Case report

COVID-19 co-infection in a patient with brucella bacteremia

Fatehi Elzein *, Nisreen Alsherbeeni, Kholoud Almatrafi, Diaa Shosha, Kaabia Naoufel

Infectious Diseases Unit, Prince Sultan Military Medical City (PSMMC), Riyadh, Saudi Arabia

A B S T R A C T

We discuss a patient who presented with fever, chills and rigors, myalgia, sore throat, diarrhea, and abdominal pain. The total white blood cell count was normal. The lymphocyte and platelet counts were within normal limits. There was no contact with confirmed COVID-19 patient, but the disease was circulating at the time of presentation. He admitted to anosmia and hypogeusia. A nasopharyngeal swab r-RT PCR test was positive for the SARS-CoV-2 virus. His chest examination and chest x-ray were normal. The patient had contact with animals and consumed unpasteurized camel milk. Both the blood culture and brucella serology tests were positive.

This case illustrates that co-infection can occur and it is important to rule out endemic diseases in patients with COVID-19. Similarly, patients presenting with febrile endemic diseases may be harboring mild SARS-COV-2 virus infections and may need to be screened when the disease is suggested by epidemiological exposure.

1. Background

COVID-19 was first described, following a series of pneumonia cases of unknown cause that emerged in Wuhan, Hubei, China in December 2019. The disease is caused by a bat virus like previous SARS so the name SARS-COV 2 [1]. Although the initial infection was zoonotic following exposure to animals in Huanan seafood market, the virus spilled over leading to human-to human transmission with a very high infectivity rate though lower mortality than SARS and MERS –CoV infection. Most of the infections are mild or asymptomatic (81%) with severe disease occurring in 14% of the patients. Critical illness requiring ICU admission is seen in 5% of the cases [1,2]. Severe and critical diseases are related to age, comorbid illness including hypertension, diabetes mellitus, obesity, cardiac and chronic respiratory diseases. The diagnosis is best established by nasopharyngeal swab for reverse transcriptase polymerase chain reaction (RT-PCR) assay while lower respiratory tract specimen can be tested in intubated patients. False negative tests can reach up to 33% following a single test [3]. Of note, a negative initial test in epidemiologically suspected patient does not exclude the diagnosis and should be repeated. At present, there is no established treatment for COVID-19 and drugs should be prescribed within on-going clinical trials.

2. Case report

A 41-year-old- man presented to clinic on March 08, 2020 with back pain, fever and dysuria. He was prescribed oral cefuroxime 500mg twice daily and paracetamol tablets. One week later he presented with extreme fatigue but no fever. The white cell count (WBC) was 5.810^9/L, lymphocytes were normal at 2.310^9/L, and hemoglobin was 12.3 g/dL. Renal, hepatic function and ferritin were normal. On the March 18, 2020 he attended the emergency department with a history of fever, chest pain, worsening fatigue, sore throat, runny nose, muscle and joint pain and diarrhea. He also complained of anorexia and loss of taste. The WBC was 5.6 × 10^9/L, hemoglobin 12.2 g/dL, lymphocytes 3.2 × 10^9/L, CRP 42 mg/L (NR 0–6 mg/L) and ESR 72 mm/hr. Serum ferritin was 271ng/mL (NR 30–400 ng/mL). Viral screening for influenza A and B and Middle East respiratory syndrome (MERS-CoV) was negative. There was no contact with a COVID-19 patient however the nasopharyngeal swab test of SARS-CoV-2 by qualitative real-time reverse-transcriptase-polymerase-chain-reaction (rRT-PCR) assay turned positive. The chest x-ray on admission was normal with clear lung fields. He was isolated in hospital for 3 days and then for 11 days in an isolation facility. Retesting for SARS-COV-2 RNA on the fourteenth day was repeatedly negative. Two days following discontinuation of isolation he presented to the primary care clinic with high grade fever associated with chills and rigors and drenching sweating. In addition, he complained of nausea and abdominal pain. The temperature was 39 °C, PR 120/min while the rest of the examination was normal. Investigation showed serum creatinine 108 μmol/L (NR 59–104μmol/L), serum bilirubin 8, alanine transaminase 43 (NR5-41IU/L) and gamma GT 147 (NR6-11 IU/L). ESR 34 and CRP 34. WBC 5.2 with lymphocytes count 2.9. A blood culture collected at the time of admission with COVID-19 grew brucella species sensitive to standard anti-brucella treatment.
further questioning he admitted to history of raw camel milk ingestion and strong animal contact two weeks prior to his illness. Both the camels and the farm attendants were asymptomatic. A follow up serology showed a brucella titre of 1:10240. He was started on combination of doxycycline 100mg BID and rifampicin 600mg once daily. His symptoms improved on his combination treatment and CRP dropped to 17.

