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Case Report

HIV-associated Opportunistic Pneumonia Case Mimicking COVID-19 Pneumonia

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ABSTRACT

Cytomegalovirus (CMV) pneumonia is a rare opportunistic infection in the progression of human immunodeficiency virus (HIV) infection. Also, COVID-19 has been named a pandemic since the beginning of 2020. During this period, physicians were exposed to many COVID-19 cases, and it was challenged to consider different diagnoses in patients who applied to the emergency room with lung complaints and bilateral pneumonia. Here we reported a 30-year-old man diagnosed with HIV-associated opportunistic CMV pneumonia mimicking COVID-19. The diagnosis of CMV pneumonia was obtained through consistent clinical, radiological, microbiological and cytologic examinations. The patient made a complete clinical recovery after being initialized on anti-CMV treatment.

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Introduction

COVID-19, an accepted pandemic from March 2020 to date, infected 456 million people and led to the extinction of six million.[1] Typical symptom are fever, chill, cough and dyspnea in COVID-19. Even if some cases have mild illnesses, some patients have a severe acute respiratory deficiency. In diagnosing SARS-CoV-2, PCR, serological tests and thoracic computed tomography (CT) findings are used. Thoracic CT findings of COVID-19 pneumonia have been reported in a wide range of different recent studies. However, thoracic CT findings in all studies are bilateral, subpleural, and peripheral ground-glass opacities, among the early-stage findings of the disease. Ground glass densities are the earliest findings seen in 34-98% of patients in various studies.[2,3]

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Human immunodeficiency virus (HIV)-infected patients' number is approximately 34 million in 2020, according to WHO. Also, 680 thousand people died of HIV-related causes in 2020. Opportunistic pneumonia is the major cause of morbidity and mortality among the pulmonary complications associated with HIV infection. HIV-associated opportunistic pneumonia includes bacterial, mycobacterial, fungal, viral, and parasitic pneumonia. Bacterial pneumonia is frequently seen among opportunistic pneumonia in the United States and Europe. On the other hand, tuberculosis is the predominant pathogen in Africa. Pneumocystis pneumonia (PCP) has lowered associated with the combination of antiretroviral therapy and prophylaxis. Nonetheless, PCP continues to occur in people unaware of their HIV infection, those who fail to access medical care, and those who fail to adhere to antiretroviral therapy or prophylaxis. Even though pneumonia caused by cytomegalovirus (CMV), *Cryptococcus neoformans, Coccidioides immitis, Histoplasma capsulatum,* and *Toxoplasma gondii* are seen less frequently, they cause disseminated disease in the pulmonary system and are related to the higher mortality rate.[4] In HIV infection, clinical and radiographic findings of HIV-related opportunistic pneumonia may overlap, and more than one concurrent pneumonia may be seen in these individuals.[5] This situation makes the diagnosis of CMV pneumonia difficult.[6] We had reached the diagnosis of CMV opportunistic pneumonia for this process. The importance of differential diagnosis of likely opportunistic pneumonia during the pandemic was emphasized.

Case Report

A 30-year-old single Turkish male patient had applied to the COVID-19 unit of the emergency room with symptoms of dyspnea and cough for a week. He seemed tachypneic and uncomfortable. In his first examination, his blood pressure was 110/70 mmHg, his pulse was 102 beats/minute, and his temperature was 36.6 °C. His oxygen saturation was 87% in the room air. In blood tests, only CRP was 22 mg/L (range: 0-10). Complete blood count and biochemistry tests were within normal ranges *(Table 1)*. There was no obvious feature in the chest X-ray. Thoracic CT demonstrated bilateral peripheral ground glass lesions (*Figure 1*). The findings were consistent with viral pneumonia.

