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COVID-19, a self-limiting disease - A case report of a severe COVID-19 pneumonia patient with multiple comorbidities successfully treated without antivirals

COVID-19, una enfermedad autolimitada: informe de un caso de un paciente con neumonía grave por COVID-19 con múltiples comorbilidades tratado con éxito sin ningún antiviral

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SUMMARY

COVID-19 pneumonia is a communicable disease with no definite therapy. Therapeutic recommendations are still evolving based on ongoing studies and clinical trials. Patients with comorbidities, such as obesity and diabetes, are at risk for developing more severe diseases with higher mortality rates. A number of antivirals, such as oseltamivir, favipiravir, and remdesivir, have been proposed as a treatment for COVID-19, especially in severe diseases. However, the World Health Organization (WHO) initially does not recommend any antiviral therapy. Appropriate management, including oxygen, anti-inflammation, and anti-coagulant, is recommended as the main guideline to provide appropriate treatment with minimal side effects. This case report aims to highlight a severe COVID-19 pneumonia patient with multiple comorbidities who was successfully treated without any antiviral.

Keywords: *COVID-19, antiviral, inflammation, obesity, diabetes, communicable disease.*

RESUMEN

La neumonía por COVID-19 es una enfermedad transmisible que no tiene una terapia definida. Las recomendaciones terapéuticas aún están evolucionando según los estudios y ensayos clínicos en curso. Los pacientes con comorbilidades, como obesidad y diabetes, corren el riesgo de desarrollar una enfermedad más grave con una mayor tasa de mortalidad. Varios antivirales, como oseltamivir, favipiravir y remdesivir, se han propuesto como tratamiento de la COVID-19, especialmente en enfermedades graves. Sin embargo, la Organización Mundial de la Salud (OMS) inicialmente no recomienda ninguna terapia antiviral. Se recomienda como pauta principal un manejo adecuado, que incluya oxígeno, antiinflamatorios y anticoagulantes, para proporcionar una terapia adecuada con efectos secundarios mínimos. El propósito de este informe de caso es resaltar un caso de paciente con neumonía grave por COVID-19 con múltiples comorbilidades que fue tratado con éxito sin ningún antiviral.

Palabras clave: *COVID-19, antiviral, inflamación, obesidad, diabetes, enfermedad transmisible.*

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INTRODUCTION

COVID-19 pneumonia is an infectious disease caused by the SARS-CoV-2 virus. Most of the COVID-19 patients had comorbidities, such as hypertension, diabetes, chronic obstructive pulmonary disease, and malignancy, with a prevalence of about 25,2 %-50,5 %. Patients with comorbidities are at risk for developing more severe diseases with higher mortality rates. Augmentation of preexisting chronic inflammation caused by SARS-CoV-2 infection might explain the higher morbidity and mortality (1-3). Most viral diseases, except those caused by human immunodeficiency virus, are self-limited diseases as patients will recover without taking any form of antiviral. However, antiviral medications may be given in certain COVID-19 instances, particularly in severe or life-threatening diseases, as well as in adult patients who do not require initiation of oxygen but are at risk of hospitalisation or serious illness. To our knowledge, none of the antiviral medications for COVID-19 provide constant and effective results.

Case Report

A 27-year-old male patient was admitted to the emergency unit with a fever and cough. There is no shortness of breath or anosmia. He had multiple comorbidities, which were hyperuricemia, dyslipidemia, and type 2 diabetes; he routinely consumed febuxostat, atorvastatin, and metformin. The patient worked as a general practitioner in the primary health center and had close contact with his brother, who was confirmed with COVID-19 ten days before. On physical examination, the patient was awake and alert. The hemodynamic state was stable. He was afebrile. His body mass index was 39,2 kg/m^2. Fine crackles were heard in both lungs. Cardiac, abdominal, neurological, and extremity examinations were normal. His initial complete blood counts and electrolytes were normal, with C-reactive protein (CRP) of 3,5, IL-6 of 9,762, and D-dimer of 510. PCR test showed positive results with CN 14,83-16,98. His chest radiography showed pneumonia (Figure 1a). The patient was assessed as non-severe COVID-19 pneumonia with metabolic syndrome and treated with symptomatic therapy.

On the fifth day of admission, the patient complained of worsening symptoms, difficulty in the expectoration of sputum, heavy breathing, nausea, and vomiting, and also a decrease in appetite. He presented tachycardia, tachypnea, and desaturated. Blood test results showed increased IL-6 of 69,07, CRP of 5,6, D-Dimer of 1310, and decreased PF ratio in blood gas analysis of 215. Chest radiography evaluation showed a new pulmonary infiltrate (Figure 1b). The patient was diagnosed with severe COVID-19 pneumonia with mild acute respiratory distress syndrome (ARDS). Dexamethasone injection was given at 6 mg every 24 hours. The patient was also treated with a heparin pump at a dose of 10 000 units in 24 hours. On the seventh day, the patient still felt heavy breathing and chest pain when coughing. Blood test results showed increased IL-6 of 104,100 and CRP of 10 (Figure 2). Close monitoring was carried out. No antiviral treatment was given.

