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COVID-19 Case with Unilateral Pneumonia: Case Report

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Abstract

We present a case of unilateral COVID-19 pneumonia in a patient without comorbidities. The patient was treated with chloroquine and azithromycin. Symptoms included a cough that, after three days, was associated with fever, myalgias, and anorexia, which resolved after ten days. This case presents a valuable opportunity to examine the progression of chest CT findings in COVID-19 pneumonia and the associated clinical course of symptoms. The involvement of a small lung area with mild symptoms, rather than the bilateral ground-glass pattern typically observed with severe respiratory symptoms, could provide new insights into the disease. Many doubts and uncertainties remain about the best therapies for this condition, including antiviral drugs, oxygen therapy, anticoagulation, and antibiotics. Meanwhile, it is vital to consider their side effects and the patient profile for a tailored approach.

Keywords: Coronavirus; Chloroquine; COVID-19; Pandemic; Pneumonia

Introduction

Coronaviruses are a family of RNA virus that affect the lung and can cause serious pulmonary disease. In December 2019, the city of Wuhan, in China, was the center of an upsurge of pneumonias from unknown cause. In January 2020, Chinese scientists isolated a new type of Coronavirus responsible for the new Severe Acute Respiratory Syndrome (SARS-CoV-2) [1]. Epidemiologic investigations emerged after researchers isolated the viral genome in a patient with atypical pneumonia who had visited Wuhan and discovered high genetic similarity with a coronavirus present in bats [2].

Thenceforward, with accelerated transmission between humans, it reached the proportions of a global pandemic within a few weeks. The clinical spectrum of the disease appears to be broad, ranging from asymptomatic and mild respiratory infections to severe viral pneumonia with respiratory failure and death [1]. With a basic reproduction number between 2.5 to 2.9, so far, SARS-CoV-2 has caused more deaths than the yellow fever, MERS, SARS, and Ebola [3; WHO, 2020]. The virus pathophysiology has not been totally clarified, but it is known to activate a cytokine storm, causing an inflammatory cascade. It is expected that the discovery of the immunopathologic pathways will be able to provide targets for future drugs, vaccines and approaches that directly target viral destruction or block the virus from entering the cell [4,5].

To date, the treatment consists of symptomatic relief with antipyretics and analgesics, oxygen and ventilatory support. Many drugs have been tested, however, the only strategy capable of reducing transmission and decreasing mortality is prevention, through contact precaution and strict social isolation [3,4].

This manuscript aims to report the case of a patient with unilateral pneumonia who tested positive for SARS-CoV-2 and responded favorably to Chloroquine and Azithromycin therapy.

Methodology

Information was acquired from the medical records. The data were obtained in April 2020.

Case Presentation

A 56-year-old Caucasian male doctor from Brazil presented with a 7-day history of lumbar back pain spreading to both legs, associated with daily fever (varying from 38.0 to 38.5°C), relived by antipyretics. He had neither significant past medical history nor comorbidities. The symptoms started two days after social contact with a COVID-19 patient, whose diagnosis was later confirmed.

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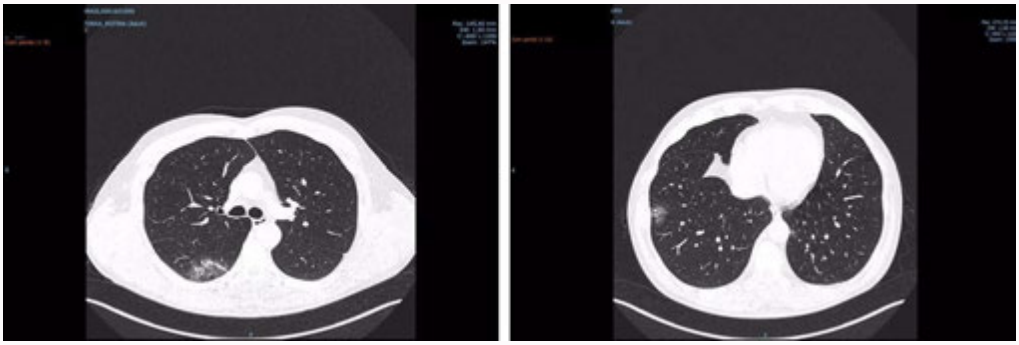

Figure 1: Chest CT done on day 7 of the symptoms, showing peripheral ground-glass opacities in the middle lobe of the right lung.

