

Co-Infection of SARS-CoV-2 Disease and Brucellosis: The First Case Report in Iran

Darya Mofarrahi¹, Zahra Montaseri², Ali Davoodi³

¹ Student Research Committee, Fasa University of Medical Sciences, Fasa, Iran

² Department of Infectious Diseases, School of Medicine, Fasa University of Medical Sciences, Fasa, Iran

³ Noncommunicable Diseases Research Center, Fasa University of Medical Sciences, Fasa, Iran

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Abstract- The novel Coronavirus can cause a vast range of symptoms, among which the most famous is respiratory system complications. Brucellosis is a highly contagious zoonotic disease, especially in endemic areas such as Iran. The disease, initially revealed with nonspecific symptoms, shows similar manifestations to SARS-CoV-2 disease. A 37-year-old woman presented with severe pain and swelling of the right inguinal area a week after working in a garden. Brucellosis treatment was initiated, and the patient was transferred to the COVID ward and received COVID medical therapy. The patient's pain reduced, and she was discharged and informed of the warning signs or any condition change. Owing to the high prevalence of COVID-19, other infectious diseases may be neglected. This case is a reminder to clinicians that the co-infection of SARS-CoV-2 and other diseases such as brucellosis may occur and differential diagnoses should be considered, especially for endemic diseases.

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Introduction

Brucellosis is one of the most important zoonotic diseases that are highly contagious. It can be transmitted through unpasteurized dairy, undercooked meat from infected animals, or close contact with their secretions (1). The disease is presented with a wide range of symptoms, such as undulant fever, sweating, and musculoskeletal pain. Gastrointestinal symptoms such as nausea, vomiting, constipation, diarrhea, and even weight loss are also very common. A highly pathognomonic finding of this disease is osteomyelitis and spondylodiscitis, along with sacroiliitis (2).

The novel SARS-CoV-2 virus can cause a vast range of symptoms. It can be manifested with respiratory or gastrointestinal symptoms. It starts with influenza-like symptoms like chills, fever, fatigue, myalgia, and mild upper respiratory tract infection, followed by lower respiratory tract infection causing cough, rhinorrhea, and

dyspnea. In the gastrointestinal form, nausea, vomiting, and diarrhea are usually present (3,4). As some symptoms are similar in both diseases, clinicians may be misled in brucellosis diagnosis.

In this study, we reported the co-infection of COVID-19 and brucellosis in a young woman, the first report from Iran. To the best of our knowledge, there have been two reports of the same co-infection.

Case Report

In January 2022, a 37-year-old woman without any history of previous admission was referred to the emergency room of Fasa hospital, located in southwest Iran, with a complaint of severe pain and swelling of the right inguinal area. She had a history of working in a garden a week before representing the symptoms. She had no history of recent contact with animals or using unpasteurized dairy products. In physical examination,

Corresponding Author: Z. Montaseri

Department of Infectious Diseases, School of Medicine, Fasa University of Medical Sciences, Fasa, Iran
Tel: +98 7153314068, Fax: +98 7461686688, E-mail address: montaserizahra90@gmail.com

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she only had tenderness and swelling on the right side of the inguinal and sacroiliac area. No sign of hyperemia nor warmth was found in this area. Fever and chills were not also documented. The hip X-ray imaging was normal. Hematology tests -which are documented below- were all in the normal ranges except for the C-reactive protein

(CRP) (86 mg/L) and erythrocyte sedimentation rate (ESR) (30 mm/hr) that showed a high acute inflammation. Liver and renal function tests were normal. The only abnormal findings in the serum test were elevating (Table 1).

Table 1. Hematology result of the defined case

Hematology test (unit)		Result (normal range)
WBC count (10 ³ /μL)	8	(3.5-10)
RBC count (10 ³ /μL)	4.2	3.8-4.8
Hb (g/dL)	11.7	(11-16)
MCV (fL)	85.8	(76-96)
MCH (mg/dL)	28.2	(27-32)
MCHC (g/dL)	32.9	(32-36)
Plt (10 ³ /μL)	353	(150-450)
Lymph (%)	19	
Neutrophil (%)	78.3	
MXD (%)	8.1	
CRP (mg/L)	86	<6
ESR (mm/h)	30	≤ 20

The right sacroiliac joint under the ultrasound showed low fluid, which was not enough to tap.

The case was also consulted with the infectious specialist, who ordered a COVID-19 test along with a chest X-ray and a brucellosis test. For the COVID-19 test, the nasopharyngeal swab was carefully sampled and transferred to the genetic laboratory unit, where RNA extraction and real-time PCR (RT-PCR) were carried out. RNA extraction was performed using AmpliSens® kit (RIBO-Prep, Russia), and the RT-PCR was completed using CAPITAL™ qRT-PCR Probe Mix (Biotechrrabbit, Hennigsdorf, Germany) using the StepOnePlus™ RT-PCR System (Applied Biosystems, Foster City, California, USA). For brucellosis diagnosis, the Wright and 2-mercaptoethanol (2-ME) tests were checked.

The result of RT-PCR showed COVID-19 positive. The Wright and 2-mercaptoethanol (2-ME) tests were respectively found at 1:80 and 1:40 titers, implicating brucellosis diagnosis.

Therefore, the brucellosis treatment was initiated, and the patient was transferred to the COVID ward and received COVID medical therapy.

Discussion

In this study, we reported a young woman patient presented with right inguinal and hip pain, tenderness, and limping, which are symptoms of brucellosis (2). Since the world is currently threatened by COVID-19 disease, a large number of patients referring to hospitals

with flu-like symptoms may be misdiagnosed with COVID-19, so other diseases, especially infectious diseases, may be neglected (2,5). Some diseases, such as brucellosis, have increased during the SARS-CoV-2 pandemic (6), mainly due to various factors; fear of COVID-19 is one of the reasons for postponing patients to visit doctors. Another possible reason is owing to the high rate of COVID-19 patients; many patients may be diagnosed with COVID-19 before performing additional and appropriate workups (2,5).

Brucellosis, an endemic zoonotic disease in Iran, may affect multiple organs of the body and involve a wide range of symptoms, such as undulant fever, sweating, and musculoskeletal pain. Gastrointestinal symptoms such as nausea, vomiting, constipation, diarrhea, and even weight loss are also very common (7,8). Furthermore, osteomyelitis and spondylodiscitis, along with sacroiliitis, are pathognomonic findings relevant to brucellosis (8), the chief complaints of the case in our study. The disease can be transmitted by the consumption of unpasteurized dairy, undercooked meat from infected animals, or close contact with their secretions (9). It seems that the route of infection in our patient was the inhalation of infected aerosols from the fertilizer in the garden, according to her history.

There are a few case reports of the co-infections of COVID-19 and brucellosis (2). Although brucellosis may not be diagnosed in COVID-19 patients, due to similar initial symptoms, in COVID-19 disease, respiratory involvement, rhinorrhea, sore throat, diarrhea, nausea,

loss of taste, and anosmia are more frequent, while drenching sweating along with relative lymphocytosis is a usual finding in brucellosis.

Therefore, patients with COVID-19 symptoms should be differentiated from other diseases having similar symptoms. During the COVID-19 disease pandemic, other hazardous diseases, especially those categorized as endemic, should not be neglected. Precise history, physical exams, and workups are also extremely helpful in diagnosis. Furthermore, comprehensive control programs should be executed to inform people living in endemic areas to prevent brucellosis.

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