

Sentinel Case of COVID-19 at Fort Stewart, GA in a National Guard Soldier Participating in Annual Training: A Case Report

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ABSTRACT For healthcare providers, specifically military and federal public health personnel, prompt and accurate diagnosis and isolation of SARS-CoV-2 novel coronavirus patients provide a two-fold benefit: (1) directing appropriate treatment to the infected patient as early as possible in the progression of the disease to increase survival rates and minimize the devastating sequelae following recovery and remission of symptoms; (2) provide critical information requirements that enable commanders and public health officials to best synchronize policy, regulations, and troop movement restrictions while best allocating scarce resources in the delicate balance of risk mitigation versus mission readiness. Simple personal protective measures and robust testing and quarantine procedures, instituted and enforced aggressively by senior leaders, physicians, and healthcare professionals at all levels are an essential aspect of the battle against the COVID-19 pandemic that will determine the success or failure of the overall effort. As consideration, the authors respectfully submit this vignette of the first confirmed positive COVID-19 case presenting to the Emergency Department at Winn Army Community Hospital, Fort Stewart, Georgia.

INTRODUCTION

The novel 2019 coronavirus disease (COVID-19) pandemic has a potential to find a perfect vector for transmission within the confines of the U.S. military population because of the intrinsic nature of the uniformed services to carry out daily tasks and operations in close quarters and the frequent worldwide movements of its members. A perfect example of this would be the recent outbreak of COVID-19 on the USS Theodore Roosevelt Aircraft Carrier and subsequent media coverage. Conversely, the military may be uniquely equipped to handle an outbreak and strongly enforce mandatory social distancing, because of strict adherence to military orders, regulations, and the Uniform Code of Military Justice. This allows for a rapid response in the effort to slow the transmission of the disease within its own population and consequently flatten the curve. Conceivably, this could be utilized as a model for the effectiveness of social distancing in larger civilian populations. In this report, we discuss the sentinel case of confirmed COVID-19 at Winn Army Community Hospital, Fort Stewart, Georgia.

CASE

A 36-year-old male soldier presented to the emergency department (ED) on March 19, 2020 complaining of a 4 day history of fever, chills, cough, rhinorrhea, nausea, vomiting, and

diarrhea. The patient was on mobilization for his national guard annual training and had recently traveled to Fort Stewart from Bartow County, Georgia, on March 7, 2020. The patient had been seen for the same symptoms 72 hours before ED presentation at the local Troop Medical Clinic and been given a provisional diagnosis of acute frontal sinusitis for which he was prescribed six azithromycin 250 mg tablets (ZPAK EQ), acetaminophen 325 mg, and guaifenesin/pseudoephedrine 60 mg tablets as treatment. A complete blood count (CBC) with automated differential was drawn on the same day, with results that were wholly within normal limits, with the exception of mild lymphopenia (absolute lymphocytes 0.9; lymphocytes 15.1).

Upon presentation to the ED, the patient reported continued fevers, mild nasal congestion, pharyngitis, and several episodes of emesis and diarrhea. Vitals signs upon arrival were unremarkable; blood pressure 102/63, heart rate 72, respiration rate 18, peripheral capillary oxygen saturation (SpO₂) 98% on room air, and temperature 97.6° Fahrenheit (patient took 1,000 mg of acetaminophen ~5 hours before ED arrival). In fact, the patient believed that his symptoms were improving, but had been ordered to the ED by his chain of command out of concern for COVID-19 infection. The ED personnel followed the screening guidelines for assessment of the 2019 novel coronavirus (2019-nCov) as set by the Center for Disease Control and Prevention (CDC).¹ The patient denied recent travel to “high risk” countries or close contact with anyone with a known 2019-nCov illness, but is a resident of an area which reported a cluster of COVID-19 cases. He was issued a facemask and isolated in a private examination room and only examined by personnel wearing appropriate personal protective equipment (PPE).

Pertinent positives from the review of systems included cough, nausea, vomiting, diarrhea, and fever. Physical exam revealed a mildly ill-appearing male in no acute distress with the only significant findings being clear effusion behind

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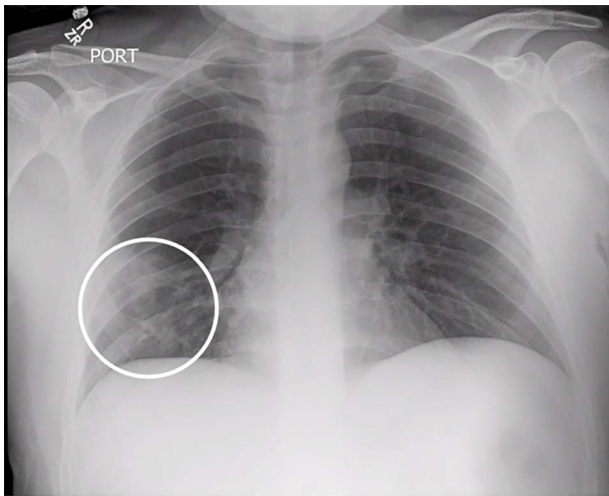


FIGURE 1. Chest X-ray: hazy, peripheral opacities (white circle).

bilateral tympanic membranes without erythema or bulging, moderate clear nasal discharge, and mild pharyngeal erythema without edema. Pulmonary auscultation was clear bilaterally and without visible retractions upon inspiration.