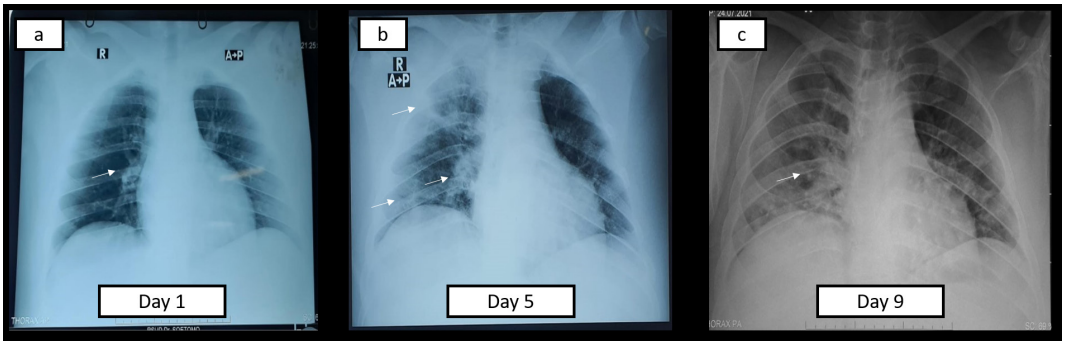

Figure 1. Chest radiographic progression. Initial chest X-ray (a) showed a right pericardiac possible pulmonary infiltrate. On the 5th day (b), air space consolidation opacities are at the periphery of the right lung and the midzones. On the 9th day follow-up chest X-ray (c), the consolidation was partially resolved along with clinical improvement.

On the ninth day of treatment, the patient was feeling better. The cough became infrequent, with no dyspnea and no nausea or vomiting. On physical examination, the patient was awake and alert. The hemodynamic state was stable: blood pressure 135/89 mmHg with heart rate 80 bpm, respiratory rate 22 breaths per minute, oxygen saturation 98 % with nasal cannula 4 lpm. Along with improvement of the patient's clinical state, his laboratory examination showed improved PF ratio with lower levels of IL-6 and CRP (Figure 2). Dexamethasone injection was stopped. The patient was treated for a few days, then self-isolated on the 12th day of treatment.

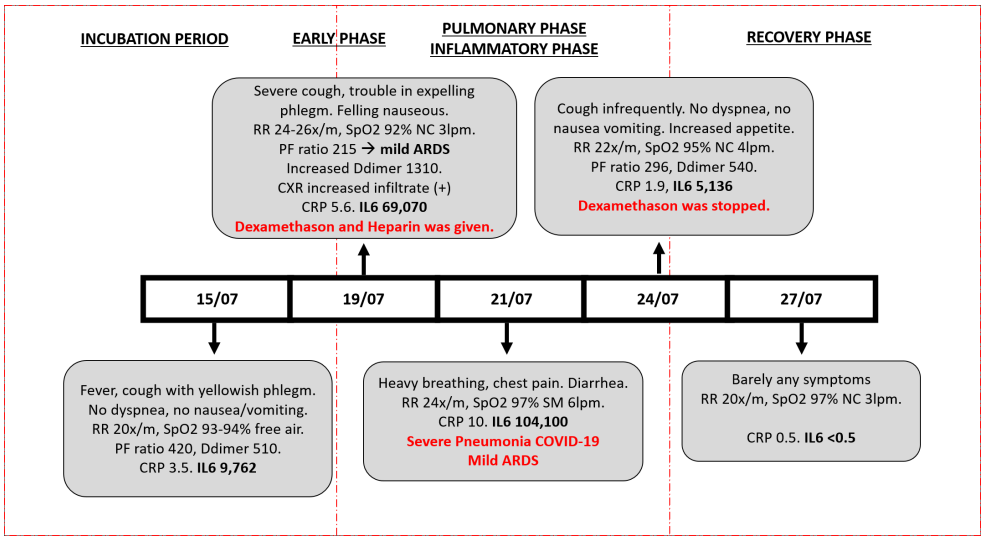

Figure 2. Timeline of the clinical course of the case report.

