

CASE REPORT

Infectious Disease

A sentinel COVID-19 case in Houston, Texas: Informing frontline emergency department screening and preparedness

Monica Lopez MD  | Samuel Luber MD, MPH | Samuel Prater MD |
Luis Ostrosky-Zeichner MD | Jamie McCarthy MD | Guillermo Suarez MD |
Bentley J. Bobrow MD

McGovern Medical School at University of Texas Health Science Center at Houston (UTHealth), Memorial Hermann Health System, Houston, Texas, USA

Correspondence

Monica Lopez, MD, McGovern Medical School at The University of Texas Health Science Center at Houston (UTHealth), Memorial Hermann Health System, 6431 Fannin, 2nd Floor JLL, Houston, TX 77030, USA.

Email: monica.y.lopez@uth.tmc.edu

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Abstract

In December 2019, a cluster of severe pneumonia cases of unknown cause was reported in Wuhan, Hubei province, China. A novel strain of coronavirus belonging to the same family of viruses that cause severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) was identified. In February 2020, cases began being identified in the United States. We describe a sentinel COVID-19 patient in Houston, Texas, who first presented on March 1, 2020. The patient did not meet criteria for a Person Under Investigation (PUI) as recommended by the Centers for Disease Control and Prevention (CDC) at the time. This case has broad implications for emergency department screening and preparedness for COVID-19 and other future infectious diseases.

KEYWORDS

atypical symptoms, Corona Virus, COVID-19, disease surveillance, emergency medicine, infectious disease, preparedness

1 | INTRODUCTION/BACKGROUND

As of March 23, 2020, the United States Centers for Disease Control and Prevention (CDC) is reporting that there have been 33,404 cases reported across all 50 states and US territories, and 400 COVID-19 related deaths. Based on patient characteristics from the first reported cases, in particular the lethal cases, the earliest guidelines put forth by the CDC recommended screening patients who had recently traveled to high-risk countries for symptoms including fever, cough, and shortness of breath.¹ Yet, as evidenced by this sentinel Houston, Texas case, patients with COVID-19 infection can present with gastrointestinal symptoms and fatigue, without fever or respiratory symptoms. If patients with atypical or less common symptoms can be identified and

managed appropriately, spread of infection in the community and exposure to healthcare workers can be minimized.

2 | CASE

On March 1, 2020, an approximately 70-year-old female resident of Houston, Texas, presented by private vehicle to a 52-bed community hospital emergency department (ED) with a chief complaint of 10 days of watery non-bloody diarrhea and generalized fatigue. She reported that her symptoms had been present for 9 days. Additionally, she reported anorexia, but denied fever, cough, vomiting, sore throat, congestion, or shortness of breath. She had no significant

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medical history, medications, or allergies and did not use tobacco or alcohol. Ten days before her ED presentation, the only information the patient revealed was that she had returned from a trip to Egypt and endorsed she could not provide further details. Standard travel evaluation confirmed that she had not traveled to 1 of the 5 countries identified by the CDC at that time for risk assessment screening. Triage vital signs were: 98.5 degrees Fahrenheit (oral), with blood pressure of 117/86 mmHg, pulse 85 beats per minute, respiratory rate 18 breaths per minute, and oxygen saturation of 98% on room air. Physical exam revealed a non-toxic, but tired-appearing female in no acute distress. She was noted to have dry mucous membranes. Heart, lung, abdominal, and skin exams were normal. The following labs were ordered: complete blood count with differential, basic metabolic panel, liver function tests, magnesium (Mg), phosphorus (Phos), calcium (Ca), and urinalysis (UA). Lab work demonstrated the following abnormalities: segmented neutrophils 80.5%, lymphocytes 10.4%, glucose 68 mg/dL, protein 4.8 g/dL, albumin 1.9 g/dL, Ca 6.4 mg/dL, Mg 1.6 meq/L. All other labs were within normal limits. No imaging studies were ordered. The patient was treated with 2 L of intravenous fluids, and magnesium and calcium were repleted. Upon repeat exam, the patient was clinically improved and was able to tolerate oral fluids. She was discharged from the ED with a presumptive diagnosis of traveler's diarrhea and prescribed 7 days of oral ciprofloxacin.

On March 4, 2020, the patient returned to the same ED. In the time since her first ED visit, 2 of her travel companions had developed cough and fever triggering them to be tested for COVID-19 at another hospital and their results were pending. The local health department had notified the patient she was a close contact of the other individuals and instructed her to return to the ED for evaluation and COVID-19 testing. During this second ED visit, the patient was re-evaluated by the same resident physician. The patient was clinically improved; however, she still complained of fatigue and poor appetite, this time associated with decreased stooling. She continued to deny fever or respiratory symptoms. Vital signs and physical exam at the second ED visit were normal. Further detailed travel history revealed that she had been on a week-long cruise on the Nile River that remained within Egypt, and the patient denied any layovers or travel in other countries. Due to the patient's improved clinical appearance and normal vital signs, no additional testing beyond COVID-19 was clinically indicated for the second ED visit. With this additional travel history and close contact with Persons Under Investigation (PUIs), the patient was treated as a PUI. A surgical mask was placed on the patient and hospital staff donned personal protective equipment (PPE) including N95 respirator, glasses, gown, and gloves. Specimens for 2019-nCoV diagnostic testing were obtained in accordance with the CDC guidelines. The patient was clinically stable and was discharged home with instructions for a 14-day self-quarantine. Approximately 60 hours after the swab samples were collected, hospital staff were informed that the patient tested positive for COVID-19. The patient was updated about her positive COVID-19 status and 11 healthcare workers including physicians, nurses, and a scribe who participated in the patient care during the initial ED visit were placed on self-quarantine. All staff have, to date, remained asymp-