Portable chest radiography was performed and the results were interpreted as being consistent with right middle lobe pneumonia (Fig. 1).

CBC results were significant for lymphopenia at $3.3 (10^3/uL)$. Comprehensive metabolic panel (CMP) findings showed creatinine of 1.4, and alanine transaminase (ALT) elevation of 111, findings that are consistent with the most recent data suggestive of COVID-19 infection.²⁻⁴ C-reactive protein (CRP) was elevated approximately five times the upper limit of normal at 45.2 mg/L. Patient was swabbed for rapid strep, respiratory syncytial virus, and rapid influenza, all with negative results. Based on these findings, and his recent travel history from an area with a cluster of confirmed cases, the decision was made to obtain a computed tomography (CT) of the chest to better quantify the extent of the abnormalities seen on X-ray. Noncontrast CT revealed multifocal airspace disease bilaterally with several small nodular densities, peripherally based bilateral ground glass opacities, consolidation that was suspicious for atypical infection, and splenomegaly (Fig. 2). These constellations of signs and symptoms were tentatively considered as pathognomonic for COVID-19 infection in this medical facility at the time. The decision was made to test the patient for COVID-19 utilizing the supplied test kit. The specimen was shipped to the CDC for analysis.

Public health officials were subsequently consulted as to the proper disposition of this case. Because of his benign and nontoxic appearance throughout the examination, a decision was made to isolate the patient with daily visits by public health personnel for surveillance of respiratory complications and quarantine compliance. The patient was given 1 L of lactated ringers and 1 g of ceftriaxone intravenously in the ED and discharged with 750 mg of oral levofloxacin daily for 5 days and doxycycline 100 mg twice a day for

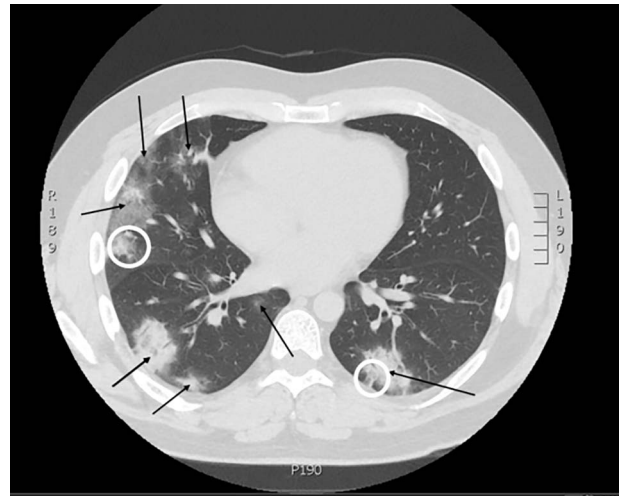


FIGURE 2. CT: ground glass opacities (black arrow), "crazy paving" (white circle).

10 days to cover possible bacterial etiologies of illness. He was prescribed benzonatate, guaifenesin, and acetaminophen for symptom control. The final dose of his previously prescribed azithromycin was discontinued at this time as it was considered inappropriate. Isolation was accomplished at local quarters specifically designated for suspected COVID-19 cases and monitored by installation public health. Isolation of known contacts and his unit was also initiated at this time. Postdischarge, his vitals were observed every 24 hours for 48 hours and then twice daily as the protocols evolved for his suspected COVID-19 quarantine. Seventy-two hours after ED discharge, he developed shortness of breath (SOB) with minimal exertion. Lung examination was again clear to auscultation in all fields. SpO₂ was observed to drop to 86% with exertion and maximum of 91% with rest. The soldier was able to improve his SpO₂ to 94% by having him warm his hands, likely indicating an inaccurate initial pulse oximetry reading because of peripheral vasoconstriction. Concern for true hypoxia was low at this point, so he was returned to his room with continued follow-up and acknowledgement of a thoroughly understood notification protocol. On March 24, the patient complained of nausea and vomiting that was attributed to the antibiotic regimen that he had been discharged from the ED on, and all antibiotics were discontinued at this point. On March 26, 2020 his COVID-19 test returned with a positive result. After a 14-day quarantine and resolution of symptoms, the patient was released and authorized to return to home. At the time of submission of this manuscript, the patient had made a full recovery without further incident or reported sequelae.

