Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Correspondence

Co-infection of influenza B virus and SARS-CoV-2: A case report from Taiwan

Dear Editor,

In December 2019, the novel coronavirus (SARS-CoV-2) disease (COVID-19) was discovered after an outbreak in Wuhan, China. The disease has rapidly spread worldwide causing extensive damage to public health and medical systems. Similarly, the seasonal influenza A or B virus continues to cause considerable morbidities and mortalities globally, even after the introduction of annual influenza vaccines in recent decades. To date, few cases of co-infection of these two viruses have been described.[1,2] Here, we report a unique case of influenza B virus co-infection with SARS-CoV-2 in Taiwan.

A 48-year-old woman without any underlying disease was presented to our emergency department (ED) with a one-day history of fever, dry cough, sore throat, myalgia, and general fatigue. She denied of having any recent history of travelling abroad or contact history with people from China. Her daughter, who returned from the Netherlands, was tested positive for SARS-CoV-2 infection in March, 2020. Initial chest radiography (Fig. 1A) and computed chest tomography showed no noticeable sign of pneumonia patch or ground glass opacity (GGO). Owing to high suspicion of person-to-person domestic transmission from her daughter, we obtained a throat swab specimen and sent it to the Taiwan Centers for Disease Control (TW-CDC) for SARS-CoV-2 real-time reverse transcription polymerase chain reaction (RT-PCR). We also obtained another throat swab for examination by rapid influenza diagnostic test simultaneously. Approximately 1 h later, the test for the detection of influenza returned positive for influenza B virus. The patient was discharged from the ED with oral oseltamivir. Next day, the RT-PCR for SARS-CoV-2 came positive, and the patient was called back for further isolation management.

On the first day of hospitalization, adequate supportive therapy was administered including empirical antibiotics with ceftriaxone and azithromycin. We changed oseltamivir to baloxavir marboxil for treating influenza B infection. She developed dry cough and mild fever on the sixth day of hospitalization with no other respiratory discomfort. The chest radiography (Fig. 1B) on the same day also revealed newly developed bilateral pneumonia patches. Hydroxychloroquine (800 mg on the first day as loading dose, then 400 mg per day as maintaining dose) was administered immediately, and this was continued for 7 days as per the COVID-19 infection treatment guidelines from the Taiwan Centers for Disease Control (TW-CDC).[3] On the ninth day of hospitalization, another chest radiography (Fig. 1C) showed improvement over left lung pneumonia patch. The patient also felt subjectively less frequency of coughing and the fever subsided subsequently. On the fifteenth day of hospitalization, the chest radiography revealed resolution of bilateral pneumonia patches (Fig. 1D). After hospitalization for 47 days, the patient was discharged uneventfully with three consecutive negative tests of RT-PCR for SARS-CoV-2.

The co-infection of influenza virus and SARS-CoV-2 is unusual, and to date, most reported cases are from China.[1,2] In real-world practice, some clinicians could be overwhelmed by the outbreak of COVID-19, thus omitting the detection of the influenza virus. In contrast, some clinicians might neglect the possibility of COVID-19 under the circumstances of confirmed influenza infection. Beside co-infection of influenza virus, increased co-infection of other virus or bacteria had also been reported among COVID-19 patients.[4]

In our case, the newly developed dry cough and fever during hospitalization was the warning sign and the subsequent chest image confirmed clinical deterioration, which prompted the initiation of hydroxychloroquine. In March 2020, Gautret et al. first raised the possible role of hydroxychloroquine for treating SARS-CoV-2 by significantly reducing the viral load in COVID-19 patients.[5] However, another randomized study from China reported that hydroxychloroquine did not result in a significantly higher probability of negative conversion than standard of care

