


# A Short Course of Prednisolone in Patients With Moderate Covid 19 Respiratory Failure- Stop the Progression a Case Series

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## Abstract

Covid 19 positive patients requiring oxygen therapy to maintain saturations above 90% were given a trial of oral prednisolone between 15 and 30 mg until they were weaned to room air maintaining saturations >95%. This treatment resulted in the rapid resolution of worsening respiratory function of 4 Covid 19 positive patients within the High Dependency unit in a tertiary medical center. The cases are from the “first wave” in Trinidad, March 2020. The signs and symptoms of respiratory failure resolved after 72 hours of prednisolone treatment and none of these patients were escalated to non-invasive or invasive respiratory support. The patients were kept for a further 48 hours after the steroids were discontinued to monitor for relapse of symptoms, all patients were discharged home after quarantine. The initiation of a prednisolone steroid trial must be considered in Covid 19 positive patients needing supplementary oxygen therapy or developing worsening shortness of breath. Early Covid respiratory failure responds to a low dose for a short duration and prevents escalation to non-invasive/invasive respiratory support.

## Keywords

covid 19 pneumonitis, hypoxemia, high dependency unit, prednisolone, steroids, infectious disease, pulmonary critical care

## Introduction

At the outbreak of COVID-19 pandemic in March 2020, a parallel health care system was established in the Caribbean territory in which this study is located. This parallel system was devoted to the medical care of COVID-19 positive patients and allowed for the quarantine of this cohort of patients from the general patient population. Since all COVID-19 positive patients requiring supplementary oxygen therapy (level 2 care) were admitted to a designated medical facility, there was an opportunity to manage patients requiring level 2 care in a single location and glean valuable insights from their treatment plans and results.

The author presents case reports of 4 patients whose respiratory care was escalated from the general ward to the High Dependency Unit (HDU). Early in the pandemic, approximately 50% of these high dependency patients progressed to the intensive care unit (ICU) requiring ventilation. High mortality rates in excess of 45% were recorded for these patients requiring ventilation in the ICU.<sup>1</sup> Mortality and morbidity analyses indicated that patients were experiencing a “cytokine storm” with dysregulated immunity.<sup>2</sup> In

response to this, treatment with corticosteroids was subsequently initiated for similar HDU patients on a trial basis. This paper outlines the results of this intervention which resulted in no HDU patients requiring invasive ventilation and no patient mortality during the trial period. There is currently no consensus on the use of corticosteroids in patients experiencing moderate COVID-19 respiratory failure. It should be noted that the use of corticosteroids for patients with severe COVID-19 respiratory failure is not recommended unless the patient has sepsis syndrome.<sup>3</sup> However, there is a precedent of prednisolone use in post-viral pneumonitis resulting from “bronchiolitis obliterans.”<sup>4</sup>

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## Clinical Findings

### Case 1

A 62-year-old male, African, diabetic, hypertensive patient was admitted to the ward after testing positive on the 21st March. He was on Nifedipine, Metformin, Azithromycin, hydroxychloroquine, Tamiflu, Ceftriaxone and was dyspnoeic with SpO<sub>2</sub> 76% on room air leading to admission to the High Dependency Unit on the 22 March. He had bilateral pneumonia on chest X-ray, very short of breath when conversing but able to complete sentences. He was restricted to strict bed rest but his oxygen requirements did not wean until the 30 March when he was started on 20 mg prednisolone daily. His oxygen requirement decreased over the next 48 hours as he was weaned to nasal cannula 2 L/min achieving SpO<sub>2</sub> 98% and less breathlessness. He was allowed to ambulate and was weaned to room air after 4 days and the prednisolone was rapidly tapered as his blood sugar control was difficult. Lactate dehydrogenase on admission to HDU was 1536 U/l (100-190 U/l).

### Case 2

A 65-year-old, male, East Indian, diabetic, hypertensive, obese, Covid positive patient admitted to the ward on 27 March. His therapy at the time was hydroxychloroquine, azithromycin, Tamiflu and Ceftriaxone. He was admitted to the High Dependency unit on the 1st April after needing escalating oxygen therapy and worsening shortness of breath (60% venti-component with SpO<sub>2</sub> 92%). He needed a sliding scale of insulin to control his very labile blood sugar and prednisolone 30 mg was initiated after 5 days of shortness of breath and hypoxia. His oxygen requirement markedly reduced over 3 days and he was able to maintain SpO<sub>2</sub> 95% on 1 l/min nasal cannula. The prednisolone was rapidly weaned over another 4 days as his blood sugar was even more difficult to control, he was then allowed to full ambulate. Lactate dehydrogenase on admission to HDU 1345 U/l (100-190U/l).