DISCUSSION

SARS-CoV2 (2019 novel coronavirus) is an RNA enveloped coronavirus that binds to angiotensin converting enzyme 2 receptors on type two pneumocytes. It is primarily spread

via droplet particles, but aerosolization can occur and the CDC recommends airborne isolation and protection whenever possible and practical. Other vectors of transmission are possible, and likely, but unclear at the time of this publication. Additionally, what makes this virus difficult to control is that it can be spread by asymptomatic carriers who can ostensibly shed the virus from 20 to 40 days. COVID-19 boasts an incubation period of ~3–14 days by current literature.⁴ The soldier presented with both ongoing symptoms of this infection and recent history of at least five signs or symptoms of COVID-19, his hallmark laboratory findings were consistent as well. Common symptoms include: fever (83–99%), cough (59–82%), fatigue (44–70%), anorexia (40–84%), and SOB (31–40%). Suggested workup and findings include a CBC (leukopenia and lymphopenia), CMP (increased bun/creatinine ratio, AST/ALT, total bilirubin), and increased D-dimer, CRP, Lactate Dehydrogenase, interleukin-6, and ferritin. Normal or decreased levels of procalcitonin are common, but have been noted to be elevated with critically ill patients.^{2–4}

The difficulty with COVID-19 infection is that it mimics a vast differential of infectious processes that are generally benign in process and resolution. Furthermore, the progression of COVID-19 does not appear to follow a linear progression at this time, and prediction of respiratory decline is difficult at best. This patient presented with a relatively benign appearance, yet his travel from an area with a cluster of infections and the persistent symptoms despite antibiotic treatment raised red flags for both his chain of command and screening medical personnel. A missed diagnosis and delay in treatment because of improper antibiotic selection or misunderstood screening protocols could have exponentially exposed more of his unit and the Fort Stewart community to this infected individual.

Adhering to proper utilization and adherence of PPE in Hong Kong, medical professionals were able to completely prevent nosocomial infections over a 42-day period treating 1,275 COVID-19 suspected patients, 42 of which eventually tested positive, through aggressive hand hygiene practices and standard wear of surgical/procedural masks.⁵ Data from literature suggest that proper isolation and social distancing may reduce peak healthcare demand by two-thirds, and deaths by half.⁶ If ventilator management is indicated, personnel must use airborne particle precautions, as the equipment aerosolizes the infectious agents. As such, routine use of high flow nasal cannula and noninvasive positive pressure ventilation is discouraged in suspected patients without containment.

The results for this subject took 7 days for confirmation. While treatment and management of these patients are currently supportive, both before and after official results return, there exists a possibility of a delay in tightening of health protection measures in areas that have not yet identified positive cases. As such, this report recommends diagnostic testing for suspected COVID-19 early. In this case, a robust and rapid testing capability would have allowed officials greater knowledge of the patient's unit members' health status, thereby

minimizing degradation of readiness and interruption of ongoing operations. In hindsight, this patient did not receive clearance testing at the end of his 14-day quarantine period before he was discharged from isolation. Now, we would suggest two consecutively negative tests separated by at least 24 hours before termination of quarantine procedures. Public health officials and commanders need this information to make well-informed decisions.

Treatment and management modalities are evolving constantly. For mild infections, those with mild pneumonia without hypoxia or dyspnea, home isolation and typical cold symptom management are indicated. For those with more severe infection with hypoxia, dyspnea, or >50% lung involvement, hospitalization is typically indicated. Interim guidelines for the clinical management of COVID-19 positive patients are available online and frequently updated.^{4,7}

Current local treatment facility protocol screens all individuals at entrance points for fever and symptoms consistent with COVID-19 infection. Positive answers to screening criteria direct a more thorough evaluation by ED personnel with proper PPE with potential testing; those with symptoms are subsequently quarantined until test results are confirmed. When this patient presented to the ED, a dedicated "dirty hall" had not been set-up yet, but he was examined in the negative pressure room in the ED. Within days of his presentation, the ED established a negative pressure containment hallway with multiple rooms dedicated solely to COVID-19 presumptive patients. This facility does not boast a true intensive care unit (ICU) capability, but a dedicated wing of the intermediate care ward was quickly outfitted, staffed, and isolated for the sole purpose of long-term management of COVID-19 patients in the event that transfer to an off-installation ICU was denied because of civilian hospitals reaching capacity. Additionally, all military members reporting to the installation are now placed in a mandatory 14-day symptom-free quarantine, in designated barracks or personal residences, before being authorized to intermingle and in-process with the local population.

CONCLUSION

This case report demonstrates the presentation and hallmark findings associated with SARS-CoV-2 novel coronavirus infection that emergency medicine and primary care clinicians may use to help identify future cases. As our knowledge of the epidemiology of COVID-19 continues to grow, public health policy will continue to be reviewed and evolve to best facilitate day-to-day operations. The accurate and timely sharing of facts and data points will assist in the evolution and response to the epidemiological and pathophysiological changes of SARS-CoV-2, 2019 novel coronavirus.

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