Case Report

A Rare Case of Idiopathic Pulmonary Fibrosis with Parvovirus B-19 Infection

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Idiopathic Pulmonary Fibrosis (IPF) is a chronic interstitial disease of unknown cause occurring in old age. These patients present to the Emergency Department with frequent exacerbation. Acute worsening of respiratory symptoms in IPF are primarily contributed by pulmonary or nonpulmonaryinfections, pulmonary embolism, heart failure, bronchogenic carcinoma, ischemic heart disease and stroke. However, viral infection are the rare contributing factor in exacerbation of IPF. Here we report a case of acute exacerbation of IPF with cytopenia due to parvo virus B-19 infection.

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Key words **: Dyspnea, Myelosuppression, IPF, CT thorax, Azathioprine, Viral infection.**

Idiopathic Pulmonary Fibrosis (IPF) is defined as a specific form of chronic, progressive Interstitial lung disease of unknown cause occurring primarily in older adults and limited to the lungs. IPF is a diagnosis of exclusion. Median survival of IPF patients is about 2 to 3 years. Usual Interstitial Pneumonia (UIP) is the most characteristics radiological and histopathological pattern of Idiopathic Pulmonary Fibrosis. Acute exacerbation of IPF is characterized by progressive worsening of dyspnea and lung function and is associated with a poor prognosis[1,2]. The incidence of IPF is higher in the sixth to seven decade of life. More men have been reported with IPF. Initial presentation as exacerbation of IPF is rare. Acute worsening of dyspnoea over a few weeks and new ground glass opacities on High Resolution Computer tomography (HRCT) scan thorax with a background of lower lobe fibrotic changes are suggestive of exacerbation. The patients with idiopathic pulmonary fibrosis can require emergency hospitalization during exacerbations. Smoking is the most common risk factor connected to IPF other risk factors are gastroesophageal reflux, chronic viral infections such as Epstein- Barr virus, hepatitis C and a family history of ILD.

Bacterial and viral infections frequently are risk for exacerbations of idiopathic Pulmonary Fibrosis[3]. Parvovirus (PV) is the single stranded DNA virus and one of the smallest virus. The term parvovirus came from the Latin word parvum meaning small. Parvovirus most commonly affects children. PV can cause flue like illness in adults. In rare cases of PV infection cause fulminant pulmonary failure and patients may present with a sudden onset of respiratory distress[4].

Editor's Comment :

- Fungal pneumonia is commonly seen in the immunocompromised host.
- Pulmonary mucormycosis has a high mortality rate because of its angioinvasion nature and associated risk factors as diabetes mellitus and immunosuppression. However, pulmonary mucormycosis can be managed by controlling diabetes, judicious use of steroids,early identification of warning signs, early start of antifungal therapy, and extensive surgical debridement of necrotic material.

Here we report a case of exacerbation of Idiopathic Pulmonary fibrosis presenting as bicytopenia due to addetive effect of Parvo virus B-19 infection and azathioprine induced toxicity.

Case Report

A 60-year-old male non-smoker presented to us with complaints of dry cough for the past 1.5 years followed by breathlessness for 1 year, and now fever for past 2 weeks. During this course of illness he consulted to primary physician and was treated with pirfenidone for 10 months, long term oxygen therapy for 6 months and with tablet azathioprine for the last 15 days. On presentation to us patient was in severe distress with respiratory rate of 28/min, pulse rate 116/min, Blood pressure 100/70mmHg and Spo2 91% on moist oxygen at 6lit/min via nasal prongs. The patient was thin built, had clubbing of grade 3 and was febrile with temperature of 100.4°F. On auscultation Bilateral Fine, bibasilar, end inspiratory crepts (velcrocrepts) were heard.Arterial Blood Gas analysis showed pH 7.40, PCO2 40mmHg, Po2 58 mmHg, HCO3 24.8mmol/L, lactate 1.7mmol/L suggestive of type 1 respiratory failure. Laboratory investigations showed hemoglobin 3g/dl, total leucocyte count 276cells/mm^3, differential count neutrophil 10%,lymphocytes 87%, platelet count 0.15 cells/ mm^3, serum urea 42mg/dl, serum creatinine 1.06mg/dl,PT/INR - 17.3sec/1.34. Serum total bilirubin 1.84 mg/dl, direct bilirubin 1.09mg/