DISCUSSION

Pneumonia is a common and potentially life-threatening complication of COVID-19 caused by SARS-CoV-2 (severe acute respiratory syndrome-coronavirus-2) virus. Isolation is the primary therapy for every patient, whether in hospital or self-isolated. Other treatments depend on the degree of COVID-19 disease. The treatment of COVID-19 pneumonia is typically aggressive, given the high risk of mortality (death) in hospitalized people. In general, treatment for COVID-19 consists of antiviral drugs like remdesivir, anti-inflammatory like corticosteroids (e.g. dexamethasone) to reduce lung inflammation, anti-coagulant, antibiotics to prevent or treat a secondary bacterial lung infection, and some additional therapies such as supplements and vitamins. Supportive therapies are sufficient for mild and moderate symptoms, including antipyretic, nutrition, and adequate rehydration (4).

The known therapies have been not so effective in treating COVID-19 pneumonia. Hundreds of agents have been tested in over 10 000 registered clinical trials for COVID-19 in the past three years. However, most trials have lacked either randomization and/or sufficient power to provide high-quality evidence of efficacy and safety (5), and many were duplicative. Some small-scale trials have reported conflicting results with drugs such as hydroxychloroquine, resulting in wasted resources and potential toxicity. Many trials have not been designed with suitable clinical endpoints endorsed by regulatory agencies or could not meet protocol-specified procedures owing to difficulties such as self-isolation, travel limitations, and the emergence of new variants with heterogeneous patterns of disease progression and severity (6). Most antiviral was considered in severe or life-threatening COVID-19 cases despite unclear

clinical evidence. Several antivirals have been repurposed for treating COVID-19 with mixed results in clinical settings. To date, more than ten antiviral agents have been marketed for COVID-19 treatment. The treatment window of antiviral agents is probably limited to the viral phase of SARS-CoV-2 infection. For outpatients with mild-to-moderate COVID-19, early antiviral treatment needs to reduce the risk of progression to severe COVID-19. However, current marketed antiviral agents, except for oral nirmatrelvir–ritonavir and molnupiravir, are delivered by injection often in hospitals and infusion centers, limiting their practical administration in outpatient and resource-limited settings. In addition to antiviral agents, over-the-counter medications such as acetaminophen (paracetamol) are also effective for relieving COVID-19 symptoms such as fever, although they cannot eliminate coronaviruses (7). Remdesivir was one of the promising antiviral therapies at the beginning of the pandemic. However, considering this drug's side effects and costs, with unclear evidence of benefits, WHO has not recommended routine use since December 2020 (8). Based on this recommendation, no antiviral was given in this case, and close monitoring was carried out.

During the course of the disease, COVID-19 transitions from an acute viral to a largely immunologic disease. Inflammation in COVID-19 mainly occurs seven days after the onset of symptoms and is characterized by an increase in inflammatory markers such as C-reactive protein (CRP), ferritin, interleukin (IL)-1, and IL-6 (9,10). Several studies have shown a strong correlation between serum IL-6 levels and impending respiratory failure. Figure 2 shows that the patient's clinical course worsened with increased inflammatory markers, including IL-6 and CRP, in the present case report. The maximal level of IL-6, followed by CRP level, was highly predictive of the need for mechanical ventilation. This suggests the possibility of using IL-6 or CRP levels to guide the escalation of treatment in patients with COVID–19–related hyperinflammatory syndrome. Evaluating dynamic changes in IL-6 levels is essential to recognize disease progression and predict cytokine storms (11). Systemic corticosteroids as anti-inflammation are expected to prevent pulmonary injury when given in the "right dose, right time, and right patient." Dexamethasone 6 mg once daily for up to 10 days can decrease mortality in COVID-19 patients, especially those receiving oxygen or on mechanical ventilation (8-10); for patients with non-severe COVID-19 infection, WHO suggests not to use systemic corticosteroids. In addition, in adults with non-severe COVID-19, corticosteroids were even associated with worse clinical outcomes, including more extended hospital stays and a higher risk of disease progression (12). In the present case, the patient got a dexamethasone injection on the fifth day of treatment when he was diagnosed with severe pneumonia with mild ARDS. Dexamethasone was then discontinued as severe signs and symptoms were no longer present. On the ninth day of treatment, the patient got better and self-isolated.

CONCLUSION

Pneumonia COVID-19 infection is caused by the SARS-COV-2 virus, which can appear as an asymptomatic case and a severe disease that causes sepsis and respiratory failure. Patients with comorbidities are at risk for developing more severe diseases with higher mortality rates. It is not clear that antiviral medications provide constant and effective results. Therefore, antiviral therapy is not mandatory. As COVID-19 is a viral infection, it is a self-limiting disease that depends on the patient's immunity. Appropriate management according to the phase of the disease is the main guideline to provide appropriate therapy with minimal side effects. This learning point should be a guide in the future when addressing viral pandemics.

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