



A Case Report on Management and Treatment of a Male Patient Suffering from Interstitial Lung Disease (ILD) or Pulmonary Disease

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Case Study

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ABSTRACT

The present study is a case report of a man who was initially diagnosed with "interstitial lung disease" (ILD) or pulmonary disease which is supposed to be an umbrella term for a large group of disorders responsible for scattered fibrosis of the lungs. It is an irreversible scenario. The causative factors for the above mentioned diseased conditions are yet to be found, and all of them are grouped under interstitial pneumonias. The patient underwent detailed clinical investigations on several parameters such as CT pulmonary angiography, Lower limb venous Doppler, D-dimer test, Real Time polymerase chain reaction (RT PCR) for the novel SARS-CoV -2, Ultra-sonography (USG) of the abdomen, C-reactive proteins (CRP), complete blood count (CBC), *Legionella* antigen test, specific Mycoplasma IgM antibody assay, the total parameters of the renal functioning test of the blood serum, pro-calcitonin (PCT) level, and the acute coronary syndrome panel (POCT). After detailed investigations the patient was diagnosed with ILD and medications specific to the disease was prescribed. The medications that were prescribed were ceftriaxone with injection pantoprazole, paracetamol, levofloxacin, enoxaparin, amiodiprine, and furosemide. He was also advised to continue his own other medications along with these and contact at the emergency services of the hospital in case of any urgency. He was also advised for follow up visit. The patient

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responded to the applied therapeutic interventions and survived from the suffering. Thus, here a detailed case reporting has been conducted with the particular disease along with its diagnosis and management.

Keywords: Interstitial lung disease (ILD); fibrosis; D-dimer; CT pulmonary angiography.

1. INTRODUCTION

The present study is a case report of a man named Mr. A, named to maintain the anonymity as per the regulations of General Data Protection Regulations (GDPR), 2018 [1]. The patient was initially diagnosed with “**interstitial lung disease**” (ILD) or **pulmonary disease** which is supposed to be an umbrella term for a large group of disorders responsible for scattered fibrosis of the lungs [2]. The resulting fibrosis makes the lung tissues extremely stiff due to which there occur a deficit in the level of oxygen within the blood stream [3]. Moreover, it should be also mentioned that the condition of the lungs of the patient gets worsened with time and it is an irreversible scenario. Several people have manifested problems while breathing and along with persistent cough problems [3,2]. The associated complications can become fatal with the development of high blood pressure within the lungs, resulting in the right heart failure and ultimately respiratory failure condition. The causative factors for the above mentioned diseased conditions are yet to be found, and all of them are grouped under interstitial pneumonias [2]. The most fatal condition among them is the **idiopathic pulmonary fibrosis**. The patient was brought to hospital in the emergency section with the following mentioned symptomatic manifestations [3].

1.1 Clinical Symptoms

Mr. A was got admission in the hospital with a history of fever for a period of past one week along with severe difficulty in breathing which showed up for four days. He was taken for admission into another hospital where blood test was conducted with elevated D-dimer values (6843 ng/mL). He was referred to the present hospital for further management of the disease. The prominent symptomatic indications of the patient are detailed as below.

1.2 Clinical Examinations with Pre-medical History

Mr. A showed no signs of surgery in his past and therefore, no indications of operative procedures