3. Discussion

On March 2, 2020, the Saudi Arabian Ministry of Health confirmed the first case of the COVID-19 disease caused by the SARS-CoV-2 virus in the kingdom.

Our patient presented with symptoms that were suggestive of both brucellosis and COVID-19 disease, including high-grade fever, chills and rigors, fatigue, myalgia, and joint pains. However, a history of rhinorhea, sore throat, diarrhea, and extreme fatigue are more commonly reported with COVID-19. In contrast, respiratory involvement in brucellosis is infrequent and is mainly described in case reports [4]. Furthermore, diarrhea is more common in SARS-CoV-2 infections, whereas drenching sweating is typical for brucellosis [5]. In a report of 1,482 hospitalized patients with confirmed COVID-19 in the United States, diarrhea and nausea were reported in 27% and 24% of patients, respectively [6]. In addition, our case presented with a loss of taste, which is more peculiar to SARS-CoV-2 and not usually reported in brucellosis. In a multicenter European study of 417 patients with mild to moderate illness, 86% of the patients reported olfactory dysfunction (most patients reported anosmia without nasal obstruction or rhinorhea) and 88% of patients reported gustatory dysfunction [7]. Smell and/or taste disorder can be the initial manifestation of COVID-19 in 35.5% of the patients. The CDC recently added a new loss of taste or smell to the features of possible COVID-19 symptoms.

Unusual to COVID-19 is the persistent lack of lymphopenia. Lymphopenia was detected in 35.3–82.1% of confirmed COVID-19 patients [1], but in contrast, relative lymphocytosis is a common finding in brucellosis [9]. This patient’s history of contact with animals and consumption of unpasteurized camel milk were strong clues toward a diagnosis of brucellosis. Regrettably, we did not look for SARS-COV-2 in the camel. Only a few reports identified any infection of animals and pets with SARS-CoV-2 [10]. Notably, camels are recognized intermediates hosts for MERS-CoV infection, whereas civets are known in virology as the initial intermediate hosts for SARS-CoV infection and should exclude this diagnosis, especially in patients with a history of contact with animals and contact with animals and pets infected with SARS-CoV-2 [11]. Importantly, the presence of other pathogens, particularly respiratory viruses, should not be taken as evidence that a patient does not also harbor a SARS-CoV-2 coinfection [16]. To the best of our knowledge, this is the first report of a patient with a history of contact with animals and contact with animals and pets infected with SARS-CoV-2 [11].

High rates of coinfection between SARS-CoV-2 and other respiratory pathogens has been described, including influenza, legionnaire disease, dengue virus, and mycoplasma pneumonia [12–15]. Importantly, the presence of other pathogens, particularly respiratory viruses, should not be taken as evidence that a patient does not also harbor a SARS-CoV-2 coinfection [16]. To the best of our knowledge, this is the first report of a patient with a history of contact with animals and contact with animals and pets infected with SARS-CoV-2 [11].

It is expected that COVID-19 may obscure or mimic other febrile illness in endemic areas. The presence of SARS-COV may not be taken as an indication of the absence of other infections when the presentation is atypical, or the history suggests an alternative or additional diagnosis. “COVID-19 mimic” has been described where an elderly patient admitted with a fall tested positive for SARS-CoV-2, while another patient was referred to the ER as a COVID-19 patient and found to have CHF. The test for SARS-COV-2 was repeatedly negative in this patient [17].

In conclusion, physicians should have a high index of suspicion for SARS-COV infection and should exclude this diagnosis, especially in admitted patients. This is crucial to interrupt the transmission cycle of this virus. Similarly, other endemic diseases should not be overlooked in COVID-19 patients since SARS-CoV-2 might be a bystander and many of these patients could be asymptomatic.

Funding
None.

Consent
Consent is obtained.

Author contribution
F Elzein wrote the manuscript and followed the patient. N Alsherbeeni followed the patient and critically reviewed the manuscript, Kaabia. Kholoud Almatrafi and Diaa Shosha collected information from the patient and followed the lab results. Both critically reviewed the manuscript.

Declaration of competing interest
None.

