Case Report: COVID-19 Patient With Chief Complaint of Anosmia and Ageusia; a Unique Perspective on Atypical Symptomatology and Management in the Military

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ABSTRACT
A novel corona virus, severe acute respiratory syndrome coronavirus-2, found in Wuhan, China in December 2019 has since spread to multiple continents and has been implicated in thousands of deaths. This pandemic—causing virus has been initially described (corona virus disease 2019 [COVID-19]) with the presentation of fever, cough, and shortness of breath. The majority of studies published have been conducted on inpatient cases and a shortage of tests has encouraged screening only of patients with classic presentation. A positive COVID-19 case of a healthy military male, with the chief complaint of anosmia and ageusia, instigated local re-evaluation of the screening protocol for possible COVID-19 patients. Multiple studies in Europe have implicated anosmia and ageusia as symptoms associated with COVID-19, and subsequently, anosmia and ageusia have been added to Centers for Disease Control and Prevention screening guidelines as well. There should be a higher index of suspicion when evaluating a patient with high-risk activities, travel, and atypical symptoms. More studies need to be conducted with a healthy outpatient population to further understand this disease and decrease its impact.

INTRODUCTION
In Wuhan, China, 4 cases of pneumonia “of an unknown cause” were reported in association with the Huanan Seafood Wholesale Market in late December, 2019. A novel beta-coronavirus, 2019-nCoV, was later isolated in respiratory epithelial cells. Li et al. analyzed the first 425 cases of novel coronavirus—infected pneumonia and found the same virus now known as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). The team discovered that only 55% of cases at that point were linked to the seafood market, the epidemic doubled every 7.4 days, and each patient infected an average 2.2 other people. Coronavirus disease 2019 (COVID-19), the pathogen SARS-CoV-2, has spread as a global health emergency to 6 continents and 66 countries. On March 11, 2020, the World Health Organization (WHO) declared COVID-19 as a pandemic. To date (April 20, 2020), there have been 2,458,150 confirmed cases worldwide, with the highest number of cases (776,513) in the United States. There have been 168,906 deaths worldwide, with the highest number of deaths (24,114) in Italy.

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There are currently 6 other known coronaviruses that cause disease in humans. Four of these viruses (229E, OC43, NL63, and HKU1) cause common cold-like symptoms in normal immunocompetent patients. Two other strains, SARS-CoV and Middle East Respiratory Syndrome coronavirus have been known to be fatal. SARS-CoV started as an epidemic in Asia, with the majority of cases in China in 2002–2003. Patients typically presented with fever, dry cough, headache, and hypoxemia. Fatal cases had progressive respiratory failure secondary to alveolar damage. SARS-CoV-2 is over 70% genetically similar to SARS-CoV.

Wang et al. evaluated 138 patients in Wuhan, China and found common clinical features of COVID-19 to include: fever in 99%, fatigue in 70%, dry cough in 59%, anosmia in 40%, myalgias in 35%, dyspnea in 31%, and sputum production in 27%. Multiple studies have shown pneumonia to be the most common serious manifestation of COVID-19. Wang et al. found that 26.1% of the 138 patients were transferred to the intensive care unit for acute respiratory distress syndrome, arrhythmias, and shock. Some patients have been found to be asymptomatic or present with atypical symptoms like diarrhea.

CASE REPORT
In the United States, on March 19, 2020 (Day 1), a 21-year-old an active duty male, otherwise healthy, presented to military sick call clinic with a new frontal headache for 3 days. He works as a survival equipmentman in a busy environment and was uncertain about contact with any sick (symptomatic) people, but he denied any known history of COVID-19 contacts. Of note, he recently traveled out of the local area, where he engaged in recreational activities like going to clubs and walking on the beach, but denied any...
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FIGURE 1. Timeline of events in case presentation.

trauma. His review of systems was notable for congestion and an occasional, scarce, nonproductive cough, which the patient described as “only occurred a few times during a two-hour interval and resolved with drinking water”. Review of systems was otherwise negative. His physical exam revealed that he was neurologically intact with normal vital signs. He was prescribed naproxen and given return precautions.

