SARS-CoV-2 Complicated by Sinusitis and Co-Infection with Human Metapneumovirus

ABDULRAHMAN ALHARTHY, MD; FAHAD FAQIHI, MD; DIMITRIOS KARAKITSOS, MD, PhD

ABSTRACT

A previously healthy 25-year-old Asian male was admitted with acute respiratory failure due to COVID-19 pneumonia to our intensive care unit. He received empiric therapy and higher level of respiratory support via a high flow nasal cannula. Notably, human metapneumovirus was detected from the nasopharyngeal swab by RT-PCR. Six days post-ICU admission, sinusitis was clinically and sonographically detected. SARS-CoV-2 was detected in the fluid aspirated from the antrum. The patient has made an uneventful recovery. Further studies are required to investigate co-infections with SARS-CoV-2 and other viruses.

KEYWORDS: COVID-19, human metapneumovirus, high flow nasal cannula, sinusitis

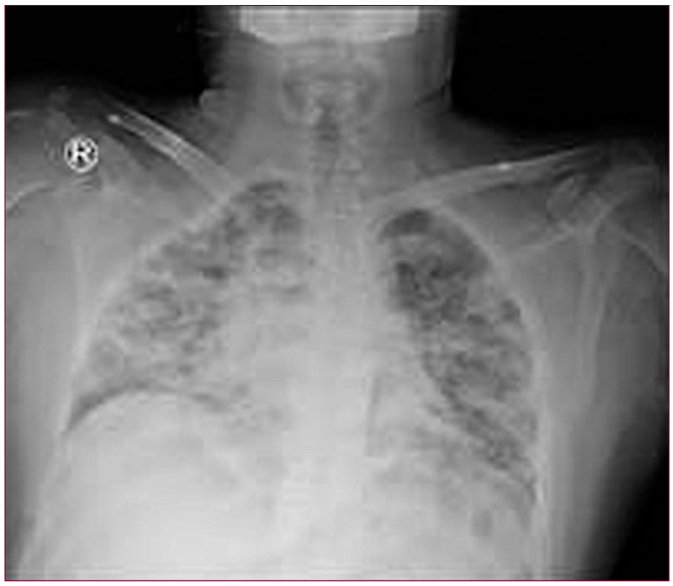
[**Editor's note:** The following letter/case report was submitted by senior author Dr. Dimitrios Karakitsos, who did surgical/clinical rotations at Brown-affiliated hospitals during the early 1990s as a visiting medical student on scholarship from Greece.]

Dear Editors:

We have read with interest the article by *Touzard-Romo et al* regarding the co-infection with SARS-CoV-2 and human metapneumovirus that was recently published in the Journal.[1] We present a patient with SARS-CoV-2 disease (COVID-19) and co-infection with human metapneumovirus (HMPV). Considerations regarding oxygen support therapies are also discussed.

A previously healthy 25-year-old Asian male was admitted to the emergency room with three days fever (37.9° C; 100.22°F), dry cough, wheezing, and chest pain. His saturation of peripheral oxygen (SpO_2) was 75% on room air but he did not show any respiratory distress. He mentioned contact with his brother who has recently recovered from COVID-19 without sharing any further details. Physical examination revealed decreased breath sounds at the lung bases. Laboratory findings were within normal limits apart from lymphocytopenia (0.79×10^9/liter; normal: 1.1–3.2× 10^9/L), and increased levels of C-reactive protein (656 mg/liter; normal: 0–5 mg/liter). Chest X-ray (**Figure 1**) revealed

Figure 1. Chest X-ray depicting bilateral interstitial pneumonia.

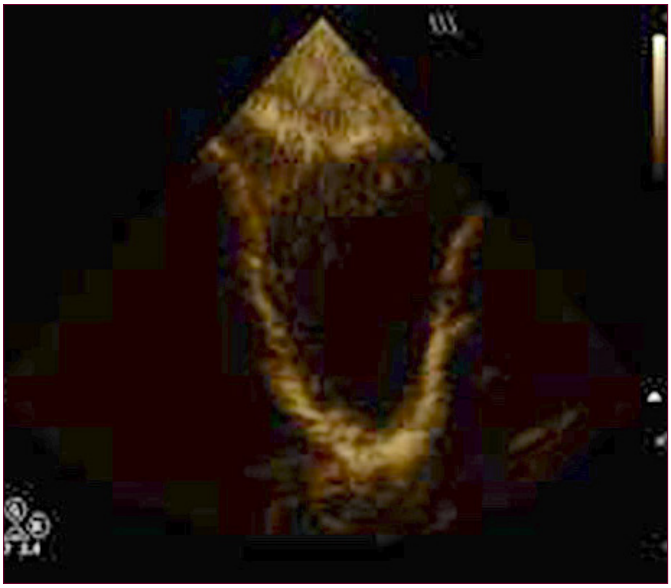


bilateral interstitial pneumonia. Nasopharyngeal swabs confirmed COVID-19 by Real-Time-Polymerase-Chain-Reaction (RT-PCR).

