Short Communication

Novel Disease but Responding To an Old Drug: Role of Prolonged Corticosteroid Use in Prevention and Treatment of Post-Covid Interstitial Lung Disease (PC-ILD)

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Author's Contribution

[1] Conception of study
[1] Experimentation/Study conduction
[1] Analysis/Interpretation/Discussion
[1,2] Manuscript Writing
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Abstract

Coronavirus has affected more than 128 million humans worldwide with invasions in 129 countries across the globe. About 5-10 percent of these patients have pulmonary involvement in the form of COVID Pneumonia leading to ARDS. Although there are no statistics at the moment, trends show that majority will get rid of acute COVID respiratory involvement without any long-term pulmonary complications however several patients will face COVID sequel in the form of post-COVID fibrosis or post-COVID interstitial lung disease. With more and more survivors of COVID-19, long-term pulmonary complications of this infection especially Post-COVID ILD are being recognized by treating physicians as having a great impact on patients' functionality and quality of life. Since there is no research-based internationally accepted strategy to prevent and treat Post-COVID ILD, a strategy based upon observations of treating pulmonologists was devised in the COVID management unit at Sahiwal Medical College Sahiwal to prevent and treat Post COVID interstitial lung disease.

Keywords: Anti-fibrotic, Fibrosis, Post-COVID sequelae, Post-COVID fibrosis, Post-COVID ILD.

Introduction

Since its appearance in Wuhan in December 2019, COVID-19 has taken the world by storm. Coronavirus has affected more than 128 million humans worldwide with invasions in 129 countries across the globe.[1] Initial research work about COVID-19 involved infection control and management of COVID-19 acute complications especially acute respiratory failure. COVID pneumonia can lead to acute refractory respiratory failure.[2] There is an urgent need to address the issue of Post-COVID fibrosis in severely affected COVID pneumonia cases. Many survivors of COVID pneumonia are presenting with post-COVID interstitial lung disease (PC-ILD). Which is a very fearsome complication leading to morbidity and reduced quality of life.[1] Due to lack of trials, there is no consensus about the management of post-covid-19 lung complications including lung fibrosis.[3] Sahiwal medical college Sahiwal COVID management center devised its strategy to cope with this complication including prevention and treatment for post-COVID-ILD.

Post-COVID ILD (PC-ILD)

Interstitial lung diseases also known as diffuse parenchymal lung diseases are a heterogeneous group of diseases that involve lung parenchyma with hundreds of possible causes. A classification system broadly divides ILDs into 2 groups: ILDs with known etiology and ILDs without known etiology. Post-COVID ILD falls in the category of ILDs with known etiology and a new entry in ILD causes after 3 to 4 weeks of the onset of COVID symptoms.[4] Its pathogenesis involves the pivotal role of Angiotensin-converting enzymes, increased expression of TGF-beta, and myofibroblast activation.[1] Risk factors for the development of post-COVID ILD include age, disease severity markers (tachycardia, longer hospital stay, extent of disease at CT), acute respiratory distress syndrome (ARDS), and mechanical ventilation.[2] The most common presentation of post-COVID ILD is exertional shortness of breath which is reported even several weeks after discharge from the COVID facility. There are many patterns of post-COVID ILD in radiology that may show various stages of inflammation. The three most distinct patterns are ground-glass opacities, organizing pneumonia, and honeycombing out of which honey combing is found to be the most severe.[2] Ground glass opacities with or without consolidation, crazy paving pattern, interstitial thickening, and parenchymal bands. These findings are mainly bilateral with a predilection for the peripheries of the lower lobes.[3] Fortunately, most patients with post-COVID ILD tend to improve while a few remain in the static phase or deteriorating phase. Various treatment options are being considered for post-COVID ILD including corticosteroids, Pirfenidone, Nintedanib, and long-term oxygen therapy and lung transplantation.[1]