for his were noted in the medical case taking book. For further detailed examination, the patient was hospitalized at the intensive care unit and also for the monitoring of the haemodynamically stable condition. Therefore, he was kept within close supervision, where he recovered after three days and was shifted to general ward. Several other detailed investigations were conducted for the confirmation of the diagnosis in which Mr. A revealed moderate level of left ventricular hypertrophy with 2D echo, along with mild level of mitral and tricuspid regurgitation and mild to moderate level of Aortic Regurgitation (AR). The value of the D-dimer was found to be greater than 5000 ng /ml. The patient was also subjected to Real Time polymerase chain reaction (RT PCR) for the novel SARS-CoV -2 strain, however the test report was found to be negative. Among the other investigating parameters CT scan of the thorax was conducted which revealed patchy areas of fibrosis or air trapping was observed within the lungs in the lower lobes along with mild bilateral peribroncho-vascular interstitial thickening. Along with the mentioned findings few atelectatic bands were observed at the right apical lobe and also in the basal segment (anterior) of the left lobe. Apart from these findings the lungs of Mr. A appeared to be normal in terms of all the other parameters such as the trachea, mediastinal vascular structures, lymph nodes, bony thoracic cage, and pleural effusion. Therefore, the above discussed report highlighted or indicated about the sub acute stage of infection or small air passage disease. Then further, US Doppler was conducted of the bilateral lower limb. The findings of the report highlighted that on B mode Doppler study, the veins were with compressible lumen, with sufficient colour filing. However, no such intraluminal filling effect could be noticed. The report showed no indications of deep vein thrombosis as the other parameters were normal.

Ultra-sonography (USG) of the abdomen was conducted and the report revealed normal size, shape and echo-texture of the liver, with no indications of focal lesion or intra hepatic biliary radical dilation. All the other organs appeared to

be normal in all respect. So no such remarks could be obtained from USG of the abdomen. Thereafter, pulmonary CT angiography was also conducted. Contrast enhanced CT study was conducted of the chest with automated injection of 100 ml of omnipaque which revealed signs of patchy areas of fibrosis or air trapping was observed within the lungs in the lower lobes along with mild bilateral peribroncho-vascular interstitial thickening. Along with the mentioned findings few atelectatic bands were observed at the right apical lobe and also in the basal segment (anterior) of the left lobe. Along with these findings few small lymph nodes were also noted.

Among the other significant findings the C-reactive proteins (CRP) was found to be elevated (14.46 mg/L) with normal levels with 0 – 5 mg/L [4]. The detailed investigations also included the complete blood count report of the patient, Mr. A where the WBC total count, RBC, haemoglobin, haematocrit or packed-cell volume (PCV), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), red cell distribution width (RDW), platelet count, differential count such as neutrophil, lymphocytes, monocytes, eosinophil, basophil, were all found to be in the normal range [5]. The indicative sign is the count of neutrophil is slightly higher than the normal limit (7850/ cumm) where the normal limit is 1700 to 7000 [5]. *Legionella* antigen test of the urine was also conducted and the report was found to be negative. The assay was conducted by following the standard protocol

of immune-chromatography [6]. The significant finding of the routine culture of urine is higher residues of proteins (25mg/dl) where the normal limit is up to 10mg/dl. All the other parameters of the routine culture of the urine were within the normal range. Moreover, specific Mycoplasma IgM antibody assay was also conducted by the ELISA protocol [7]. The result was found to be within the normal range concluding no such infections. The significance of this particular assay is that specific Mycoplasma IgM antibodies rise within the body and it reaches the peak within 4 weeks, however it declines extremely fast. Moreover, it has been also noted that the persistence of the antibody may be up to 12 months [7]. The sensitivity of the assay is up to 95% whereas the specificity is up to 93%. In this regard, it should be also accounted if the sample is collected in the initial phase of the disease of the patient, there might not be certain level of antibodies present within the blood. Therefore, if the result remains doubtful the sample of the patient should be repeatedly checked within the next 2-3 weeks [8].

The total parameters of the renal functioning test of the blood serum were also done for the detailed investigation. The several parameters such as the serum albumin, urea, the blood urea nitrogen (BUN), serum creatinine, calcium, random glucose, potassium, sodium, chloride, carbon-dioxide bicarbonate, sodium chloride ratio and the serum phosphorus levels were found to be all within the normal limits. To investigate the risk of diabetes of the patient, glycosylated

