

Case Report

Rapid Clinical and Radiological Improvement in a Patient with Severe COVID-19 Infection Treated with Convalescent Plasma

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Abstract: The COVID-19 pandemic has affected more than 100 million people worldwide. One of the major presentations is pneumonia. Patients are classified as severe when they have an arterial oxygen saturation of less than 94% on breathing room air. We present a case of a healthy 29-year-old man who had severe COVID-19 pneumonia and responded dramatically to two doses of convalescent plasma. This case underlines the importance of administering the plasma in the first few days of the disease.

Keywords: COVID19; convalescent plasma; pneumonia



Citation: Malnick, S.; Ghannam, W.; Sharb, A.A.; Alin, P. Rapid Clinical and Radiological Improvement in a Patient with Severe COVID-19 Infection Treated with Convalescent Plasma. *Reports* **2021**, *4*, 15. <https://doi.org/10.3390/reports4020015>

Academic Editor: Jesús Devesa

Received: 28 February 2021

Accepted: 14 May 2021

Published: 19 May 2021

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1. Introduction

The coronavirus disease 2019 (COVID-19) pandemic is the major public health disease of this century, having affected more than 100 million people.

The use of convalescent plasma collected from previously infected individuals to passively transfer antibodies in order to protect or treat humans dates back almost 100 years [1].

Multiple studies have now reported the use of COVID-19 convalescent plasma to treat COVID-19 patients. The evidence has been inconsistent [2–7]. A Cochrane systematic review did not determine efficacy [8]. More recent evidence suggests a benefit from early administration [9], and a recent American Association of Blood Banks (AABB) interim guideline supports early administration [10].

We present a case of a rapid clinical and radiological improvement in a patient with severe COVID-19 infection following treatment with COVID-19 convalescent plasma.

2. Case Report

A 29-year-old generally healthy male with no smoking history presented to the ER with dyspnea, fever, and cough for about 10 days before his admission; in the ER his blood pressure was 108/69 mmHg, pulse at 90 per min, fever of 38.2 °C, and oxygen saturation of 95% on room air. His blood analysis showed a mild lymphopenia of 0.9 K/ μ L, D-Dimer of 0.6 μ g/mL, normal liver and kidney function tests with no electrolyte imbalance, and his C-reactive protein was 13.6. The chest-X-ray revealed bilateral pulmonary infiltration (Figure 1), and a nasal swab was positive for SARS-COV-2 RNA. Initial treatment in the emergency room consisted of I.V ceftriaxone at 1 gm intravenously.

The patient was administered to the corona department with the diagnosis of pneumonia due to SARS-COV-2. The oxygen saturation rapidly decreased to 90% on room air.

He received COVID-19 convalescent plasma in accordance with a protocol approved by the Israel Ministry of Health (Jerusalem, Israel). Since this was early in the pandemic, the titer of antibodies in the plasma was not recorded. He was treated with one unit of plasma per day for 2 consecutive days, together with dexamethasone 6 mg once daily and enoxaparin 40 mg subcutaneously for 4 days. Within 2 days there was a dramatic response with relief of dyspnea, normalization of oxygen saturation, and radiological resolution (Figure 2). Upon discharge 2 days later, there was an elevation in the liver enzymes, with

an AST of 45 iu/L and ALT of 104 iu/L. The patient was discharged early with community care from his HMO because of the pressure on hospital beds for COVID-19 patients.

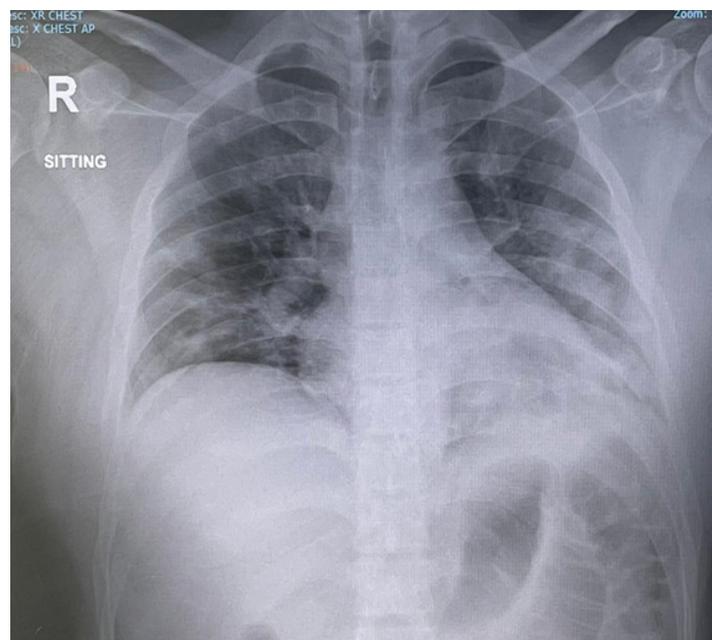


Figure 1. Chest X-ray showing bilateral lung infiltrates.

