Case Report

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Case study: interstitial lung disease with pulmonary arterial hypertension and COR Pulmonale

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Abstract

Interstitial lung diseases (ILDs) encompass a diverse group of conditions characterized by inflammation and fibrosis of the lung tissue, which can lead to impaired lungs function and respiratory failure. Pulmonary arterial hypertension (PAH) and cor pulmonale are common complications of ILDs, resulting from increased resistance in pulmonary circulation and right heart strain. ILDs and PAH and cor pulmonale are often difficult to diagnoses as the symptoms can be non-specific and overlap with other respiratory diseases. Diagnostic tool such as pulmonary function tests, imaging studies and right heart catheterization are used to establish a definitive diagnosis and assess to disease severity. This case study summarizes the patient case of ILDs with PAH and cor pulmonale, including the underlying pathophysiology, diagnostic tool and management strategies. Additionally, we discuss the challenges in diagnosing and managing ILDs with PAH and cor pulmonale, as well as potential future direction in research and treatment.

Keywords: Interstitial lung diseases, Pulmonary arterial hypertension.

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Introduction

Interstitial lung disease (ILD) refers to a group of lungs diseases that affect the interstitium, which is the tissue that surrounds and supports the air sacs (alveoli) in the lungs. The interstitial is composed of network of tiny blood vessels, elastic fibres, and collagen fibres that are responsible for exchanging oxygen and carbon dioxide between the lungs and the blood stream [1, 2].

ILDs can be associated with other medical conditions, such as connective tissue diseases like rheumatoid arthritis or systemic sclerosis, or as a result of infection, such as COVID-19. The treatment and prognosis for ILDs depend on the specific type and severity of disease, as well as the underlying cause [3].

ILDs have been recognized for many years, and the first descriptions of the disease date back to the early 20th century. However, the term 'interstitial lungs disease'' was not widely used until the 1980s, when advances in imaging and diagnostic techniques allowed for better characterization and differentiation of various types of ILDs [4].

Since then, there have been significant advancements in the understanding of the pathophysiology, diagnosis and treatment of ILDs and ongoing research continues to shed light on the complex mechanisms underlying these diseases. While ILDs remain a significant challenge in respiratory medicine, improved understanding and management of these conditions have led to improved outcomes and quality of life for affected individual [5].

Lung tissue becomes scarred as a result of interstitial lung disease. Scarring is a natural occurrence that cannot be reversed. Long -term exposure to some hazardous compounds, autoimmune disease, specific drugs, and other medical disorders and disease also contribute to scarring. The pathologic sequence involves severe inflammation and fibrosis that affect the parenchyma (alveoli, alveolar duct, and bronchioles) in

addition to altering the interstitial lining, which results in reduced gas exchange because of a known case.

Pulmonary arterial hypertension, cor pulmonale, respiratory failure is the primary complications of ILD. The main signs and symptoms include shortness of breath that is present at rest or made worse during physical activities, dry cough, loss of appetite, chest discomfort. In this case report, we describe an interstitial lung disease with moderate pulmonary arterial hypertension with cor pulmonale [7, 8]. ILD is a characteristic of several rheumatic diseases. Osteoporosis is causing the patient significant agony. Osteoporosis is a chronic medical disorder brought on by calcium and oestrogen deficiency. Bone became weak, brittle, and more prone to fracture as a result. The patient has no complaints of diabetic mellitus, hypertension, thyroid problems or cholesterol [9].

Case Report

A 30- year -old female patient was admitted to the TBCD ward with primary complaints of shortness of breath and cough from past 10 days. Current ailment shortness of breath that is steadily progressing and is increased by everyday activity, but not improved by rest. Palpitations, orthopnoea, and tightness in the chest are also present. Cough associated with expectoration which is mucoid, scanty and whitish in nature. Normal blood pressure and temperature, but an elevated pulse rate of 106bpm and an elevated respiratory rate of 32cycles/min.

She has a history of COVID 19 in 2022 and had been in home isolation for 5 months, and she has been diagnosed with pulmonary fibrosis and has been taking deflazacort 30mg and Nintedanib 150mg BD for 3 month and stop and she had been hospitalized due to SOB a month before.

The results of computed tomography (CT) favour ILD. There are obvious interlobar septal thickening, honey combing and diffuse reticular opacities. The x-ray report favours ILD as well. Trachea seems to be in the middle. In the lung fields, multiple reticular opacities are visible.

During her initial hospitalization chest x ray shows: Multiple reticular opacities are seen in lung field. Above features suggest of interstitial lung disease (figure 1A). ECG show sinus tachycardia with low-voltage QRS. CT finding: diffuse reticular opacities, honey combing, interlobar septal thickening(figure 1B) and no any radiography finding of pneumonia. Her sputum was sent for culture/sensitivity test and finding was negative. Her saturation was 85% without oxygen on her admission. On examination, her mucosa was intact, no skin lesion was present on examination of musculoskeletal system she has been suffering from osteoporosis for a long period of time and taking calcium only. There is no any palpable splenomegaly and hepatomegaly with the normal bowel sound. on a laboratory investigation following lab report was found.