Table 1. Biochemistry parameters

Parameters	Results (Day 1)	Results (Day 10)	Results (First Discharge)	Results (Second Arrival)	Range
Urea (mg/dL)	29	20	16	23	16-48
Creatinine (mg/dL)	0.9	0.83	0.85	0.89	0.7-1.2
Sodium (mmol/L)	139	145	142	138	135-145
Potassium (mmol/L)	4.47	5.03	4.95	4.57	3.5-5.1
CRP (mg/L)	22.11	10.03	1.75	8.98	0-10
Ferritin (ng/mL)	588	591	539	349	21-274
D-dimer (mg/L)	0.66	0.73	0.44	-	0-0.5
AST (U/L)	28	32	36	12	2-40
ALT (U/L)	34	32	42	16	2-41
Leukocyte (10^3/mL)	5.54	4.08	3.71	5.54	
Hemoglobin (g/dL)	12	11.07	12.21	12.01	
Platelet (10^3/mL)	323	384	341	323	

CRP: C-reactive protein, AST: aspartate aminotransferase, ALT: alanine aminotransferase.

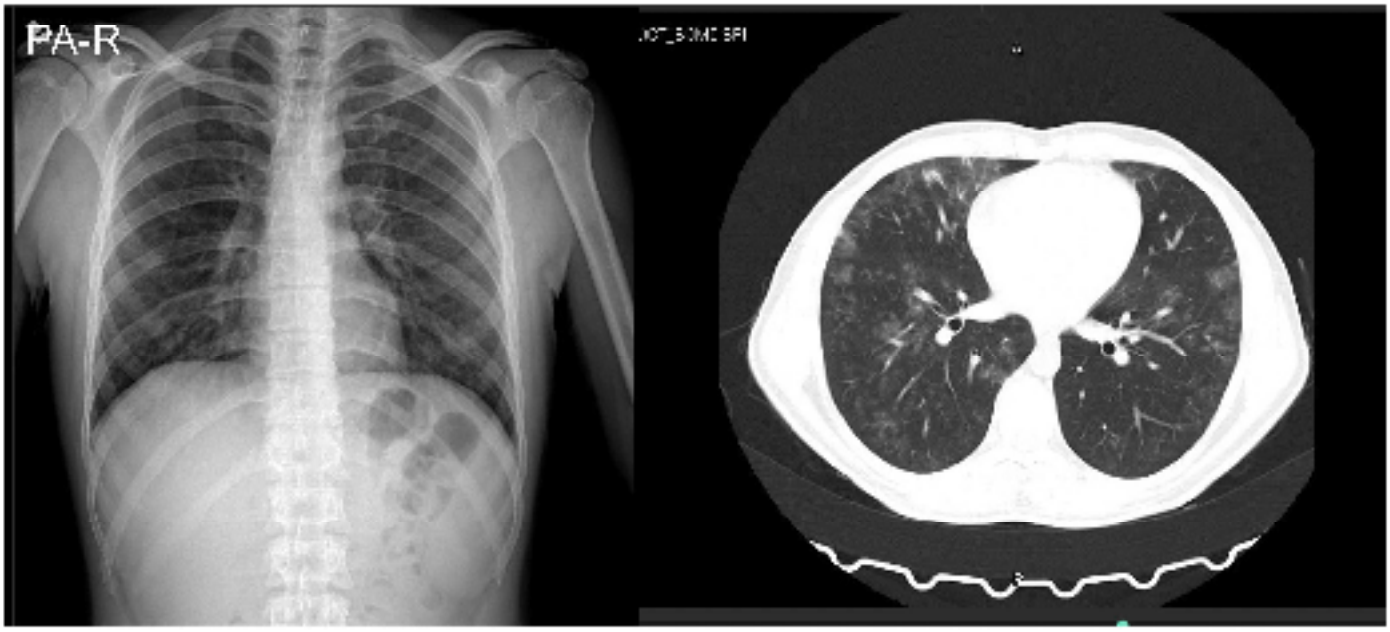

Figure 1. Radiological images

The patient was first diagnosed as having COVID-19 pneumonia due to the pandemic. Combined PCR brush sampling was taken from the oropharynx and nasopharynx for SARS-CoV-2. Then, hydroxychloroquine 400 mg/day and azithromycin 500 mg/day treatments were started for suspected COVID-19 pneumonia. On the second day, the SARS-CoV-2 PCR test resulted as negative. Thus a second PCR test was examined for the patient. At that time, the patient expressed flu-like symptoms; therefore, oseltamivir 150 mg/day was added to the treatment protocol. After the SARS-CoV-2 PCR test was negative on the fourth day, the coronavirus antibody test (IgM+IgG) was performed and it was negative. On the 10th day of hydroxychloroquine treatment, when the CRP value was measured at 25 mg/L, azithromycin was discontinued and moxifloxacin 400 mg/day i.v. was started. Meanwhile, the patient's oxygen saturation was measured at nearly 90% in the room air. We had expected to see decreased CRP and increased oxygen saturation; however, the patient's laboratory findings and physical examination