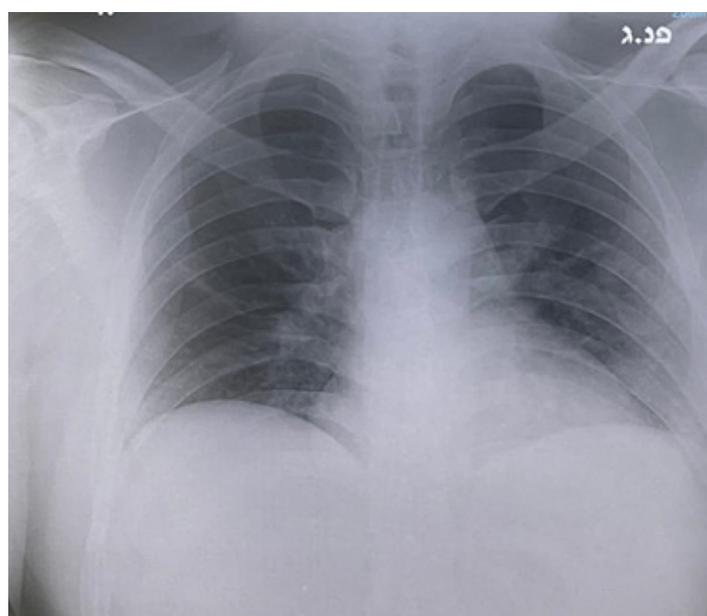


Figure 2. Chest X-ray after convalescent plasma showing significant resolution of the pulmonary infiltrates.

One month following discharge, on a follow-up at a COVID-19 recovery clinic, he complained of chest pain, palpitations, severe fatigue, 7-kg weight gain, tinnitus, and decreased libido. Physical examination was normal, and blood analysis showed slight elevation of liver enzymes, with an AST of 83 iu/L and ALT of 134 iu/L. These levels slowly returned to normal over the next 2 months. The stress echocardiography was normal, as were the routine lung function test and a further chest X-ray. Long COVID-19 symptoms were not a recognized entity early in the pandemic, but it is possible the patient's were related to the administration of the plasma after the first few days of his illness.

3. Discussion

We present a case of a 29-year-old healthy man who was admitted with severe COVID-19 pneumonia. The patient had a predicted 30-day risk for mortality of 26.9% based on a predictive score that has recently been developed [11]. Despite his severe disease, he responded quickly to therapy including convalescent plasma, and was discharged four days after admission with a normal chest X-ray and normal arterial saturation. The therapeutic protocol in our unit at the time of his admission was to administer to patients with an arterial oxygen saturation of less than 94%, oral dexamethasone, enoxaparin, and also convalescent plasma in the first 3 days of admission, regardless of how long the symptoms were present. We did not treat patients with individual components of this protocol in view of the poor prognosis for hospitalized patients. This dramatic response is consistent with the experience from the medical literature. The reason for the initial disappointing results with plasma was that it was administered too late—on average 8 days after symptoms developed [9].

The experience of the Mayo Clinic Expanded Access Program (EAP) [4] and the recent trial from Argentina [6] have emphasized the need for prompt administration of plasma. An analysis of the 3082 patients in the EAP found that high-titer plasma administered in the first 72 h of hospitalization gave a significant benefit compared to those who received plasma later. The Argentinian trial of 160 patients who received plasma within 72 h of symptoms, there was a 52% reduction in the risk for developing severe respiratory disease.

The protocol of treatment we employed included administration of dexamethasone orally. The main effect of dexamethasone seems to be in increasing the number of ventilator-free days but not on mortality [12]. In addition, Joyner et al. found that there was no effect of steroids in addition to convalescent plasma (4)—thus, the titer of the antibodies is the critical element.

Interim recommendations from the AABB include the need to give convalescent plasma as close to symptom onset as possible [10]. There is, however, still an effect of later administration. A trial from Iraq with administration of convalescent plasma after a mean of 15 days found a reduction in both recovery time and mortality compared to the control group [13]. In addition, another trial found a benefit in patients with a median of 17 days from onset of illness to hospitalization [14]. It is clear, however, that for patients who require mechanical ventilation, convalescent plasma is of no benefit. We have also seen a dramatic return of the sense of taste and smell in a 65-year-old lady after just the first dose of convalescent plasma [15].

Convalescent plasma is relatively cheap and easily available. In view of the slow roll-out of vaccinations worldwide, it is to be expected that in many countries there will be large numbers of new cases in the remaining months of 2021, and the judicious and timely use of convalescent plasma could reduce morbidity and mortality related to COVID-19 infection.

Funding: This report received no external funding.

Institutional Review Board Statement: A clinical report without identifying the patient does not require approval in Kaplan Medical Center.

Informed Consent Statement: Written informed consent has been obtained from the patient.

Data Availability Statement: The data is available on the electronic medical record system of Kaplan Medical Center.

Conflicts of Interest: There are no conflict of interest to declare.

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