References
[1] C. Huang, Y. Wang, X. Li, L. Ren, J. Zhao, Y. Hu, et al., Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China, Lancet 395 (2020) 497–506, https://doi.org/10.1016/S0140-6736(20)30183-5.
[2] Z. Wu, J.M. McGoggan, Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China, J. Am. Med. Assoc. (2020), https://doi.org/10.1001/jama.2020.2648.
[3] P. Wikramaratna, R.S. Paton, M. Ghasarti, J. Lourenco, Estimating false-negative detection rate of SARS-CoV-2 by RT-PCR, MedRxiv (2020), https://doi.org/10.1101/2020.04.05.20053355.
[4] G. Pappas, M. Bosilkovski, N. Akritidis, M. Mastora, L. Krteva, E. Tsianos, Brucellosis and the respiratory system, Clin. Infect. Dis. (2003), https://doi.org/10.1086/379125.
[5] J. Ablin, D. Mevorach, R. Eliaikim, Brucellosis and the gastrointestinal tract: the odd couple, J. Clin. Gastroenterol. (1997), https://doi.org/10.1097/00004836-199701000-00005.
[6] L.C.D. Covid-net, Hospitalization rates and characteristics of patients hospitalized with 69 (2020) 458–464.
[7] J.R. Lechien, C.M. Chiesa-Estomba, D.R. De Saiati, M. Horoi, S.D. Le Bon, A. Rodriguez, et al., Olfactory and gustatory dysfunctions as a clinical presentation of mild-to-moderate forms of the coronavirus disease (COVID-19): a multicenter European study, Eur. Arch. Oto-Rhino-Laryngol. (2020), https://doi.org/10.1007/s00405-020-09565-1.
[8] Á. Beltrán-Corbellini, J.L. Chico-García, J. Martínez-Poles, F. Rodríguez-Jorge, E. Natera-Villalba, J. Gómez-Corral, A. Gómez-Lopez, E. Monreal, P. Parris-Díaz, J. L. Cortés-Cuevas, J.C. Galán, Acute-onset smell and taste disorders in the context of COVID-19: a pilot multicentre polymerase chain reaction based case-control study, European journal of neurology (2020 Apr 22).
[9] G. Pappas, Brucellosis, Hunter’s Trop. Med. Emerg. Infect. Dis. Ninth Ed. (2012), https://doi.org/10.1007/978-1-4614-4930-4-00070-9.
[10] N.M.A. Parry, COVID-19 and pets: when pandemic meets panic, Forensic Sci Int Rep (2020), https://doi.org/10.1016/j.jsfr.2010.0909.
[11] L.-W. Ye, S. Yuan, K.-S. Yuen, S.-Y. Fang, C.-P. Chan, D.-Y. Yin, Zoonotic origins of human coronaviruses, Int. J. Biol. Sci. (2020), https://doi.org/10.7150/ijbs.45472.
[12] C.E. Fan, K.G.E. Lim, V.C.L. Chong, S.S.W. Chan, K.H. Ong, P. Kuperan, COVID-19 and mycoplasma pneumoniae coinfection, Am. J. Hematol. (2020), https://doi.org/10.1002/ajh.25785.
[13] M. Saavedra-Velasco, C. Chiara-Chilet, R. Pichardo-Rodriguez, A. Grandez-Urbina, F. Inga-Berrosopi, Coinfection between dengue and covid-19: need for approach in endemic zones, Rev. Fac. Cienc. Med. Univ. Nac Cordoba (2020), https://doi.org/10.21053/1853.0605.v77.n1.28601.
[14] X. Wu, Y. Cai, X. Huang, X. Yu, L. Zhao, F. Wang, et al., Co-infection with SARS-CoV-2 and influenza A virus in patient with pneumonia, China, Emerg. Infect. Dis. (2020), https://doi.org/10.3201/eid2606.200299.
[15] S. Richardson, J.S. Hirsch, M. Narasingham, J.M. Crawford, T. McGinn, K. W. Davidson, et al., Presenting characteristics, comorbidities, and outcomes among 57,000 patients hospitalized with COVID-19 in the New York city area, Jama 10022 (2020) 1–8, https://doi.org/10.1001/jama.2020.6775.
[16] D. Kim, J. Quinn, B. Pinsky, N.H. Shah, I. Brown, Rates of co-infection between SARS-CoV-2 and other respiratory pathogens, Jama 92 (2020), https://doi.org/10.1001/jama.2020.6266.
[17] C.H. Nickel, R. Binggins, Mimics and chameleons of COVID-19, Swiss Med. Wkly. (2020), https://doi.org/10.4414/smw.2020.20231.