

# A Unique Presentation of Delirium in a Patient with Otherwise Asymptomatic COVID-19

Walid A. Alkeridy, MBBS, MSc, \*††  Ibrahim Almaghlouth, MBBS, MSc, \*‡†  
Rashed Alrashed, MBBS, \* Khalid Alayed, MBBS, \* Khalifa Binkhamis, MBBS, §  
Aynaa Alsharidi, MBBS, \* and Teresa Liu-Ambrose, PT, PhD<sup>¶||†</sup>

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**OBJECTIVE:** Infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes coronavirus disease 2019 (COVID-19), manifests with a wide spectrum of presentations. Most reports of COVID-19 highlight fever and upper respiratory symptoms as the dominant initial presentations, consistent with the World Health Organization guidelines regarding suspected SARS-CoV-2 infection. However, atypical presentations of this disease have been evolving since the initial outbreak of the pandemic in December 2019. We report a case of an older male patient who presented at our hospital with an unusual manifestation of COVID-19.

**DESIGN:** Brief report.

**SETTING:** A university hospital in Saudi Arabia.

**PARTICIPANT:** A 73-year-old man who presented with confusion in the absence of any respiratory symptoms or fever.

**INTERVENTION:** The patient was initially admitted with delirium and underwent a further work-up.

**MEASUREMENTS:** Given his recent history of domestic travel and the declaration of a global COVID-19 pandemic status, the patient was administered a swab test for SARS-CoV-2.

**RESULTS:** The patient's positive test led to a diagnosis of COVID-19. Although he began to experience a spiking fever and mild upper respiratory symptoms, he recovered rapidly with no residual sequela.

**CONCLUSION:** The recognition of atypical presentations of COVID-19 infection, such as delirium, is critical to the timely diagnosis, provision of appropriate care, and avoidance of outbreaks within healthcare facilities during this pandemic. *J Am Geriatr Soc* 68:1382-1384, 2020.

**Keywords:** COVID-19; delirium; fall; atypical; outbreak

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From the \*Department of Medicine, King Saud University, Riyadh, Saudi Arabia; †Geriatric Division, Department of Medicine, University of British Columbia, Vancouver, Canada; ‡College of Medicine Research Center, King Saud University, Riyadh, Saudi Arabia; §Department of Pathology, College of Medicine, King Saud University, Riyadh, Saudi Arabia; ¶Department of Physical Therapy, Aging, Mobility, and Cognitive Neuroscience Laboratory, Faculty of Medicine, University of British Columbia, Vancouver, Canada; and the ||Center for Hip Health and Mobility, Vancouver Coastal Health Research Institute, University of British Columbia, Vancouver, Canada.

Address correspondence to Walid A. Alkeridy, Department of Medicine, King Saud University, West College of Medicine Building, 3rd floor, Riyadh 12372, Saudi Arabia. E-mail: walkeridy@ksu.edu.sa

†Walid A. Alkeridy and Ibrahim Almaghlouth contributed equally to this manuscript and are co-first authors.

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Since the initial outbreak in December 2019, coronavirus disease 2019 (COVID-19) has spread widely and rapidly throughout the world.<sup>1</sup> Several features of this disease, which is caused by infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), have elicited significant fear among the public. One such feature involves the ability of COVID-19 to spread rapidly within communities with various degrees of virulence,<sup>2</sup> although unfortunately this feature is not restricted to SARS-CoV-2 but is also common among less virulent respiratory viruses.<sup>3</sup> Therefore, it is crucial for healthcare systems to implement dynamic policies related to the testing of COVID-19 in the face of the current public health emergency.<sup>4</sup>

Currently, most public health measures to control the spread of COVID-19 rely heavily on the identification of individuals with the highest probability of COVID-19. To identify such individuals, the World Health Organization (WHO) developed case definitions for testing<sup>5</sup> that rely on both the presence of classical symptoms and the epidemiological risk.<sup>2,5</sup> However, these definitions do not capture infected individuals with atypical presentations.<sup>5</sup> Failing to identify all infected individuals within a healthcare facility increases the risk of virus transmission within the facility and places both

healthcare workers and other patients at risk of infection.<sup>6</sup> In addition, the failure to diagnose COVID-19 properly hinders the provision of appropriate care. In this report, we describe our experience with COVID-19 in a patient with an atypical presentation of confusion in the absence of any upper respiratory or constitutional symptoms. Additionally, we present the results of a systematic search for cases of COVID-19 involving an initial central nervous system (CNS) presentation.