### Case 3

A 41-year-old, female, East Indian, asthmatic on inhalers admitted to HDU on 28 March with shortness of breath and supplementary oxygen venti-component 60% to achieve SpO<sub>2</sub> 95% (85% on room air). The patient had shortness of breath from the 26 March and worsening wheeze; he was taking salbutamol, symbicort, azithromycin, tamiflu, co-amoxiclav, and hydroxychloroquine. On 29/3, her chest was more productive (yellow sputum), and her antibiotics were changed to Ceftriaxone and his SpO<sub>2</sub> maintained at 88% on a 60% venti-component.

She remained oxygen dependent until the 1 April when he was started on oral prednisolone 30 mg daily and continued

his salbutamol and ipratropium bromide, his oxygen was weaned to room air on the 3 April when he maintained oxygen saturation of 98%. She continued to have a mild wheeze which subsided on the 5 April and the prednisolone was weaned over the next 2 days as he remained on room air. He was discharged on the 6 April to the ward, asymptomatic and well. Lactate dehydrogenase on admission to HDU 1358 U/l (100-190 U/l).

### Case 4

A 78-year-old, male, African, hypertensive patient was admitted to the ward on the 4 April after testing positive for Covid the day before. He developed progressive delirium and hypoxia leading to admission to the High Dependency Unit, his SpO<sub>2</sub> on admission was 91% on a 60% venti-component. He was very agitated and confused, 15 mg prednisolone was commenced on the 6 April as his oxygen requirements remained high and strict bed rest was ordered. His treatment on admission to the HDU included azithromycin, Tamiflu, Ceftriaxone, and Omeprazole. Saturations improved over the next 4 days and he was placed on nasal specs and allowed to ambulate. The prednisolone was weaned over the next 3 days, and the patient was discharged to the ward. Lactate dehydrogenase 1246 U/l (100-190 U/l).

The post CRP/LDH result was the result prior to ward discharge.

## Diagnosis

Four (4) patients admitted to the High Dependency Unit diagnosed with moderate respiratory failure secondary to PCR positive Covid 19.

## Therapeutic Intervention

Prednisolone therapy was initiated after patients needed oxygen therapy to maintain saturations >90%, these patients remained hypoxic for 72 hours within the HDU prior to the initiation of prednisolone therapy. The dose varied as we have a high percentage of diabetes in our population so glycemic control was difficult. The dose of prednisolone was between 15 and 30 mg and this treatment continued until the patients were maintaining saturations >92% and relief of dyspnoea.

## Outcome

There was resolution of dyspnoea and oxygen dependency within 72 hours of initiation of steroid therapy. The dose varied from 15 to 30 mg and within 48 hours all patients were weaned to nasal cannula and there was a marked improvement in chest tightness and dyspnoea. The course of prednisolone therapy varied from 3 to 7 days with patients not

**Table 1.** Table of P/F ratios and pre/post inflammatory markers.

	CASE 1	CASE 2	CASE 3	CASE 4
P/F ratio	214	110	238	120
Pre crp/ldh	110 mg/L//1536U/l	105 mg/L//1345U/l	115 mg/L//1348U/l	130 mg/L//1246U/l
Post crp/ldh	35 mg/L//620U/l	65 mg/L//540U/l	30 mg/L//365U/l	45 mg/L//285U/l
<sup>a</sup> Echo	No echo done	Normal	No echo done	EF 45%

<sup>a</sup>All echo results were from bedside echocardiogram in order to rule out right heart strain (probable PE) and LVF.  
PE, pulmonary embolism; LVF, Left ventricular failure.

needing maintenance steroid therapy during the recovery phase. All patients were subsequently discharged from the institution after having 2 negative nasopharyngeal swabs. There was no readmission for respiratory support.

## Conclusion

Initiation of a “prednisolone trial,” if Dexamethasone is not available, should be considered in Covid 19 positive patients needing supplementary oxygen therapy or developing worsening shortness of breath. Early Covid respiratory failure responds to a low dose for a short duration and prevents escalation to non-invasive/invasive respiratory support.

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## Ethics Approval

Ethics approval was obtained by the hospital’s ethics committee for this publication

## Informed Consent


Verbal consent was obtained for the patients involved in the case presentation.

## Consent for Participation

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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