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## Comorbidities and multi-organ injuries in the treatment of COVID-19

"We now have a name for the disease caused by coronavirus and it's COVID-19", said Dr Tedros Adhanom Ghebreyesus, Director-General of WHO on Feb 11, 2020.<sup>1</sup> WHO recently updated the name novel coronavirus pneumonia, previously named by Chinese scientists,<sup>2</sup> to coronavirus disease 2019 (COVID-19).

More attention should be paid to comorbidities in the treatment of COVID-19. In the literature, COVID-19 is characterised by the symptoms of viral pneumonia such as fever, fatigue, dry cough, and lymphopenia. Many of the older patients who become severely ill have evidence of underlying illness such as cardiovascular disease, liver disease, kidney disease, or malignant tumours.<sup>3-5</sup> These patients often die of their original comorbidities; we therefore need to accurately evaluate all original comorbidities of individuals with COVID-19. In addition to the risk of group transmission of an infectious disease, we should pay full attention to the treatment of the original comorbidities of the individual while treating pneumonia, especially in older patients with serious comorbid conditions. Not only capable of causing pneumonia, COVID-19 may also cause damage to other organs such as the heart, the liver, and the kidneys, as well as to organ systems such as the blood and the immune system.<sup>3-5</sup> Patients eventually die of multiple organ failure, shock, acute respiratory distress syndrome, heart failure, arrhythmias, and renal failure.<sup>5,6</sup> We should therefore pay attention to potential multi-organ injuries and the protection and prevention thereof in the treatment of COVID-19.

We took over a ward for the centralised treatment of severely ill patients in Wuhan Tongji Hospital. 60 patients were classified into

three types during their treatment. 13 [22%] of 60 patients mainly had pneumonia and were classified as type A. Basic treatments were provided, such as antivirals, antibiotics, oxygen therapy, and glucocorticoids. 33 (55%) of 60 patients were type B, with disease that manifested with different degrees of pneumonia, accompanied by serious comorbidities. For patients classified as type B, we continued to monitor the changes of comorbidities while managing the pneumonia, carrying out individual evaluations and developing specific treatment plans, including antihypertensives, hypoglycaemic therapy, and continuous renal replacement therapy. 14 (23%) of 60 patients were critically ill and were classified as type C. Patients classified as type C had disease that was considered to have developed from the aggravation of disease seen either in type A or type B, when early therapeutic effects for type A disease were unsatisfactory (resulting in multiple organ injuries), or when disease associated with type B became aggravated and the patient's condition deteriorated from their original comorbidities (leading to multiple organ failure). Attention should be paid to organ function in these critically ill patients and necessary protective measures, including mechanical ventilation, glucocorticoids, antivirals, symptomatic treatments, and anti-shock therapy.

We believe that the classification of COVID-19 in severe patients could help in individual evaluation of the disease and would provide effective triage for the treatment and management of individual patients.

We declare no competing interests.

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