Table 1. Vitals and investigation chart

Sl. No.	Parameters	Findings
1.	Heart rate	115 / minute (Normal range: 60 – 100 beats per minute)
2.	Blood Pressure	142/ 100 mm of Hg (Normal range: 120/80 mmHg)
3.	Respiratory Rate	20/min (Normal Range: 12 to 20 breaths per minute)
4.	SpO2 (Oxygen saturation)	On rest was 90% and on exertion was 89% (Normal Range: between 95 and 100 percent)
5.	Chest (with character of sounds)	bilateral vesicular harsh breathing; Bilateral crepitations
6.	Cardiovascular	Systolic murmur
7.	CT pulmonary angiography findings	Patchy areas demonstrating air trapping in both the lungs and these areas were scattered in distribution, observed specially on the lower lobes section. Lower limb venous Doppler was conducted and confirmed no evidence of deep vein thrombosis.

haemoglobin (HBA 1C) of the whole blood collected within EDTA coated vials was conducted. The patient reported of 6.8% which correlated with the diabetic phase (greater than 6.5%) and the pre-diabetic stage is up to 5.7 to 6.4%. In connection to these assays the SGPT (Alanine Amino-transferase) and SGOT (Aspartate Amino-transferase) assays were also conducted. The level of the SGPT was found to be slightly elevated, 46 U/L (Normal range: lesser than 41 U/L).

The pro-calcitonin (PCT) level of the patient was measured by the standard protocol of ECLIA [9]. It was observed that the PCT value was lesser than 0.5 ng / mL (0.464 ng / mL) indicating the condition to be at lower risk for the progression into systemic sepsis. Moreover, further repetition of the test is advised for the confirmation of the diagnosis and also during the progression of the therapy advised [10, 11]. The complete blood count (CBC) of the patient was carried where the report revealed slightly elevated level of WBC of 11200 (3500 -10500 /cumm) and all the other parameters were found to be within the normal range [12]. The neutrophil count was also found to be 8792 /cumm which is elevated against the normal range, 1700 – 7000 /cumm. The prothrombin time with INR was also conducted which is recommended for the vitamin K antagonist (warfarin). The value was within the normal range of 10.4 to 12.6.

The acute coronary syndrome panel (POCT) was also conducted. The value of Creatine kinase-MB (CK-MB) was found to be lesser than 1 ng/mL (0.0 – 4.3 ng/ ml) measured by the help of fluorescence techniques. The cardiac parameters are checked with the notion that if the patient suffers from chest pain or cardiac problems there will be temporal elevations of few parameters such as troponin I, CKMB and myoglobin. These can be used as diagnostic markers for the management of the patients. In addition to this, SARS-CoV -2 antibody test was also conducted for Mr. A and the result was found to be non-reactive. It specifically detects the level of the antibody IgG within the human sera and plasma [13,14]. The patient was found to be diabetic with Point-of-care testing (POCT) level of 159 mg / dl.

2. PRESCRIPTION OF MEDICATIONS

Thus, in overall after detailed investigation of Mr. A the medications that were prescribed were ceftriaxone with injection pantoprazole,

paracetamol, levofloxacin, enoxaparin, amiodiprine, and furosemide [15]. He was also advised to continue his own other medications along with these such as for the type 2 diabetes he was prescribed with metformin, which works with the mechanism of lowered production of glucose from the liver and also augments the sensitivity of the body to hormone insulin, so that the body can utilize it in a much better way, and along with that he was also prescribed with Angiotensin converting enzyme 2 inhibitors (ACE 2 inhibitors) to control his hypertension. Moreover he was also advised to contact at the emergency services of the hospital in case of any urgency. He was also advised for follow up visit for the monitoring of his symptoms for adverse drug reactions or his progress.

3. CONCLUSION

Thus, at last it can be concluded that in the present case report, Mr. A was suffering from unspecified interstitial pulmonary disease along with acute respiratory failure due to hypoxia, type 2 diabetes with long term usage of insulin, essential hypertension, and hyperlipidemia. For the accurate diagnosis, the patient underwent detailed clinical investigations on several parameters. After detailed investigations the patient was diagnosed with ILD and medications specific to the disease was prescribed and was prescribed with medications for the treatment management of the disease. Thus a detailed case representation has been given which could act as a reference to the physicians in future.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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