

Treatment to prevent the development of severe COVID-19

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The respiratory virus infection COVID-19 caused by the new coronavirus SARS-CoV2 has been reported in China since December 2019. It has been reported that COVID-19 tends to be more severe in the elderly and in patients with underlying diseases including diabetes, heart disease, and chronic lung disease. In severe cases, patients require intensive cares including mechanical ventilation in the ICUs. So far, no biomarker that predicts the severity, or no therapeutic strategies to prevent the development of severe diseases has been established. Pathology of severe COVID-19 has two aspects: viral overgrowth and excess pulmonary inflammation. For the former, clinical trials using existing drugs such as remdesivir (nucleic acid drug), lopinavir/ritonavir combination drug (protease inhibitor), favipravir (polymerase inhibitor), and interferon (antiviral drugs) are being conducted in patients with severe COVID-19 in China. Furthermore the interest has been focused on immune globulin preparations enriched with pathogen-specific antibodies collected from the plasma of recovered patients. For the latter, clinical studies using tocilizumab (IL-6 receptor antibody) and ACE2 protein have been conducted with the purpose of reducing excessive inflammation of the lung. In addition, single cell analysis of immune cells and comprehensive repertoire analysis of TCR/BCR using patient blood are in progress overseas, which are useful to elucidate the mechanism of the severe disease progression and identify the useful biomarkers for it.