tomatic and were COVID-19 test negative. To date, the patient has remained at home.

3 | DISCUSSION

COVID-19 is a potentially severe respiratory infection caused by SARS-CoV-2. As its name implies, the hallmark of this condition has been described as respiratory symptoms. This case report is one of the first confirmed cases of 2019-nCoV in the Houston area and describes several key features of this emerging outbreak that are not yet widely recognized by medical professionals or the public. The overall picture of COVID-19 is evolving rapidly with much still unknown about its spread, incubation, infectious periods, and clinical presentation. EDs are the most likely patient entry points into the healthcare system during an infectious disease pandemic such as COVID-19. EDs and practitioners must remain vigilant in screening protocols and procedures for treating possibly infected patients while concomitantly protecting their workforce and continuing to care for other sick and injured patients who continue to need care. This is challenging when details of the infection are still emerging. Our case demonstrated some attributes which delayed this patient's COVID-19 diagnosis. While our patient had traveled to Egypt, at the time of her presentation this country was not identified as a hotspot of COVID-19 and being on a cruise ship alone was underappreciated as a risk factor for exposure. Since then, being on a cruise ship has been added to the CDC's list of risk factors to help screen patients for possible testing for COVID-19; however, Egypt continues to not be on the CDC's list of high-risk destinations.¹ Additionally, our patient's lack of fever or respiratory symptoms led triage staff and emergency physicians to not consider her a PUI for COVID-19 on initial presentation. This ultimately delayed her diagnosis and resulted in an exposure at the ED.

As more COVID-19 cases are reported, not surprisingly, a range of symptoms is being documented. Similar to other viruses, COVID-19 patients can present with varying symptoms involving more than 1 organ system. The CDC website reports between 11% and 75% patients present with the complaint of fatigue.^{2,3} The frequency of gastrointestinal symptoms as a primary feature of COVID-19 infection suggests variations in severity and possibly transmission. Possible fecal-oral transmission of COVID-19 appears likely, even when respiratory testing is negative.^{4,5} Additionally, asymptomatic COVID-19 carriers have emerged, and if common, would make widespread COVID-19 prevention extremely challenging.⁵ The early COVID-19 case we identified in the ED setting underscores the importance of not only careful observance of the CDC guidelines but surveillance of evolving early case reports which eventually inform those guidelines. Broadening symptom screening guidelines to include gastrointestinal symptoms (eg, vomiting, diarrhea, abdominal pain) for COVID-19 could help identify carriers with mild infection and allow for earlier identification before more serious symptoms and is optimally balanced with availability of screening personnel and PPE equipment. From a public health perspective, more inclusive criteria for screening could increase

detection and speed interventions, including quarantine, thereby helping to limit the spread of the COVID-19 virus.

EDs need to be proactive about protecting staff on the frontlines of the COVID-19 pandemic. Important lessons learned from this early COVID-19 case is that in rapidly evolving situations such as this, donning PPE even when there is only a moderate suspicion for infection seems reasonable until further data are collected. Moderate suspicion is appropriate for infectious gastrointestinal symptoms and fatigue even without respiratory symptoms or fever since this indicates active infection, and this information must be combined with the history to determine indication for categorizing patients as PUIs and ordering testing. Risk stratification is a moving target which takes into account evolving suspicious symptoms and high-risk destinations along with the physician's clinical assessment. As COVID-19 infection spreads and suspicion increases, another consideration is that donning appropriate PPE will put a strain on supply of such equipment. Yet, PPE is a necessary investment in the healthcare workers on the frontline, especially because more specialized workers such as ED nurses and emergency physicians cannot be replaced easily. Without these healthcare workers, those infected with COVID-19 cannot be identified or treated appropriately for the sake of those infected individuals but also to stop the spread to the community at large. This case demonstrated that more robust screening for COVID-19 with a higher suspicion given to those with *any* cruise travel history, gastrointestinal complaints, or extreme fatigue, even in the absence of fever, or respiratory complaints would have been beneficial. This case changed our institution's COVID-19 screening criteria. As of March 9, 2020, our hospitals have started including gastrointestinal complaints into screening patients as well as hospital employees at risk of COVID-19 infection with the hope of further helping contain this evolving pandemic.

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ORCID

Monica Lopez MD  <https://orcid.org/0000-0002-5162-4281>

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