The patient was admitted to our intensive care unit (ICU). He underwent a full diagnostic work-up for other viral, bacterial and systemic disorders. A higher level of respiratory support via a high flow nasal cannula (HFNC) was initiated (flow: 60 L/minute, fraction of inspired oxygen 40%) along with awake prone positioning (16 hours daily). The rate of oxygenation index [oxygen saturation / (fraction of inspired oxygen x respiratory rate)] was maintained over 6 for the upcoming 48 hours indicating successful oxygenation.[2] Empiric therapy with lopinavir/ritonavir, ribavirin and interferon beta-1b for 14-days, dexamethasone for 10 days, and prophylactic anticoagulation was administered.

Interestingly, RNA of HMPV was detected from nasopharyngeal specimens by RT-PCR after four days; however, no genotype was identified (types A and B) as phylogenetic analysis was not available. No treatment changes were made as ribavirin has shown some efficacy against HMPV.[3] Six days post-ICU admission, the patient developed new fever (38.9° C, 102.02° F). He complained of pain due to the application of HFNC. He had sensitivity over the right paranasal sinus. Ultrasound examination depicted a fluid collection

Figure 2. Ultrasound showing hypoechoic area in the right paranasal sinus ("*sinusogram*") consistent with fluid collection.



(**Figure 2**).[4] Antral aspiration revealed clear fluid. RT-PCR performed on the fluid revealed SARS-CoV-2. Our patient has made an uneventful recovery. All work-up for systemic and other viral diseases was negative. He was discharged to home isolation after 22 days.

HMPV may cause lung infection in adults, especially elderly and immunocompromised patients as well as patients with underlying cardiopulmonary disorders. Diagnosis relies on RT-PCR, while treatment is mainly supportive. Co-infection with SARS-CoV-2 has only been recently reported.[1] Apart from the co-infection with HMPV, our patient has developed sinusitis while receiving oxygen via HFNC, which delivers high flow, warmed and humidified gas through the nasopharynx.[5] Whether this might facilitate recirculation and shedding of the viral particles in the upper airway is obscure. Further studies are required to investigate co-infections with SARS-CoV-2 and other viruses along with potential side effects of higher level oxygen therapies.

References

1. Touzard-Romo F, Tapé C, Lonks JR. Coinfection with SARS-CoV-2 and human metapneumovirus. *R I Med J.* 2020; 103(2):75-76.
2. Roca O, Caralt B, Messica J, et al. An index combining respiratory rate and oxygenation to predict outcome of nasal high flow therapy. *Am J Respir Care Med.* 2019; 119 (11):1368–1376.
3. Wyde PR, Chetty SN, Jewell AM, Boivin G, Piedra PA. Comparison of the inhibition of human metapneumovirus and respiratory syncytial virus by ribavirin and immune serum globulin in vitro. *Antivir. Res.* 2003, 60, 51–59.
4. Cengiz M, Celikbilek G, Andic C, et al. Maxillary sinusitis in patients ventilated for a severe head injury and with nostrils free of any foreign body. *Injury.* 2011; 42(1):33-7.
5. Genga S, Mei Q, Zhub C, et al. High flow nasal cannula is a good treatment option for COVID-19. *Heart & Lung.* 2020; 1-2.

Authors

Abdulrahman Alharthy, MD, Critical Care Department, King Saud Medical City, Riyadh, Kingdom of Saudi Arabia.

Fahad Faqihi, MD, Critical Care Department, King Saud Medical City, Riyadh, Kingdom of Saudi Arabia.

Dimitrios Karakitsos, MD, PhD, Critical Care Department, King Saud Medical City, Riyadh, Kingdom of Saudi Arabia; Critical Care Department, Keck Medical School, University of Southern California, Los Angeles, CA.

Disclosures

Funding: None

Conflict of interest: The authors declare that they have no conflict of interest.

Ethical approval: The patient provided a written consent for the use of his clinical data for scientific purposes.

Correspondence

Dr. Dimitrios Karakitsos
karakitsosdimitrios@gmail.com