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dl, indirect 0.75 mg/dl. Liver enzymes were in normal range. Serology of different viral markers as Epstein Barr virus IgM Antibody was negative but for Parvo Virus IgM Antibody was positive. Serum PCR for parvo virus B-19 was also Positive. Serum Electrolytes were in normal range value. Viral markers for human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C(HCV) were negative. Sputum smear for Acid fast bacilli was negative. Sputum for Gram stain andculture sensitivity showed no growth of microorganisms. 2D echo-cardiography suggestive ofmild tricuspid regurgitation, dilated Right Atrium and Dilated Right ventricle in favor of pulmonary artery hypertension. Malaria and dengue were. Chest X-ray showed bilateral middle and lower zones reticular opacities (Fig 1). HRCT thorax (Figs 2a & 2b) suggestive of bilateral basal and subpleural honeycombing, with reticulations and tractional Bronchiectasis suggestive of typical usual interstitial pneumonia pattern. On the basis of history, clinical evaluation and HRCT findings a diagnosis of idiopathic pulmonary fibrosis was made. Further comprehensive evaluation of laboratory parameters we found severe leukopenia and thrombocytopenia and positive for parvo virus B-19 infection. Thus we concluded that bicytopenia due to parvovirus B-19 infection and azathioprine induced myelo-suppression as the cause for exacerbation.

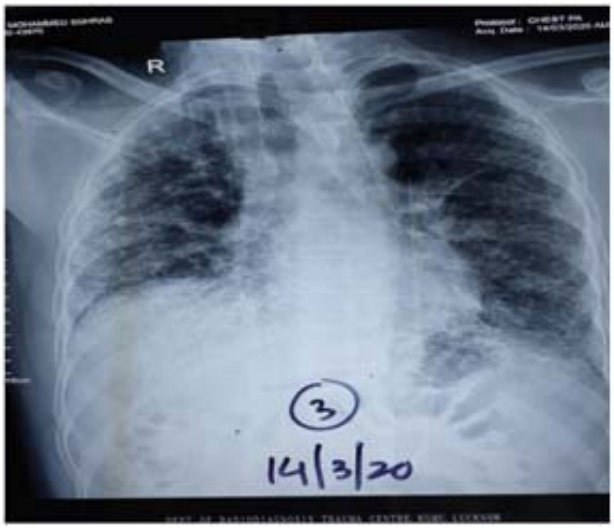
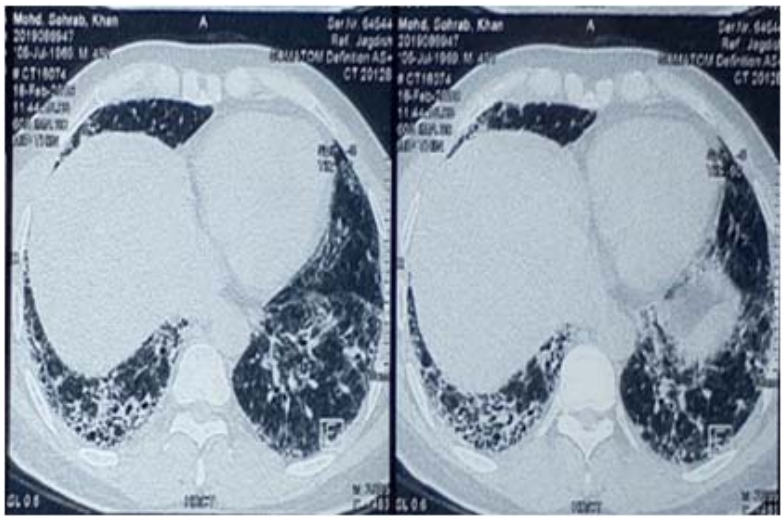


