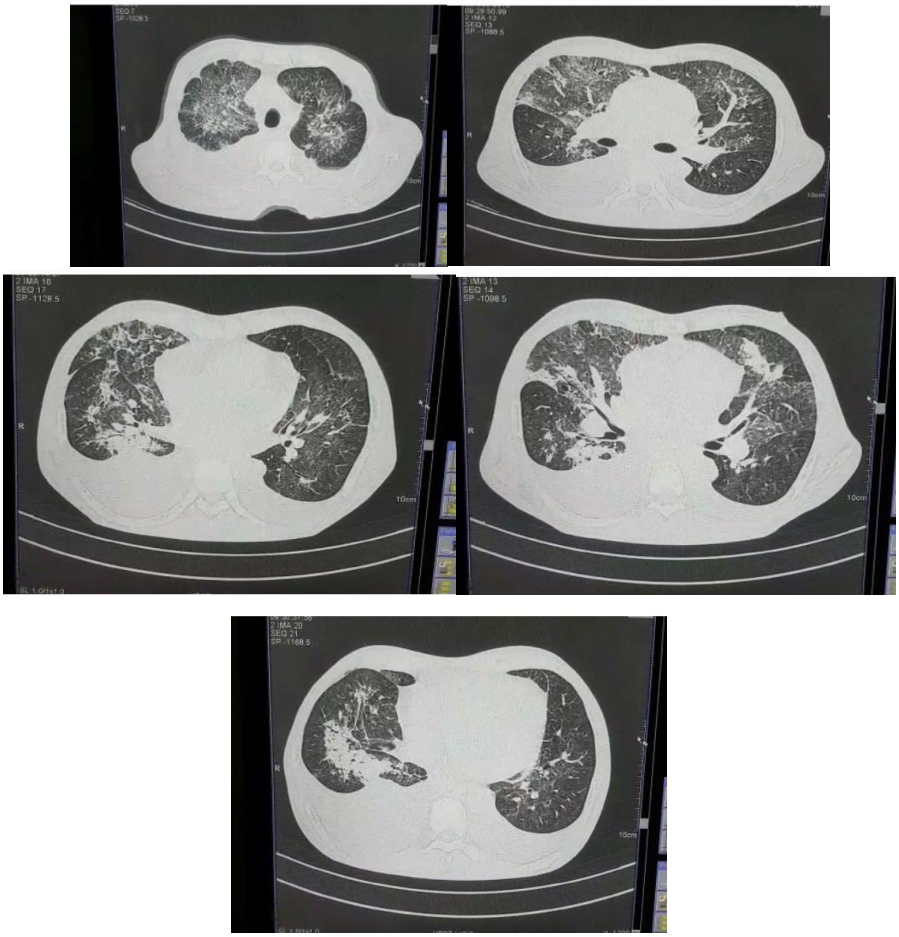
- *SYSTEMIC EXAMINATION*: **CVS**:S1,S2(+),S3 gallop (+); **RS**:B/L air entry(+) B/L extensive crepitations (+); **P/A**: soft,no organomegaly, **CNS**:NFND
- *INVESTIGATIONS:*

His laboratory investigations were as follows: Hb:6.3 gm/dl, pcv:18%, WBC count:10,400, platelet count:2.08 lakhs/cu mm; RBS:116mg/dL, S.urea:200, S.Creatinine:4.8,$S.Na^+$:132, K+:6.8, Cl-: 102, HCO_3:16, HIV: negative, HbSAG: negative; ECG Showed left ventricular hypertrophy; Chest X-ray showed : B/L infiltrates with prominent bronchovascular markings and cardiomegaly.

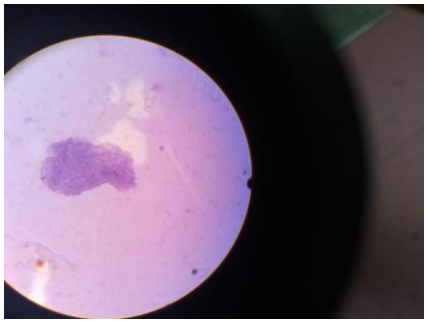
He was suspected to have Acute pulmonary edema initially and was treated with Inj.Furesemide 40mg bd, antibiotics and other supportive measures and patient was taken for hemodialysis for 2 hrs. However, there was only a marginal improvement in symptoms. CXR repeat after 4 days of treatment did not show any significant resolution of infiltrates.

HRCT - THORAX showed bilateral central reticulonodular 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, silicotuberculosis and PCP were considered.

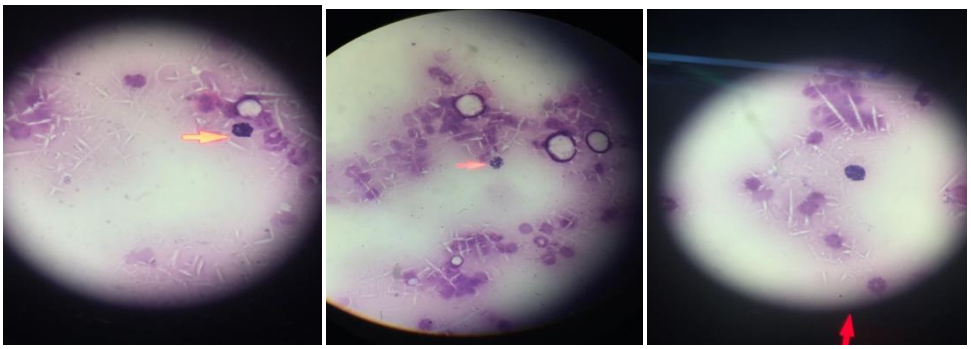
BAL was obtained after Bronchoscopy. Giemsa stain of lavage fluid showing aggregates of cysts and trophozoites with a granular foam giving a 'Honey Comb ' appearance which was suggestive of *Pneumocystis jirovecii pneumonia.*



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.

III. 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 from a cohort study[5].

Table 1. Incidence rates and rate-ratios of PCP among persons with end-stage renal disease (ESRD) and population controls

	No	No of PCP	PYFU	IR (95% CI) (per 100000 person years)	IRR (95% CI)	P
Background	244255	32	2223660	1.43 (1.02 – 2.04)	1 (reference)	
ESRD	13296	58	63560	87.7 (67.8 – 113.5)	60.9 (39.6 – 93.9)	**<0.001**
Subdivided*						
-PD		0	10320			
-HD		12	27840	43.1 (24.5 – 75.9)	29.9 (14.0 – 59.7)	**<0.001**
-Rtx		46	25400	181 (136 – 242)	126 (78.4 – 204)	**<0.001**

ESRD group subdivided in peritoneal dialysis (PD), haemodialysis (HD) and renal transplants recipients with a functioning graft (RTx). * Patients may contribute with risk time in more than one category.

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.

IV. CONCLUSION:

A retrospective study observed that Pneumocystis jerovecii 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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