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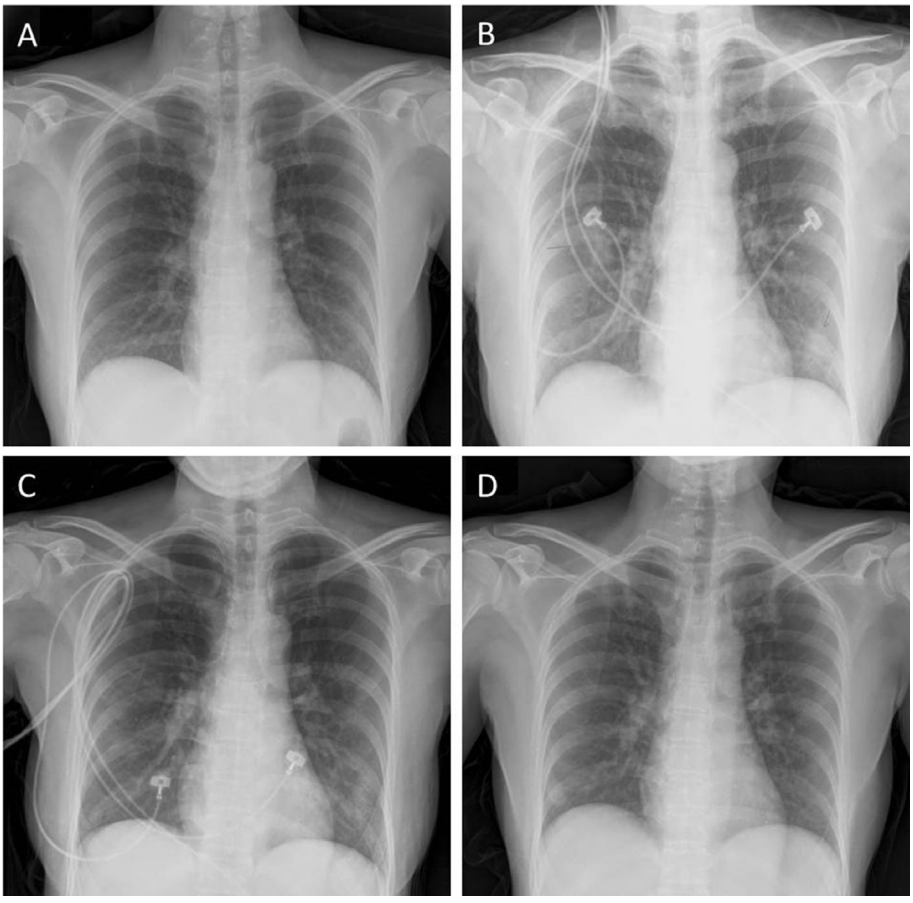

Figure 1. (A) Chest radiograph upon admission, (B) Chest radiograph on day 6, increased infiltrations at bilateral lung. (C) Chest radiograph on day 9, improvement of left lung infiltrations. (D) Chest radiograph on day 15, resolution of bilateral lung infiltrations.

alone. Adverse events were even higher in the hydroxychloroquine group[6] Therefore, clinicians should be cautious in prescribing hydroxychloroquine for the risk may outweigh the benefit in COVID-19 patients.

We changed anti-viral agent from oseltamivir to baloxavir marboxil based on two aspects. The baloxavir marboxil required only single dose of two pills, which increased the patient's compliance of taking medication. Single dose baloxavir marboxil was also superior to oseltamivir in reducing the viral load one day after the initiation of the trial regimen in patients with uncomplicated influenza.[7]

Though sporadic influenza infection can occur outside of the epidemic season, the seasonal distribution of influenza infection is mainly in the autumn and winter in Taiwan. Therefore, the arrival of the seasonal influenza in the near future may coincide with the ongoing outbreak of the novel coronavirus. Clinicians should be vigilant in detecting the coinfection of these two entities and further studies are needed to elucidate the clinical characteristics and outcome of coinfection of SARS-CoV-2 and influenza virus.

Declarations of Competing Interest

No conflict of interest needs to be declared.

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