were the same as at the beginning of the treatment period. Although the patient said he felt better, no improvement was observed in the control thorax CT findings. Since our hospital has no microbiology laboratory, we could not perform bacteriological or viral serological tests for non-COVID-19 pneumonia causes. The patient's cardiological examination was unremarkable. Electrocardiogram was in sinus rhythm, and there were no pathological changes. The patient had no history of drugs, alcohol or smoking. When the patient's oxygen saturation lowered to 86-88% in room air, we gave oxygen support with a nasal cannula. Hydroxychloroquine treatment was discontinued. We added favipiravir at a loading dose of 3,200 mg/day and a maintenance dose of 1,200 mg/day to the moxifloxacin treatment. Five days later, the patient's oxygen saturation increased to 94%, dyspnea regressed, and CRP decreased to 1.75 mg/L (*Figure 2*). Afterwards, respiratory symptoms improved and all medications were discontinued on the 15th day, and the patient was discharged.

Fifteen days later, he complained of a dry cough and shortness of breath at the follow-up examination. His vital signs were stable (blood pressure 120/80 mmHg, heart rate 85 beats/minute, body temperature 37 °C). On respiratory system auscultation, rales were found in his lungs. There was no abnormal finding in other system examinations. CRP level was increased. Previous findings on repeated thorax CT persisted. The patient said that he had been treated for oral candidiasis two months ago and that these lesions had recurred. Meanwhile, the patient confessed that he had been using drugs six months ago and had sexual contact with women with suspected HIV, expressing that he could not tell because he hesitated. The anti-HIV test was positive. Given

