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CASE REPORT

Leptospirosis accompanying COVID-19: A case report

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Abstract

The SARS CoV-2 virus, which broke out in Wuhan, China in december 2019 and took over the whole world, was declared as pandemic by the World Health Organization on march 11, 2020. COVID-19 disease caused by this virus, another zoonotic factor in the Coronavirus family, can affect various systems, particularly the respiratory system. Leptospirosis is a zoonotic disease caused by Leptospira. It presents symptoms of fatigue, febrile, and icterus. We aimed to present a case in which the association of SARS CoV-2 with leptospirosis was detected.

Keywords: COVID-19, leptospirosis, pandemic

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Introduction

The SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) virus, which broke out in Wuhan, China in december 2019 and took over the whole world, was declared a pandemic by the World Health Organization on march 11, 2020 (1, 2). COVID-19 disease caused by a zoonotic virus in the Coronavirus family can affect various systems, particularly the respiratory system (3-5). Leptospirosis is a zoonotic disease caused by Leptospira. It presents symptoms of fatigue, febrile, and icterus. Rodents and small mammals occur as reservoirs. Generally, in the monsoon, it is more frequently due to exposure to contamination the dirty water (6). It uses microscopic agglutination test (MAT) and Polymerase Chain Reaction (PCR) frequently in terms of diagnostic of leptospirosis. In some cases, even though cultures can be used, the sensitivity and specificity are low. In clinically and laboratory suspected Leptospirosis cases, MAT, PCR, and rarely serology are used to confirm the diagnosis. The most used method is the MAT test (1, 7).

In COVID-19 diagnosis, PCR has been the gold standard since the pandemic's beginning. Rapid antigen tests and serology can be used in limited cases, but it is not common (8). In clinically and laboratory suspected COVID-19 cases, the Reverse Transcription-Polymerase Chain Reaction (RT-PCR) test, Antigen test, and TrueNat test are used to confirm the diagnosis. The most used method is the RT-PCR test (1).

In this study, we aimed to present a case in which the association of SARS CoV-2 with Leptospira.

Case description

A 57-year-old female patient without any known chronic disease was admitted to our clinic with complaints of fatigue, jaundice, and dizziness that started about a week ago. In her anamnesis, it was found that these complaints affected her social life. Her social background revealed that she lived in a rural area and helped with irrigation works in the field. On the physical examination, there were no pathological findings other than icterus in sclerae. Vital signs were body temperature: 36.5°C, blood pressure: 90/60 mmHg, heart rate: 60/min, respiratory rate: 18/min, and general condition was moderate and conscious during hospitalization. Laboratory tests revealed count as, hemoglobin 10.7 g/dL, thrombocyte 22,400/mm^3, lymphocyte 560/mm^3, C-reactive protein (CRP) 15.2 mg/dl, alanine transaminase (ALT) 217 U/L, aspartate aminotransferase (AST) 70 U/L, total bilirubin 5.9 mg/dl, direct bilirubin 4.2 mg/dl, lactate dehydrogenase (LDH) 70 U/L, creatine kinase (CK) 70 U/L, procalcitonin 1.3 ng/mL (Table 1).

Blood samples for leptospirosis were taken and empiric parenteral ceftriaxone treatment was started at one gram twice a day. According to her lifestyle, she was involved in irrigation work there were patients with similar symptoms around her, and she had clinical and laboratory findings suggesting leptospirosis (8, 9). At the same time, two units of washed platelet suspensions were transfused for correction of thrombocytopenia. As a routine in a pandemic period, a COVID-19 rapid diagnostic test was performed due to the patient's lymphopenia, fatigue complaint, and history of being in crowded environments in the last two weeks, but the result was negative. The first SARS CoV-2 PCR test (combined throat and nose swab) of the patient who underwent a combined throat and nose swab was negative. However, the second PCR test was performed due to the continuation of lymphopenia and was positive. The patient was transferred to the clinic reserved for COVID-19. The blood samples also were investigated in terms of leptospirosis by MAT, and it was positive for 1/800 Leptospira grippotyphosa Moskva V, and antibodies to Leptospira Patoc I at titer 1/800. Thoracic computed tomography of the patient showed peribronchial thickening, micronodular densities, and peripheral ground glass opacity in the upper and lower lobes of both lungs (Figure 1).

Hydroxychloroquine 200 mg twice a day and azithromycin 500 mg on the first day followed by 1x250 mg once per day was added to the patient's current treatment as a continuation (6, 8). On the fifth day of hospital stay, intravenous fluid therapy was started due to increasing levels of creatinine. Hydroxychloroquine and azithromycin treatment was completed in five days

