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Correspondence

Co-infection with an atypical pathogen of COVID-19 in a young

Dear Editor:

The article by Jean et al.¹ published in the *Journal of Microbiology, Immunology and Infection*, wherein they reported the treatment options for coronavirus disease (COVID-19), was of immense interest. Despite the worsening trend of COVID-19, no drugs have been validated to exhibit significant efficacy in the clinical setting. The potential drugs, including remdesivir, hydroxychloroquine (HCQ), azithromycin, and immunomodulators, have not been subjected to large-scale studies or clinical trials. Kim et al.² reported that evaluation of other respiratory infections could aid the differential diagnosis and treatment of patients infected with COVID-19. Herein, we report the case of a young male patient co-infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and *Mycoplasma pneumoniae*. He was successfully treated with a 5-day course of HCQ and azithromycin.

This 28-year-old man had a history of dyslipidemia with regular medication. As stated, he travelled to New Zealand from February 28 to March 14, 2020. He presented shortness of breath and chest discomfort on March 17, 2020, after returning to Taiwan. He visited our emergency room for real time RT-PCR test for detecting SARS-CoV-2. He did not present any symptoms of fever, disorder of taste or smell, nausea, vomiting or diarrhea. He was admitted to the negative pressure isolation room soon after the RT-PCR test was found to be positive for SARS-CoV-2. At admission, the lab data revealed leukopenia (WBC: 3340/ μ L) and lymphopenia. The chest X-ray presented interstitial infiltration of bilateral lower lung fields (Fig. 1A). During hospitalization, his treatment regimen included azithromycin 500 mg PO stat, followed by 250 mg PO daily, tamiflu 1 # BID, and HCQ 400 mg PO daily for 5 days. Dizziness, lethargy, palpitation, or cardiac arrhythmia was not observed during the treatment course. The serological tests of other respiratory tract pathogens, including influenza A/B, pneumococcus, legionella, and chlamydia, presented

negative results; however, *M. pneumoniae* IgM and IgG titers were positive. We repeated the chest X-ray every 3 days and performed RT-PCR analysis of nasopharyngeal swab samples for detecting SARS-CoV-2 during hospitalization. The RT-PCR results were as follows: March 27 (+), April 3 (–), April 6 (+), April 7 (–), April 10 (–), and April 13 (–). Subsequently, electrocardiography revealed no prolonged QT, and the chest X-ray depicted resolution of bilateral lung field infiltration (Fig. 1B). Next, the patient was discharged.

Hydroxychloroquine (HCQ) prescribed for COVID-19 therapy during this outbreak is an off-label use. It increased the endosomal pH, which prevents the virus or cell fusion. Moreover, it interferes with the glycosylation of cellular receptors of coronavirus.^{1,2} Azithromycin was effective for treating *M. pneumoniae* and acts as an immunomodulator of respiratory viral infections.^{1,3,4} According to a recent study, azithromycin significantly fortified the efficacy of HCQ while treating 20 patients with COVID-19.¹ The promising clinical outcome among these COVID-19 patients was presumably due to the excellent efficacy of virus elimination after administering the combination therapy of HCQ and azithromycin.

Kim et al. reported that the prevalence rates of co-infection of COVID-19 were higher than those previously reported in Wuhan, China.^{2,5,6} The presence of non-COVID-19 pathogens (e.g., *M. pneumoniae*, influenza A/B, and rhinovirus) may not reveal that a patient is not infected by SARS-CoV-2. The prevalence of co-infection varies among the COVID-19 patients, ranging from 0% to 50% among the non-survivors.^{1,2,3} The reported co-pathogens included bacteria, such as *M. pneumoniae*, *Candida* species, and viruses (influenza and rhinovirus). Influenza A virus is the most common co-infecting virus.² Co-administration of anti-influenza and anti-bacterial agents in patients with COVID-19 is recommended.^{1,2,4} Furthermore, effective antibiotic administration for hospital-acquired pneumonia

<https://doi.org/10.1016/j.jmii.2020.05.007>

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Figure 1. (A). Chest X-ray presents interstitial infiltrations of the bilateral lower lung fields of a patient with COVID-19. (B). Chest X-ray shows significant improvement after hydroxychloroquine and azithromycin combination therapy.

in patients undergoing prolonged hospitalization (>7 days) has been advised.^{4,5,6}

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7 May 2020

Available online 21 May 2020