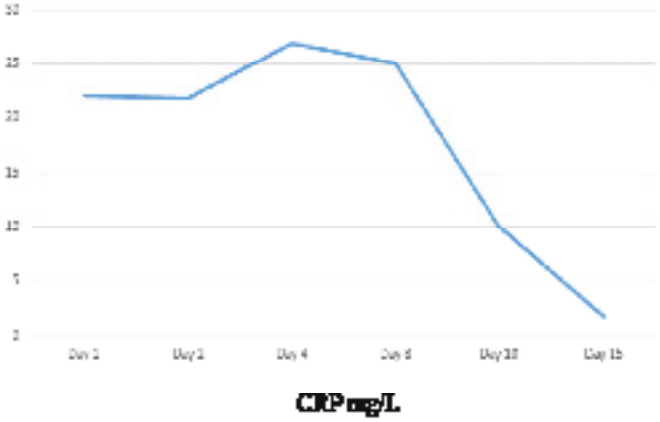

Figure 2. CRP progression

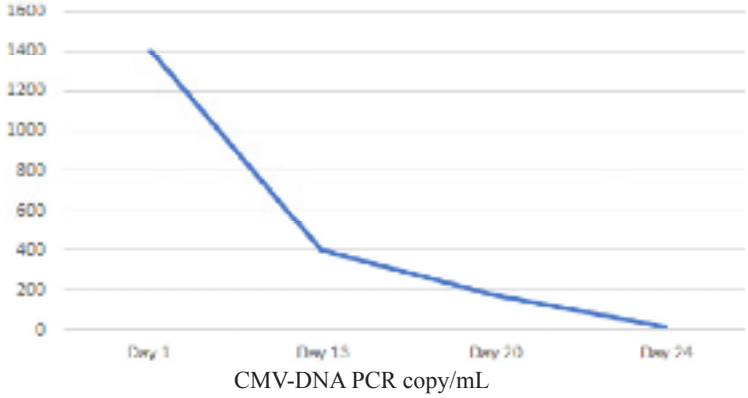

Figure 3. CMV-DNA PCR progression in treatment

the possibility of opportunistic pneumonia in HIV infection, the patient underwent a series of tests in the infectious diseases department. The initial HIV-RNA (PCR) result was 959,336 IU/mL. Serological tests (Toxoplasma IgG, CMV IgG, syphilis IHA and hepatitis) were performed. Sputum culture and microscopy were examined, and normal respiratory tract flora was determined.

In addition, hepatitis markers and syphilis IHA, and toxoplasma IgG-IgM were negative. However, the CMV IgG test was positive. After this positive result, the CMV PCR test was 1,405 copies/mL. The CD4 percentage was 5%, and the absolute CD4 count was 49 cells/µl. Therefore, with the diagnosis of HIV-associated CMV pneumonia, the patient was given antiretroviral therapy and ganciclovir 2x5 mg/kg i.v. started. CMV-DNA results were shown in Figure 3. After starting anti-CMV treatment, the patient's clinical findings improved completely. Thus, he was discharged to come back for control.

Discussion

Burkitt's lymphoma is one of the most ag HIV is a chronic infectious disease that is widespread worldwide and characterized by the suppression of the immune system. The world has been suffering from the 'COVID-19' pandemic since 2020. Because they encountered many COVID-19 patients and almost all pneumonia cases were seen as COVID-19, physicians could not easily consider other pneumonia causes in the differential diagnosis. We started treatment in our patient with the diagnosis of COVID-19 pneumonia, and we insisted on this diagnosis. Unfortunately, the case did not contain any clues for differential diagnosis and withheld critical medical information from us. Even if the patient did not have a coronavirus infection, he responded well to our medical treatment. While coronavirus is an RNA virus, CMV is a DNA virus. Therefore, the mechanisms of medical agents have different stages and targets. We did not consider any effect of antiviral agents such as oseltamivir and favipiravir in this patient on CMV. The patient might have had a secondary bacterial infection at the basement of the CMV infection. At the beginning of the treatment process, we tried to cure the patient with antiviral agents, and no response was obtained in the first week. CRP levels were still high. After adding moxifloxacin, CRP levels dropped, and the patient felt better. This situation indicates that the patient may have some overlapping atypical pneumonia. Such pneumonia can be treated with quinolone antibiotics. It can be thought that the patient has been infected with HIV and has transformed into AIDS. Following these steps, he became infected with CMV, and immunosuppression occurred. Thus, a suitable environment for secondary bacterial infections was created. We treated the secondary bacterial infection with quinolones. In principle, a blood culture could be done, and the microbiological organism could be identified. We selected empiric therapy for pneumonia because he responded well to our treatment.

Conclusions

Eventually, CMV infection is a viral infection that can cause severe clinical events in immunocompromised individuals. Initial suspicion is required for early diagnosis and appropriate treatment in immunocompromised patients. In addition, it should not be forgotten that immunosuppressive conditions such as HIV should be investigated in patients presenting with opportunistic infections.

Conflict of Interests

Authors declare that there is no conflict of interest with regard to this manuscript.

Authors' Contribution

Literature Review, Critical Review, Manuscript preparing held by all authors.

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