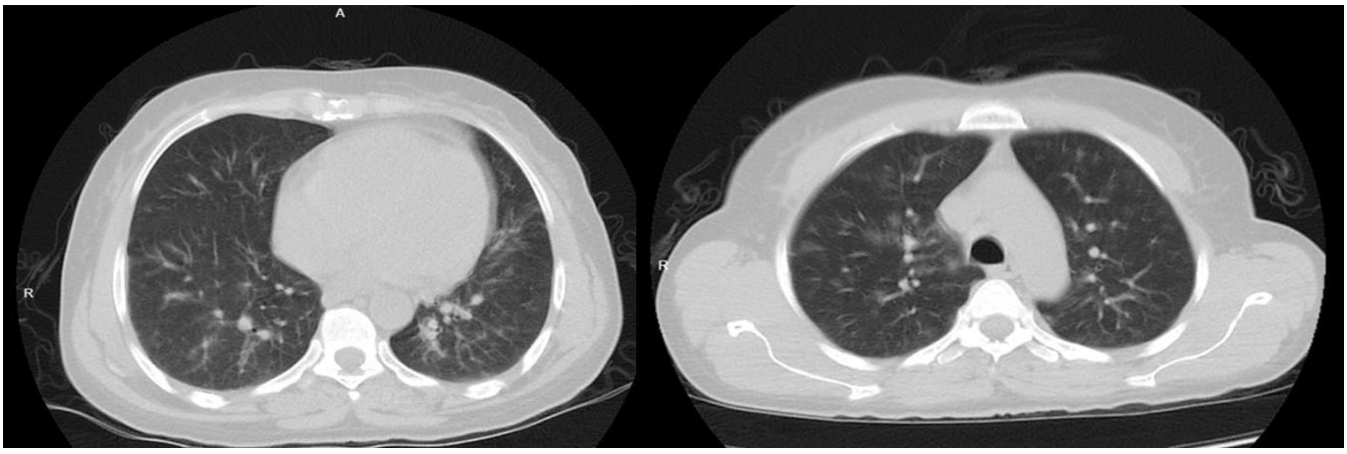

Figure 1: Sections of thorax in computed tomography

Table 1: Laboratory results

Hospitalization day	At admission	1.day	3.day	5.day	7.day	Discharge (10.day)
Leukocytes (/mm^3)	7900	10680	5990	15990	11280	8460
Hemoglobin (g/dL)	10.7	9.7	10.3	11.2	10.6	10.5
Platelet (/mm^3)	22400	52340	72040	120500	146300	149000
Lymphocyte (/mm^3)	560	1260	1580	3690	3010	2520
CRP (mg/dL)	15.2	9.8	2.6	1.8	0.66	0.44
ALT (U/L)	217	187	427	276	158	109
AST (U/L)	70	94	263	63	32	20
Total bilirubin (mg/dL)	5.9	2.9	2.3	1.6	1.1	1.1
Direct bilirubin (mg/dL)	4.2	1.7	1.2	0.6	0.4	0.4
GGT (U/L)	158	138	200	127	121	100
LDH (U/L)	213	198	276	192	191	162
CK (U/L)	128	50	26	15	29	14
Creatinine (U/L)	0.74	0.64	0.66	1.28	0.53	0.45
D-dimer (ng/dL)	2.63	2.04	1.3	1	0.8	0.6
SARS CoV-2 PCR	negative		positive			

and ceftriaxone treatment was completed in seven days and doxycycline 100 mg twice per day oral treatment was started. The patient had clinical and laboratory recovery on the tenth day of her hospitalization and was discharged with home isolation recommendations.

Discussion

Although fever and cough are the most common symptoms of COVID-19, none of them are seen in some cases. In our case, although the patient-matched leptospirosis, clinical and laboratory signs, due to severe fatigue complaint, and lymphopenia, the patient was also screened for possible COVID-19, with positive test results (1, 10, 11). Although clinical presentation is not typical in some cases, it is of great importance to be careful in terms of differential diagnoses, both the treatment of COVID-19 patients and the prevention of social contamination, especially domestic contamination, by providing the isolation of the patients.

COVID-19 pandemic is continuing and since December 2019 approximately 585 million have been infected in addition to 6.4 million death (12). Most of deaths occur over 60 years and with comorbid patients such as hypertension, cancers, cardiovascular disease, etc. Since the beginning of the pandemic, COVID-19 and neglected tropical diseases such as leptospirosis, limited (13). Therefore, we have little information about these co-infections.

There are many reports of leptospirosis during the pandemic time, especially in endemic regions such as Turkey (7, 11). Thus, we must distinguish better to administer treatment and follow-up these two diseases.

Although they are two different diseases, they can be seen clinically and laboratories with similar features. Since leptospirosis is also a bacterial infection, antibiotics are used in its treatment. The most used treatment is ceftriaxone and tetracycline. As of today, there is no effective antiretroviral drug available for COVID-19, which is caused by the SARS CoV-2 virus. The basis of treatment is supportive and anticoagulant (1, 14). Steroids are included in the treatment of both diseases (1, 14). Early diagnosis and early treatment of these patients with similar clinics are crucial.

Conclusions

To conclude, both COVID-19 and leptospirosis may have common symptoms and laboratory findings such as fever, fatigue, and thrombocytopenia. Therefore, should be checked both COVID-19 and leptospirosis when the patients present.

Conflict of interest:

The authors report no conflict of interest.

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No need for case reports. Patient consent was obtained for this case report.

Contributions

Research concept and design: **YD, ÇM**
Data analysis and interpretation: **YD, ÇM**
Collection and/or assembly of data: **YD, ÇM**
Writing the article: **YD, ÇM**
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