On Day 4, he was cooking at home, when he realized he had lost the sensations of taste and smell. He reported to sick call the following day with a chief complaint of anosmia and ageusia. Review of systems was positive for nasal congestion but otherwise negative. Physical exam revealed a healthy male, afebrile, nontoxic with normal vitals, no evidence of nasal erythema/polyps with normal nasal septum, and he was grossly neurologically intact. Because of the difficult nature of gustatory or olfactory testing and his low-risk profile, this testing was not completed. He was started on a trial of allergic rhinitis agents including Fluticasone, Loratadine, and sodium chloride nasal spray and instructed to follow-up in 1 week if unresolved for further evaluation with otolaryngology, neurology, or advanced imaging.

On Day 7, he was tested for Influenza A/B and COVID-19 via nasopharyngeal swabs. Results revealed that he was negative for Influenza A/B and positive for COVID-19. He subsequently was placed in isolation, and close contacts were tested. He was monitored daily by virtual appointments with his primary care physician and pulmonology. Otolaryngology was contacted, and recommended continuing his fluticasone, loratadine, and sodium chloride nasal spray.

He intermittently experienced episodes of loose stool and headaches over the next couple of days. On Day 13, his gustatory sense returned suddenly, and he has noted a gradual return of his olfaction.

On Day 21, he returned to clinic for re-evaluation. His anosmia had resolved by “80–90%” per his estimate, with complete resolution of ageusia, and no other symptoms. It had been 14 days since his testing and he was asymptomatic, prompting his return to full duty (Fig. 1). He never developed a fever or shortness of breath. His close contacts that were tested were all negative for COVID-19 and never developed symptoms. This includes a sexual partner with whom he had contact while symptomatic and before his positive test.

DISCUSSION

Early during the pandemic arrival to the United States (mid-March 2020), the Centers for Disease Control and Prevention (CDC) had identified priorities for COVID-19 testing that hierarchizes hospitalized patients and hospital facility workers, followed by high-risk patients with comorbidities, followed by patients with classic symptoms (fever with cough and/or shortness of breath).10 In the following weeks, the U.S. Navy started to implement the screening guidelines used by Command U.S. Fleet Forces Navy North (CUSFF/NAVNORTH) for screening COVID-19 patients at entry points. CUSFF/NAVNORTH screening is based on guidelines from CDC. It includes a questionnaire evaluating risks and symptoms. Symptoms previously listed included cough, fever, shortness of breath, and sore throat. In addition, the questionnaire queried risks that included international travel, domestic travel outside of the local area, and contact with someone who has tested positive for COVID-19. Patients not meeting criteria are nonpriority on the CDC hierarchy of testing for COVID-19.10 Based on the CDC guidelines at the time of his presentation this service member did not meet testing criteria. In addition, based on the CUSFF/NAVNORTH screening, he may have screened positive to be considered for testing because of his travel but this was not locally implemented until after his initial time of presentation. His only risk factor on the CUSFF/NAVNORTH screening questionnaire was travel outside of the local area.

Atypical presentation of COVID-19 has been previously documented.3 Lechien et al. conducted a study in Europe among 12 different hospitals in Belgium, France, and Italy of 417 COVID-19 positive patients. Olfactory and gustatory dysfunctions were prevalent among the positive patients at
85.6% and 88.0% respectively. Of those cases, 11.8% had olfactory dysfunction as the presenting symptom. Even in the patients who presented without rhinorrhea or nasal obstruction (18.2%), a majority (79.7%) reported hyposmia or anosmia.11 Giacomelli et al. did a cross-sectional survey in Milan, Italy and found that of 59 positive patients that were able to be interviewed, 33.9% reported a gustatory or olfactory disturbance or both at 18.6%. Both Giacomelli et al. and Lechien et al. showed a higher prevalence of olfactory taste disorders in females. Giacomelli et al. found a correlation with younger patients having a higher gustatory olfactory disorder.12

Few studies have been done for outpatient evaluation of symptoms in a healthy population. Bagheri et al. conducted an online cross-sectional study in Iran following a resurgence of olfactory dysfunction in otolaryngology clinics. The study of 10,069 participants found a positive correlation with anosmia and hyposmia and COVID-19 patients, especially in the setting of sudden onset of anosmia.13 A study in the UK by Menni et al. surveyed 1,573,103 individuals on a mobile application and found that a subset of 579 individuals was positive with COVID-19. Of those individuals, 59% had dysfunction of gustatory or olfactory senses. The combination of loss of smell and or taste with fever, cough, fatigue, diarrhea, abdominal pain, and loss of appetite was predictive of loss of smell and or taste with fever, cough, fatigue, diarrhea, abdominal pain, and loss of appetite with COVID-19.14