## CASE REPORT

A 73-year-old male patient with acute confusion was discovered at home on the floor after a fall and was transferred by ambulance to the emergency department (ED) of a hospital in Saudi Arabia on March 20, 2020. He had no history of headache, visual changes, or involuntary movement. Additionally, he had no history of fever, shortness of breath, sore throat, or gastrointestinal symptoms. He complained of chronic urinary incontinence, and his medical history included type 2 diabetes mellitus, essential hypertension, and ischemic heart disease, for which he had undergone a percutaneous coronary intervention 6 years earlier. He did not report any recent contact with sick people or patients diagnosed with COVID-19. He reported a history of travel by plane from Jeddah city 10 days earlier.

Upon arrival in the ED, he was conscious, alert, and oriented to the time and place but not to other people. An analysis of his vital signs revealed an elevated blood pressure of 170/60 mm Hg, heart rate of 80 beats/minute, respiratory rate of 20, stable oxygen saturation of 97% on room air, and oral temperature of 36.6°C. His cranial nerves were intact, and he did not exhibit neck stiffness or photophobia. Brudzinski and Kernig's signs and other indicators of possible meningitis were negative. A motor examination revealed bilateral lower limb weakness that was more pronounced on the right side (4/5 on the right side, 4+/5 on the left side) but no weakness in the upper limbs. He reported reduced sensation in both distal lower limbs, with more significant effects on the right side. Proprioception in both lower limbs was impaired. His flexor plantar response was normal. The findings of cardiovascular and abdominal examinations were unremarkable. A chest examination revealed mild expiratory wheezing in the right middle zone. Table 1 shows the results of a blood analysis. The working diagnosis initially was an acute stroke or transient ischemic attack. However, a plain computed tomography scan of the brain did not indicate an acute insult, and an angiogram of the circle of Willis revealed patent anterior and posterior arteries. He was initially managed as a case of delirium and rhabdomyolysis.

Twenty-four hours later, the patient newly developed a fever of 38.6°C. Given his recent history of travel, a nasopharyngeal and oropharyngeal COVID-19 reverse transcription polymerase chain reaction (RT-PCR) screening test was requested, and this yielded positive results (PCR cycle threshold [Ct] = 16.7). He was transferred from a common room to an airborne isolation room and closely monitored. Unfortunately, the patient refused a lumbar puncture to test for CNS involvement of COVID-19. Forty-eight hours after his initial presentation, he developed a cough that produced a whitish sputum but had no other active respiratory symptoms and never required oxygen

**Table 1. Results of Blood Analyses throughout the Course of Hospitalization for COVID-19**

Panel	At presentation	48 hours	Day 8
White blood cells × 10 <sup>9</sup> /L	6.960	3.400	4.200
Hemoglobin, g/L	110	105	108
Platelets × 10 <sup>9</sup> /L	195.4	153.0	167.0
Neutrophils × 10 <sup>9</sup> /L	2.6	1.9	2.3
Lymphocytes × 10 <sup>9</sup> /L	0.7	0.9	1.1
Monocytes × 10 <sup>9</sup> /L	0.6	0.6	0.4
D-dimer, µg/mL	0.4	...	...
Sodium, mmol/L	134	136	136
Potassium, mmol/L	4.3	4.4	4.7
Bicarbonate, mmol/L	27	24	24
Chloride, mmol/L	97	101	105
Corrected calcium, mmol/L	2.32	2.22	2.25
Magnesium, mmol/L	0.60	0.83	...
Phosphorus, mmol/L	1.07	1.4	1.02
Creatinine, mmol/L	70	62	66
Blood urea nitrogen, mmol/L	3.8	3.6	4.1
Creatinine kinase, unit/L	2,311	2,709	141
High-sensitivity troponin, ng/L	18	...	5.30
Brain natriuretic peptide, pg/mL	190	...	...
Alanine aminotransferase, unit/L	73	79.0	55.0
Aspartate aminotransferase, unit/L	125	145	32
γ-Glutamyltransferase, unit/L	49	53	60
Bilirubin direct µmol/L	3.72	4.92	5.40
Bilirubin indirect µmol/L	10	6	2
Alkaline phosphatase, unit/L	95	77	80
Albumin, g/L	37.8	32.65	33.68
C-reactive protein, mg/L	7.2	—	—
Procalcitonin, ng/mL	0.120	—	—
Antinuclear antibody titer	1:80	—	—
Prothrombin time/s	14	—	—
Activated partial thromboplastin time/s	34	—	—
International normalized ratio/s	1.05	—	—