Fig 1 — showing chest x ray – bilateral middle and lower zone reticular shadows. (orange arrows)



Figs 2a & 2b — High resolution computed tomography (lung window) – showing bilateral basal honey combing (red arrow), reticulations (green) and tractional Bronchiectasis (blue arrow)

Patient was on moist oxygen therapy @ 15lit/min vianon rebreathing mask. Intravenous broad spectrum antibiotics piperacillin – tazobactam, amikacin and moxifloxacin, antiviral acyclovir, anti fungalvoriconazole, oral cotrimoxazole prophylaxis was given. Intravenous steroids and other supportive therapy was also given. Intravenous granulocyte- macrophage colony stimulating factor (GM-CSF) 300ug subcutaneous was given for three days. Platelet transfusion was given due to persistent thrombocytopenia for three days. The patient did not respond to the treatment and three days after hospitalization the total leucocyte count and platelet counts did not improve. Eventually the patient remained hypoxemic and was on vasopressor support on third day he was intubated. The patient had been suffered to cardiac arrest and could not be revived.

Discussion

Exacerbation of idiopathic pulmonary fibrosis may be due to variety of factors such as infections of viral, bacterial and mycobacterial origin, pulmonary thromboembolism, congestive cardiac failure, atrial fibrillation etc[3]. In this case azathioprine along with Parvo virus B-19 Infection resulted in severe myelosuppression. which became the contributing factor for exacerbation. The Most infections with parvovirus B19 are asymptomatic but erythema infectiosum is the most common clinical presentation seen in children. The classic slapped-cheek rash is followed by an erythematous maculopapular exanthem on the trunk and limbs. In children, B19 is usually mild and of short duration. Adults tend to be more severely ill than are children, and up to 80% of adults have been reported to have arthralgias or arthritis. Parvo virus B-19 infection usually causes self limiting illness in patients of chronic respiratory disease. Usually Myelosuppression induced by Parvovirus B-19 infection is a rare risk factor for exacerbation of idiopathic pulmonary fibrosis[6]. But in Immunosuppressant patients Parvo virus B-19 infection can cause severe myelosuppression. Low dose azathioprine very rarely causes myelosuppression,but in some individuals due to enzyme deficiency Thiopurine

Methyl Transferase cause by a common genetic polymorphism it can result in severe myelosuppression[4]. The prime pathogenesis of pulmonary complications by PV is not defined but may be is not understood but may be affiliated to cytotoxic effect of the virus directly or indirectlyon the interstitial endothelial cells[7]. An aberrant host immune response triggered by PV may also contribute to the pulmonary pathologybut our case presented with severe hypoxemic respiratory failure with IPF which is a rare manifestation. Till date two drugs Nintedanib and pirfenidone has been approved for the management of IPF[8]. Nintedanib has shown some improvement in the patients of IPF with exacerbation. High cost value of Nintedanib and affordability issues leads to restrict use in India.

The majority of IPF patients are male, greater than 60 years old and smokers. Recent guidelines proposed that IPF patients with exacerbation should be treated with corticosteroids[9]. Some studies reported that acute exacerbation accounts for 40% of IPF deaths. Acute exacerbation of IPF is usually associated with a poor prognosis.

Conclusion

Diffuse parenchymal lung disease is still being mismanaged by prescribing immunosuppressant which has no role in Idiopathic Pulmonary fibrosis. Even though we got drug induced cause of myelosuppression by Patient's history and clinical evaluation itself, we also do comprehensive evaluation of other etiologies which can co-exists together. In our case both Azathioprine and Parvovirus B-19 had additive effect of myelosuppression. To conclude we can say that Parvo virus B -19 Pneumonia can present with severe hypoxemic respiratory failure in patients of chronic respiratory disease.

Limitation : Bone marrow study could not be done as the thrombocytopenia was severe.

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Informed and written consent was taken.

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