The studies discussed, as well as our case presentation show that anosmia, hyposmia, ageusia, and dysgeusia has a correlation with COVID-19 and should increase suspicion for the disease. With the shortage of tests and screening guidelines targeting patients with only classic symptoms, it is unclear what the distribution of symptoms for a healthy younger population actually represents. Anosmia and ageusia may be underrepresented in the symptomatology of healthy young populations, and furthermore, there are likely other atypical symptoms that might be more prominent with SARS-CoV-2 associated infection.

Since this case presentation, CUSFF/NAVORTH has added loss of taste or smell to the screening guidelines. Sudden anosmia is most commonly associated with trauma and respiratory viruses.15,16 Allergic rhinitis and sinus polyps are also common and tend to have a more gradual onset of anosmia.17 Initial approach typically includes history (including trauma, headaches, infections, allergic rhinitis symptoms, taste association, other associated symptoms, etc.) and physical exam including neurologic and head, ears, eyes, nose, and throat which might require an otolaryngologist for better visualization of nasal cavity and sinuses. Initial use of imaging, particularly MRI for isolated idiopathic anosmia and hyposmia is not warranted.18 Treatment of anosmia typically targets the intranasal inflammation (topical corticosteroids, systemic corticosteroids, antihistamines, and surgery if failure of above and presence of polyps).19–21 Most postviral olfactory loss improves over time.22

Our patient was managed based on the guidelines, with almost complete resolution of his anosmia and ageusia within a few weeks of onset and fully recovered from his illness.

Per WHO guidelines, the patient met criteria for a mild infection (minor symptoms and asymptomatic without chronic disease, age < 60, and able to self-isolate). Home management for mild infection includes supportive care (hydration, antipyretics, and analgesics if necessary) and isolation (physical separation from other people and animals, remaining at home unless in need of medical care, and hygiene and mask precautions when near people).23 CDC guidelines currently divide patients into categories of asymptomatic patients and patients with fever and respiratory symptoms. Symptomatic patients can return to normal activity when they are afebrile without the use of antipyretics for 72 hours, show an improvement in respiratory symptoms, and at least 7 days have passed since symptom onset. Asymptomatic patients with a positive COVID-19 test may discontinue home isolation after at least 7 days have passed since the date of the test and they remain symptom free. For an additional 3 days, they should practice social distancing and should wear a face covering in public settings. Test-based strategies can also be used, requiring 2 consecutive negative nasopharyngeal swab specimens <24 hours apart, in addition to the above criteria.24

Our patient never developed a fever and technically had resolution of respiratory symptoms before being tested. He was monitored for a total of 14 days before reintroduction into the general military population and return to work. It is interesting to note his close contacts have neither developed symptoms nor tested positive for COVID-19. Therefore, we recommend further research on viral shedding and transmission so that optimized management of infected patients results in decreased transmission in both the military and civilian populations.

**CONCLUSION**

SARS-CoV-2, a novel corona virus, originally presented in Wuhan, China in December 2019 with classic symptoms of a pneumonia (fever, fatigue, dry cough, and shortness of breath).9 Since then, the disease COVID-19 has spread to multiple continents and been declared a pandemic.4 As the prevalence of the virus increases, the symptomatology profile continues to be updated. But as most early studies were focused on hospitalized patients, the healthy general outpatient population was likely underrepresented. Our case presentation of a healthy young male illustrates that atypical symptoms may be easily overlooked, especially with the initial stringent CDC testing guidelines early in the course of the pandemic. Screeners should use a high index of suspicion for possible COVID-19 patients in the setting of high-risk activities (not social distancing, travel) and atypical symptoms, particularly sudden onset anosmia and ageusia. More studies need to be conducted on a healthy outpatient population to further understand this disease and decrease its impact. As
testing capabilities mature, a clearer picture of symptoms, progression of illness, and sequelae is anticipated to enhance screening and testing guidelines.

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