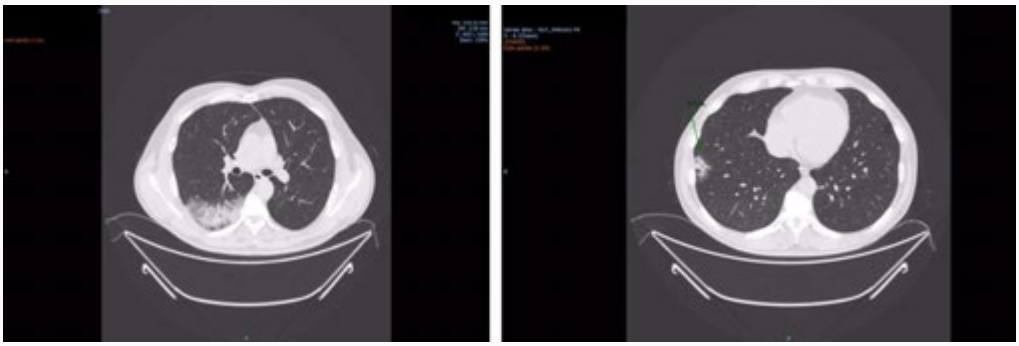

Figure 2: Chest CT done on day 14 of the symptoms, showing consolidation of the previous lesions, with a discrete increase in the affected areas in the middle lobe of the right lung.

On the 7th day of symptoms, he developed myalgia, joint pain, anorexia, fatigue, dysgeusia, and constant colic-type periumbilical pain. He also developed a dry cough which became progressively more frequent. On physical examination, his appearance was unremarkable; he was lucid, eupneic but febrile (38.0°C). Respiratory and abdominal examinations were unremarkable. The patient adopted social isolation at home, performing self-respiratory rate checks and digital oximetry 3 times daily, which showed no abnormalities. On the 7th day, a nasopharyngeal swab was collected to search for the new coronavirus using RT-PCR method, resulting in a positive result. Labs: Leukopenia with normal lymphocyte count, thrombocytopenia (139,000 platelets/μL), elevated creatinine (1.8 mg/dL) and elevated D-dimer (2,600 ng/dL). Imaging tests: Pulmonary angiography detected no abnormalities. Computed Tomography of the chest showed peripheral ground-glass parenchymal lesions in the middle lobe of the right lung (Figure 1). Abdominal computed tomography was performed to assess for mesenteric lymphadenitis, due to abdominal pain, but was normal. He was evaluated by vascular medicine, pulmonology and infectious disease, who opted together for home monitoring, along with treatment with Chloroquine 400 mg twice daily for 8 days and Azithromycin 500 mg once daily for 5 days. D-dimer levels were also monitored, and reached a peak of 3000 ng/dL 5 days later. Two days after starting the medications, he showed significant improvement, with return of appetite and disposition, followed by cough, pain and fever resolution. However, he had severe headaches, nauseas and diarrhea as adverse effects. Despite high D-dimer levels, anticoagulation was not prescribed due to the symptomatic relief. CT scan was repeated on day 14, which showed a slight increase in the affected area, with consolidation of the previous lesions (Figure 2). He completed his treatment regimen and remained in home isolation for another 10 days.

Discussion

This manuscript presents a middle-aged man, without comorbidities. As stated by WHO demographic data, the risk of contracting the disease is higher in people over the age of 60, especially in those with comorbidities. Epidemiological data on gender are limited but show that men have a higher prevalence of comorbidities compared to women, and therefore, account for a slight majority of cases (51%) [6,7].

Regarding disease clinical course, several manifestations have been observed. A Chinese study evaluated 99 patients with COVID-19 pneumonia in Wuhan, with an average age of 55 years. Most patients had fever, cough and dyspnea. Diarrhea, sore throat, rhinorrhea, chest pain and myalgia were less frequently reported [8]. Our patient presented 3 of the symptoms above in addition to abdominal pain, which deserves prominence, since this complaint is not often described in the literature.

With regard to laboratory findings, the most common have been lymphopenia, thrombocytopenia and elevation of the D-dimer, all present in the studied patient [1]. As for lung imaging, Chen et al. described the most frequent findings as being: Bilateral pneumonia (75% of patients), ground-glass opacities and diffuse alveolar infiltrates (14% of cases) [8]. In the present case, its noteworthy that the patient had unilateral involvement, which may account for the favorable outcome.

