Co-infection with SARS-CoV-2 and Human Metapneumovirus

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ABSTRACT

The novel coronavirus (now called SARS-CoV-2) initially discovered in Wuhan, China, has now become a global pandemic. We describe a patient presenting to an Emergency Department in Rhode Island on March 12, 2020 with cough and shortness of breath after a trip to Jamaica. The patient underwent nasopharyngeal swab for a respiratory pathogen panel as well as SARS-CoV-2 RT-PCR. When the respiratory pathogen panel was positive for human metapneumovirus, the patient was treated and discharged. SARS-CoV-2 RT-PCR came back positive 24 hours later. Although respiratory viral co-infection is thought to be relatively uncommon in adults, this case reflects that SARS-CoV-2 testing algorithms that exclude patients who test positive for routine viral pathogens may miss SARS-CoV-2 co-infected patients.

KEYWORDS: SARS-CoV-2, COVID-19, human metapneumovirus, co-infection

CASE REPORT

A 57-year-old female with a history of obstructive sleep apnea on continuous positive airway pressure, hypertension, and hyperlipidemia presented to the Emergency Department for evaluation of cough and shortness of breath for 4 days. Her symptoms started approximately 12 days after she returned from a trip to Jamaica. The patient initially developed a persistent dry cough and upper respiratory symptoms. She then developed shortness of breath a few days later as well as subjective fevers. She had no gastrointestinal symptoms. After visiting her primary care provider, she was referred to the Emergency Department. In the Emergency Department, the patient was immediately placed on maximum isolation precautions (negative pressure room, with anyone entering the room required to wear an N95 respirator, face shield, disposable gown, and gloves). She was afebrile with oxygen saturation of 92–95% on room air. Lung exam revealed wheezing. Blood work revealed a white blood cell count of 6.4 x 10^9/L, an absolute lymphocyte count of 0.8 x 10^9/L with an otherwise normal differential, and a platelet count of 253 x 10^9/L. Liver function tests were not ordered. A chest X-ray showed no pulmonary infiltrates. A nasopharyngeal swab was obtained for respiratory pathogen panel (RPP) and SARS-CoV-2 RT-PCR. RPP was positive for human metapneumovirus and the patient was discharged home with an albuterol inhaler and oral steroids. The positive result of SARS-CoV-2 RT-PCR was reported 24 hours later.

METHODS

Clinical specimens were collected in accordance with CDC guidelines. A nasopharyngeal swab was obtained and sent to the Rhode Island Department of Health for SARS-CoV-2 testing via RT-PCR. A respiratory pathogen panel was sent to the hospital's microbiology lab for testing using the GenMark Dx® ePlex™.

RESULTS

The patient tested positive for human metapneumovirus by the hospital laboratory and SARS-CoV-2 by the Rhode Island Department of Health.

DISCUSSION

Co-infection with two respiratory viral pathogens is uncommon in adults. A 2013 study that included 250 hospitalized adults with H1N1 influenza showed that 3.6% were co-infected. Additionally, they showed that co-infection with another respiratory virus was associated with a greater risk of complications, particularly treatment for secondary bacterial pneumonia, although duration of hospitalization was unchanged compared to mono-infected patients.[1] In a study of 186 patients with suspected COVID-19 infection in Shenzhen, China, 3.2% (n=6) tested positive for both SARS-CoV-2 and another viral respiratory pathogen.[2] Human metapneumovirus was one of the pathogens identified, along with respiratory syncytial virus, rhinovirus, parainfluenza virus 2, and coronavirus HKU1. Little is known about the clinical implications of co-infection with SARS-CoV-2 and other respiratory viruses. At least one other adult case has been described of co-infection with SARS-CoV2 and another viral pathogen, Influenza A.[3]

Although co-infection with dual respiratory pathogens is uncommon in adults, our patient had both metapneumovirus and SARS-CoV-2. Testing algorithms that exclude

SARS-CoV-2 testing among patients who have routine viral pathogens may miss co-infected patients. Currently, little is known about the clinical course of patients co-infected with SARS-CoV-2 and standard viral pathogens. There is evidence from the 2009 H1N1 influenza outbreak to suggest that co-infection with an emerging viral pathogen and a standard respiratory virus is associated with increased rate of complications compared to mono-infection with the emerging disease. This is an area of study that may warrant further research.

[*Editor's note: While 3.2% co-infection rates have been noted, as cited by the authors, a recent report out of Stanford reported on a series of 562 SARS-CoV-2 tests performed in their emergency department. Of the 49 positive SARS-CoV-2 results, 22.4% (11) were positive for additional viruses, including Rhinovirus/enterovirus, Metapneumovirus, and RSV. This information has not yet been peer reviewed and published, but is important and has been shared at the request of the California Department of Public Health.*]

References

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