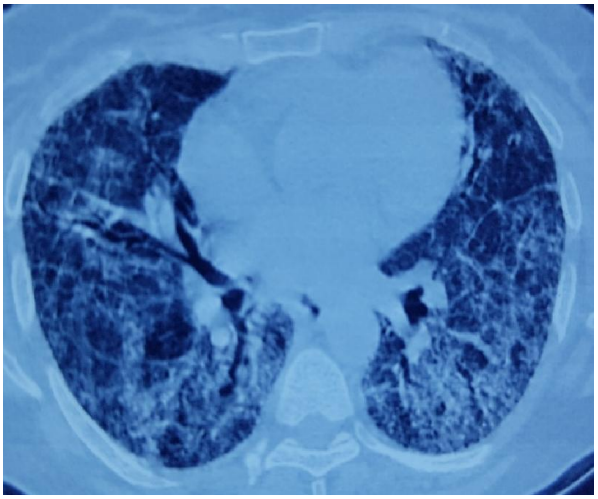

Figure 1: Post-COVID ILD in a 45 years diabetic Male

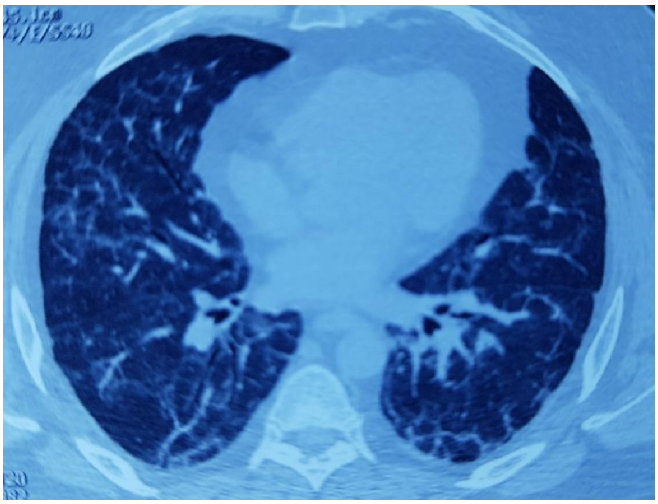

Figure 2: Post-COVID ILD in a 56 years male

Observations at COVID Management center Sahiwal Medical College Sahiwal

Several observations were made during the management of Post-COVID pneumonia cases in the COVID management center at Sahiwal Medical College Sahiwal.

1. The recovery trial led to the selective use of 10 days of Dexamethasone (1.5cc OD) for hospitalized COVID pneumonia cases which

was certainly a practice-changing step (4). However, it was noted that many patients had difficulty in maintaining oxygen saturations immediately after withdrawal of corticosteroids and a considerable portion reported exertional shortness of breath several weeks after weaning. The majority of patients belonging to this group had HRCT changes representing persistent ground-glass haze or organizing pneumonia.

2. These patients were given oral corticosteroids in a tapering dose after 10 days of injectable 1.5cc dexamethasone starting from 30mg daily and reducing the dose weekly in 3-4 weeks. Patients with this regimen weaned from oxygen successfully and reported less shortness of breath however they developed more steroid-induced side effects most commonly proximal myopathy, steroid-induced diabetes, and gastrointestinal side effects which were managed by reassurance, and glucose-lowering agents, and proton pump inhibitors (PPIs). The number of patients with residual fibrosis was very less with this tapering dose of oral corticosteroids.
3. Patients with early administration of oral steroids with minimal symptoms like slight shortness of breath (MMRC-2), a mild drop of oxygen saturation (range from 92-94%), and signs of early disease on chest x-ray and less involvement on HRCT were less likely to develop severe COVID pneumonia and post-COVID lung complications. There was reluctant use of steroids during the early days of COVID-19.
4. Based on the above observations following a treatment plan for prevention of post-COVID fibrosis was developed for admitted cases of COVID Pneumonia which was not earlier developed(Table 1)

Table: 1 Strategy for prevention and treatment of Post-COVID ILD (PC-ILD)

Target Population (Admitted severe cases)	*Severity of Indoor admitted cases of COVID Pneumonia proven either by* *1-Oxygen Saturation less than 94%* *2-Radiological evidence either by chest x-ray or HRCT Chest*
Choice of Corticosteroid for the first 10 days	Dexamethasone intravenous
Patients Criteria for oral corticosteroids after stopping intravenous steroids	1-Patients failing to maintain oxygen saturation after 10 days of dexamethasone 2-Patients having exertional SOB 3-Patients who desaturate on exertion 4-Patients with persistent radiological changes like ground glass haze and organizing pneumonia after 2 weeks[2]
Choice and dose of oral corticosteroid	Prednisolone 0.5mg/Kg with tapering dose
Duration	According to the clinical response (No SOB) and radiological response (Clearing of GGO or Organizing Pneumonia Pattern). 2 weeks to 8 weeks. Depends upon the treating physician.
Observed Benefits	The majority of patients were prevented from developing lung fibrosis which was assessed on chest x-ray. Only a few patients developed residual functional or radiological abnormalities.
Exceptions	Patients with honey combing on HRCT chest or septal thickening were not benefitted from prolonged oral corticosteroid use

Conclusion

1. Oral corticosteroids followed by intravenous dexamethasone in a selected group of patients can be beneficial in preventing and treating Post-COVID ILD.
2. There should be a low threshold considering post-COVID ILD in patients who are difficult to wean from oxygen, have exertional SOB, or have persistent radiological abnormalities.
3. Post-COVID ILD with features like honeycombing and septal thickening can be tried with the use of new anti-fibrotic agents like pirfenidone or nintedanib or their combination.
4. Patients with early stage of COVID pneumonia-like slight shortness of breath (MMRC-2), a mild drop of oxygen saturation (range from 92-94%), and signs of early disease on chest x-ray and less involvement on HRCT can be started with oral steroids to prevent disease progression.
5. However, we found timely and prolonged use of steroids as the best possible and cheap

therapy for the prevention and control of PC-ILD.

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