Description	Result	Biological reference
Total bilirubin	0.8mg/dl	0-1mg/dl
SGOT	26iu/l	10-40iu/l
SGPT	34iu/l	10-40iu/l
Alkaline phosphatase	135u/l	40-112u/l
Total protien	6.1	6-8.5gm/l
Serum sodium	142	135-145mmol/l
Serum potassium	3.9	3.5-5.1mEg/l
haemoglobin	13.4	12-16g/dl
WBC	9500	4000-11000
RBC	4.86	4.5-5.5millions/cumm
Neutrophils	67	49-74.0%
lymphocytes	26	26-46%
monocytes	02	2.0-12.0%
eosinophils	05	0.0-5.0%
MCV	75.2	80-100fi
MCH	22.9	27-33.0pg
MCHC	30.4	31.0-36.0g/dl
PLATELETS	2.10	150000-40000/ul

Then the treatment was started with broad spectrum antibiotic Inj monocef 1 gm iv, Tab azithromycin 500mg OD to prevent any kind of infection ,other antispasmodic drug was given for her muscles pain cap becosules OD, Tab drotin 1 tab as per need, T fruselac 1 tab OD, as the patient is hypoxemic she had to undergo nebulization with duolin 2.5 ml nasal 6th hrly , budecort 2ml 12th hrlyand Tab acebrophylline 200mg at night time was given for broncho dilatation other nutritional supplement like antioxidant like Tab shelcal OD& cap becosules OD was given , Tab methyl prednisolone 16mg BD as a empirical treatment of ILDs so that she can regain her lungs function.

After a regular follow up and care on TBCD ward, the patient respiratory status improve but her saturation level was still below 90% but still require a regular medication and observation with the oxygen supplement at her home and patient requested for discharge with oxygen therapy and the corticosteroid given should be tapered as per the guidelines and MDI BUDAMATE 400mcg was given on discharge.

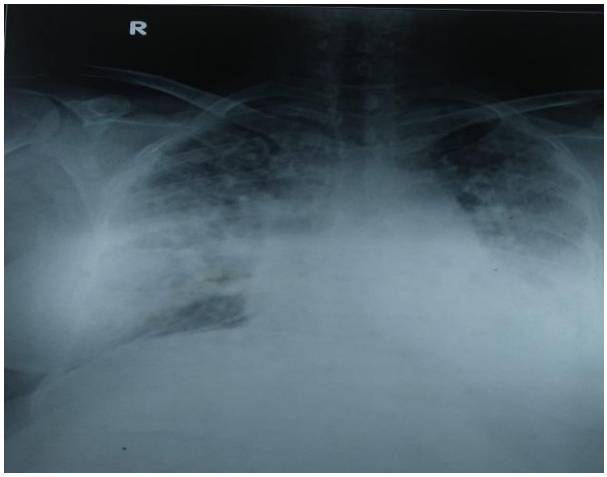

Figure 1 A: Chest x ray shows: Multiple reticular opacities are seen in lung field. Above features suggest of interstitial lung disease

Discussion

The case presented in this article highlights the challenges associated with managing patients with ILD and cor pulmonale. The patient presented with symptoms of dyspnea, cough, and chest pain, which are common in patients with ILD. The initial investigations revealed that the patient had low oxygen saturation levels and signs of cor pulmonale on chest x-ray. The diagnosis of ILD was confirmed on HRCT scan.

The treatment strategy employed in this case involved a multidisciplinary approach, which included antibiotic therapy to prevent any secondary infections, antispasmodic drugs to manage muscle pain, bronchodilators to dilate the airways, and corticosteroids to manage inflammation. The patient also underwent nebulization with duolin and budecort to improve her breathing. Nutritional supplements were given to support her overall health.

The patient was managed in a TBCD ward, where regular monitoring and care were provided. The patient's respiratory status improved, and her oxygen saturation levels increased. However, she still required oxygen supplementation, and the corticosteroid therapy was tapered as per guidelines. The patient was discharged with instructions to continue the medication and follow up regularly with her healthcare provider.

The case presented in this article highlights the importance of a comprehensive and multidisciplinary approach in the management of ILD and cor pulmonale. Such an approach involves the collaboration of pulmonologists, respiratory therapists, nutritionists, and other healthcare professionals to provide optimal care to Patients. The treatment strategy should be tailored to the patient's individual needs and medical history, and

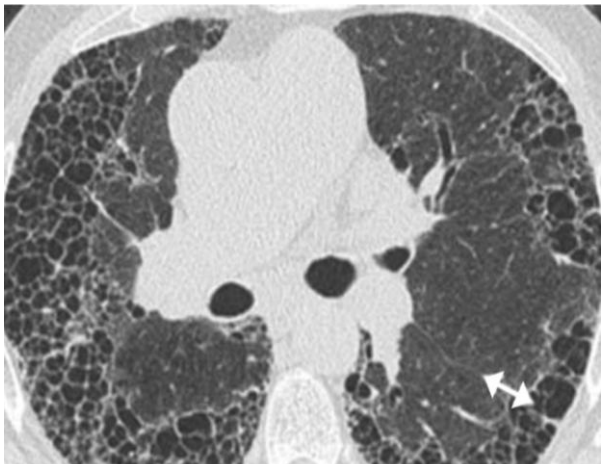

Figure 1B: CT of ILD. There is obvious interlobar septal thickening, honey combing and diffuse reticular opacities

regular monitoring and follow-up are crucial to ensure positive outcomes. Overall, this case underscores the challenges associated with managing ILD and cor pulmonale and the need for a coordinated and holistic approach to care.

Conclusion

This article highlights the importance of early diagnosis and prompt treatment of ILD and its complications, including cor pulmonale. The case report illustrates that a comprehensive approach, including antibiotics,

bronchodilators, antispasmodic drugs, nutritional supplements, and oxygen therapy, can improve the respiratory status of the patient. However, regular follow-up and monitoring are necessary to manage the symptoms and prevent relapse. The case report provides insights into the management of ILD and cor pulmonale and may guide healthcare providers in the treatment of similar cases.

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