therapy. A chest radiograph revealed diffuse bilateral interstitial lung infiltrates. He was then administered a 10-day course of oral hydroxychloroquine therapy at a dose of 200 mg every 8 hours, as well as a 7-day course of intravenous piperacillin/tazobactam at a dose of 1 g every 8 hours as a treatment for both aspiration pneumonia and hospital-acquired pneumonia. A septic blood screen and urine culture were negative. He responded very well to both antimicrobial therapies, and his clinical signs and symptoms had resolved completely by day 8 of hospitalization. He remained in the isolation ward, and repeated COVID-19 RT-PCR tests at days 4, 7, 10, and 13 remained positive, with Ct values of 23.5, 25.3, 27, and 32.5, respectively.

## DISCUSSION

Although fever and respiratory symptoms are typical hallmarks of COVID-19 infection, other acute signs and symptoms should not be ignored during this pandemic. The patient described in this report highlights an atypical host

response to SARS-CoV-2 because falls and delirium are not included in the current suspected COVID-19 case definition criteria,<sup>5</sup> although other reports have described CNS complications of SARS-CoV-2 infection.<sup>7,8</sup> For example, Zhou et al presented the first evidence that SARS-CoV-2 could directly invade the nervous system in a report of a patient with SARS-CoV-2 encephalitis.<sup>9</sup> However, that report did not describe whether the patient's initial presentation involved respiratory or neurologic symptoms.<sup>9</sup>

Healthcare systems that permit COVID-19 testing only when the WHO definition of a suspected case is fulfilled will miss atypically symptomatic cases.<sup>5</sup> Our patient did not fulfill the criteria for COVID-19 infection at the time of presentation, and our hospital policy only permitted a COVID-19 RT-PCR test on the day after admission when the patient developed a fever.<sup>5</sup> This restrictive testing policy of testing only suspected patients who fulfill the WHO criteria exposed our healthcare workers in the ED, radiology department, and medical floor and the other patients in the shared hospital room to COVID-19 before our patient was appropriately isolated. This case led to a 3-day suspension of clinical services at the ambulatory clinics to ensure the completion of contact tracing. Additionally, new infection control measures and policies were issued to limit the number of healthcare workers who examined new patients and to mandate the use of full personal protective equipment when examining any new patient.

Although falls and delirium are considered atypical presentations of COVID-19,<sup>5</sup> these events are common in older adults with multiple comorbidities.<sup>10</sup> During the previous SARS epidemic, which originated in China in 2003,<sup>11</sup> the WHO also developed guidelines for possible cases that included fever as a prerequisite for the case definition of a "possible case of SARS."<sup>11</sup> However, several reports described cases of confirmed SARS-CoV infection in older adults who had initially presented without fever.<sup>12</sup> At that time, SARS testing was similarly delayed in afebrile patients who presented with nonspecific symptoms.<sup>12</sup> Unfortunately, the initial failure to diagnose SARS infection in those patients led to a devastating outbreak.<sup>11,12</sup>

It is possible that older adults may not exhibit the typical inflammatory febrile response due to changes in thermoregulation and immune cell dysregulation.<sup>13</sup> Age-related changes in the immune system render the body more susceptible to infections, and older adults may exhibit dysregulated immune cell responses to infections.<sup>14</sup> Therefore, clinicians should be mindful of the possibility of an atypical or late-stage presentation of serious infections in older patients.<sup>10</sup>

The balance between resource management and public safety remains very delicate in the context of a rapidly growing pandemic.<sup>15</sup> Particularly in this scenario, limited medical resources force policymakers to allocate resources based on a careful consideration of competing ethical values.<sup>15</sup> In this case, we were fortunate to have a dynamic and instantly responsive command administration and infection control task force. These teams orchestrated a coordinated case management effort that undeniably prevented a costly outbreak in our community.

In conclusion, this case highlights a unique presentation of COVID-19 that did not meet the current WHO case definition criteria. The recognition of this atypical presentation and utilization of a more liberal testing strategy, especially for at-risk populations (eg, older adults), is crucial to the avoidance of outbreaks of pandemic diseases in healthcare facilities.

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**Author Contributions:** Contributed equally as co-authors: Alkeridy and Almaglouth. Wrote the case report, collected the clinical data, and contributed to the initial manuscript draft: Alrashed, Alayed, Binkhamis, and Alsharidi. Edited and reviewed the manuscript: Liu-Ambrose.

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