


## LETTER TO THE EDITOR

**Clinical-scientific note****Tocilizumab alleviates cytokine storm with acute respiratory distress syndrome in severe SARS-CoV-2 infection in Taiwan**

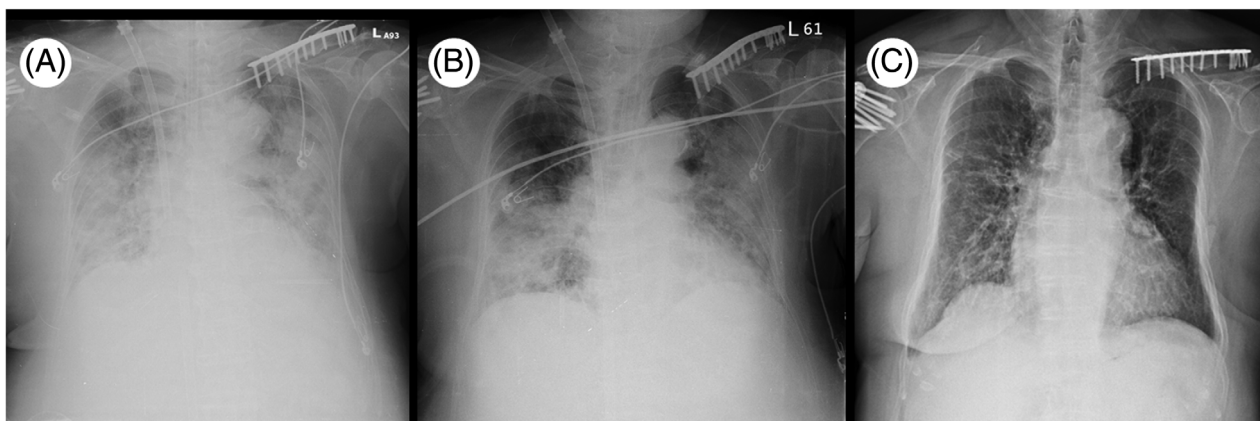
The coronavirus disease-2019 (COVID-19) is a catastrophic state involving various organs mediated by massive sequential proinflammatory cytokines. The pathophysiology of severe SARS-CoV-2 infection-induced respiratory distress and cytokine release syndrome was similar to the SARS outbreak in 2003. The sequential fulminant cytokine storm results in fatal and permanent damage of vital organs. Serum interleukin (IL)-6 concentration in COVID-19 was proven to have good predictive accuracy for intubation/mortality and oxygen requirement.<sup>1</sup> Therefore, treatment strategies in these critical patients with COVID-19 should combine adequate antibiotics and anti-cytokine therapy simultaneously,<sup>2,3</sup> although the effect of IL-6 blockade or Janus kinase inhibitor for COVID-19 is still inconclusive.<sup>4-6</sup> In real-world clinical practice, we had a successful experience in the use of tocilizumab (a monoclonal antibody to IL-6 receptor) in one critical and catastrophically ill Taiwanese female patient who suffered from a severe SARS-CoV-2 infection with a high serum level of IL-6.

A 75-year-old Taiwanese woman travelled to South America and Europe and was quarantined in hospital due to being confirmed positive for SARS-CoV-2 infection. Unfortunately, rapidly progressive dyspnoea with unstable haemodynamics ensued within a few days that prompted endotracheal intubation, mechanical ventilation and venovenous-extracorporeal membrane oxygenation (VV-ECMO). Broad spectrum antibiotics were given. However, bilateral pulmonary consolidation occurred (Fig. 1A) with deteriorating hypoxaemia resulting in acute respiratory distress syndrome. Serum IL-6 concentration revealed was four times normal and we administered tocilizumab 8 mg/kg intravenously. Amazingly, the respiratory distress and shock dramatically improved, as evidenced by clearing of the radiological consolidation (Fig. 1B) and improvement in hypoxia 24 h thereafter. Two to three weeks later, she was successfully extubated and weaned successfully from VV-ECMO and was discharged from hospital (Fig. 1C).

Received 19 March 2021; accepted 14 April 2021.

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**Figure 1** Before tocilizumab use, chest X-ray (A) showed diffuse infiltration and consolidation of bilateral lung field. After tocilizumab treatment, chest X-ray (B) and hypoxia significantly improved within 1 day, as well as after (C) weaning successfully from venovenous-extracorporeal membrane oxygenation and ventilator support 2–3 weeks later.

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