There are 2 types of laboratory tests to identify the new Coronavirus. The Polymerase Chain Reaction (PCR) detects viral genetic material through material collected from the nasopharynx

and oral mucosa by a swab, and was the test performed on our patient. It should be done within the first week of symptoms. The other diagnostic tool is serology, which detects the presence of IgM (acute phase) and IgG (convalescent phase) antibodies in the blood. It should be assessed 20 days after exposure to confirmed cases, even in the absence of symptoms, and after 7 days for symptomatic patients [9].

The need for urgent solutions has led scientists to consider the efficacy of current drugs, such as chloroquine, antiviral agents such as Remdesivir, and the immunomodulator Interferon-Beta [5]. These medications have a relatively safe profile, affordable prices and availability, prompting its widespread experimental use. Chloroquine antiviral activity seems to be related to inhibition of inflammatory cytokines, inhibiting the cascade of events that lead to acute respiratory distress syndrome [10,11].

The therapeutic approach was decided after joint discussion between specialists, opting for Chloroquine and Azithromycin. The patient showed marked clinical improvement 2 days after taking these drugs. However, the potential for QT interval prolongation and fatal cardiac arrhythmias was taken into account.

Chloroquine has demonstrated antiviral activity *in vitro* against SARS-CoV-2 [12], but the beneficial effect in humans has not yet been proven. A study carried out in Marseille, France, showed viral load reduction in infected individuals. However, the number of participants was small [13]. In addition, no acute viral infections in humans have been successfully treated with this drug before; To conclude, it has failed to show antiviral activity in animal testing [14]. Therefore, any recommendation about it deserves caution.

Considering our patient's high D-dimer level, heparin was also considered. Studies on the pathophysiology of the condition have shown an increased risk of Disseminated Intravascular Coagulation (DIC) and thromboembolism, especially in severe cases. For this reason, heparin has been recommended by some experts [15]. A retrospective cohort evaluated 449 patients at the Tongji hospital in China and concluded that anticoagulant therapy was associated with a better prognosis in patients with severe COVID-19 presentations meeting DIC criteria or with marked elevations of the D-dimer levels (6 times the upper limit of normal) [16]. Another study, also in China, demonstrated the importance of D-dimer as a predictor of in-hospital mortality. After evaluating 343 patients, the results showed that D-dimer levels above 2 mg/ml on admission were associated with higher inpatient mortality [17,18]. For our patient, anticoagulation was ruled out after normal angiography findings and symptomatic relief.

Radiological findings are also important to point out. The patient had unilateral pneumonia in the absence of severe respiratory symptoms. A study conducted by Chinese researchers at a Shanghai Hospital analyzed 51 CT scans of COVID-19 patients. Most of them presented with bilateral multifocal involvement and ground-glass opacities, accounting for 86% of cases. This data provides an overview of the initial radiological findings related to respiratory symptoms at the time of presentation [19]. In a different investigation, Heshui et al. described the radiological findings of 81 patients with COVID-19 pneumonia in Wuhan and concluded that even in cases of asymptomatic pneumonia, there may be tomographic features showing rapid evolution from a focal or unilateral pattern to bilateral involvement and diffuse ground-glass opacities, that seems to progress or coexist with consolidations within 1 to 3 weeks [11].

In order to face this global threat, we must understand that this illness extends beyond health boundaries [20]. Along its trajectory around the world, the virus has overcome health resources in many nations, leaving a trail of deaths, on the top of health, economic, geopolitical and social conflicts. In this context, it is vital to support scientific efforts in the search for an efficient vaccine and treatment, without neglecting current pandemic control measures [21].

Conclusion

This manuscript is a report about a 56-year-old patient without comorbidities, who developed lobar pneumonia caused by COVID-19 and responded favorably to a therapy still under study. Due to his high D-dimer level, prophylactic anticoagulation with heparin was considered, but was not prescribed because of his good recovery, absence of thrombotic risk factors and normal pulmonary angiography findings. It is noteworthy that there is no consensus for the treatment of COVID-19. There should be reservations regarding the indiscriminate use of potential COVID-19 treatments, since studies are still being conducted. Besides uncertainty regarding efficacy, there is also the possibility of serious adverse effects. So far, supportive treatment with hospitalization and intensive care for severe cases are the only reliable options. Besides its economic and psychological repercussions, prevention strategies such as social isolation and quarantine measures are the only effective way to combat this pandemic.

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