

Multiple drugs

COVID-19 pneumonia: 4 case reports

In a retrospective study, 4 patients including 3 men and 1 woman [aged 59-90 years] were described who developed COVID-19 pneumonia during treatment with prednisone, rituximab, immune-globulin, cyclophosphamide or unspecified steroids.

Patient 1: A 59-year-old man, who was diagnosed with warm autoimmune hemolytic anaemia (wAIHA) in the year 2018, had been receiving treatment with prednisone (steroids) and experimental phosphoinositide 3-kinase inhibitor therapy, with complete response. He had previously received unspecified steroids and rituximab. He had a significant history of hypertension, asthma and obesity. On 22 March 2020, he was admitted to a local hospital due to fever and dyspnoea. He was subsequently diagnosed with bilateral COVID-19 pneumonia by real-time reverse-transcriptase-polymerase chain reaction (RT-PCR) test of nasopharyngeal swabs. Subsequent CT scan confirmed the diagnosis of COVID-19 pneumonia. Following the diagnosis of COVID-19 pneumonia, his phosphoinositide 3-kinase inhibitor was discontinued. At the same time, the dose of prednisone was increased. Additionally, he started receiving off-label treatment with hydroxychloroquine, tocilizumab, darunavir and unspecified steroids for COVID-19 pneumonia. After 1 week, due to worsening of respiratory distress, he was transferred to ICU and intubated. He received low molecular weight heparin (LMWH) for prophylaxis and several antibiotics including ampicillin, meropenem, imipenem and linezolid for suspected superimposed bacterial infection. His condition improved following the corrective measures. On 8 April 2020, he was extubated and transferred to sub-intensive care unit (SICU) and shifted to low-flow oxygen support. Thereafter, gentamicin and vancomycin therapy were initiated due to *Enterococcus faecalis* hospital-acquired septicemia. After the resolution of pneumonia, he developed an acute bilateral flaccid paraparesis of lower limbs. Then, based on the further clinical investigation, he was diagnosed with dysimmune encephalitis secondary to COVID-19 infection. Hence, high-dose IV immune-globulin therapy was initiated. His symptoms gradually improved. His COVID-19 infection resolved. After 122 days of hospitalisation, he was discharged from the hospital.

Patient 2: A 90-year-old man, who was diagnosed with immune thrombocytopenia (ITP) in the year 2011, was successfully treated with unspecified steroids and IV immune-globulin. He achieved persistent remission since 2013. However, on 5 March 2020, he was admitted due to relapsed ITP. He received unspecified steroids and IV immune-globulin, with complete remission of the disease. Then, he was discharged from the hospital. However, on 24 March 2020, he was re-admitted to SICU where bilateral COVID-19 pneumonia (probably contracted during the previous admission) was diagnosed by real-time reverse-transcriptase-polymerase chain reaction (RT-PCR) test of nasopharyngeal swabs. He subsequently started receiving off-label treatment with hydroxychloroquine and continuing full-dose steroids. Additionally, he received full-dose low molecular weight heparin (LMWH). Following the corrective measure, COVID-19 pneumonia resolved. His steroid dose gradually tapered, with persistent ITP remission. Subsequently, he was transferred to the general medicine ward. Then, he received several antibiotics for hospital acquired bacterial pneumonia. However, he was found to have methicillin-sensitive *Staphylococcus aureus* septicaemia infection. Eventually, he was died due to multi-organ failure.

Patient 3: A 78-year-old man, who was diagnosed with relapsed/refractory Evans syndrome in the year 2010, had been receiving treatment with unspecified steroids and experimental spleen tyrosine kinase inhibitor for relapsed autoimmune hemolytic anaemia (AIHA) following the enrolment into clinical trial in August 2019. He had previously received various cycles of unspecified steroids, IV immune-globulin, 2 cycles of rituximab and cyclophosphamide. He had a significant history of arterial hypertension, myocardial infarction, ventricular fibrillation, stroke, two septic shocks and osteonecrosis of the femoral head. He exhibited COVID-19 symptoms including fever, dyspnea and desaturation to 80%. On 25 March 2020, he was diagnosed with COVID-19 pneumonia by real-time reverse-transcriptase-polymerase chain reaction (RT-PCR) test of nasopharyngeal swabs. His experimental therapy with spleen tyrosine kinase inhibitor was discontinued. Then, he was admitted to the internal medicine ward. He subsequently started receiving off-label treatment with hydroxychloroquine, azithromycin and unspecified steroids. Additionally, he required low flow of oxygen support, full-dose low molecular weight heparin (LMWH) and empirical antibiotic therapy for superimposed bacterial infection. Following the treatment, he rapidly recovered from COVID-19 pneumonia. However, he developed two complications including paroxysmal atrial fibrillation, requiring amiodarone, and relapsed warm autoimmune hemolytic anaemia (wAIHA), requiring immune-globulin and full-dose prednisone for 3 weeks followed by slow tapering. Thereafter, he was discharge from the hospital. On 22 June 2020, his treatment spleen tyrosine kinase inhibitor was re-initiated, with complete resolution of AIHA.

Patient 4: A 71-year-old woman, who was diagnosed with cold agglutinin disease (CID) in the year 2015, had been receiving treatment with unspecified steroids. She had previously received unspecified steroids and rituximab, with complete response. She had a significant history of hypertension and osteoporosis. On 21 March 2020, she was admitted to the internal medicine ward of a local hospital with typical features of SARS-CoV-2 pneumonia and CAD relapse (Hb 5.5 g/dL). She was subsequently diagnosed with COVID-19 pneumonia by real-time reverse-transcriptase-polymerase chain reaction (RT-PCR) test of nasopharyngeal swabs. She received transfusions and full-dose steroids for relapsed CAD. Additionally, she received off-label treatment with hydroxychloroquine, azithromycin, lopinavir/ritonavir and ceftriaxone for superimposed bacterial pneumonia. Additionally, she required high flow of oxygen support. After 4 weeks, she was discharged with Hb 9.6 g/dL. Her haemoglobin level rapidly improved led to quick tapering of steroids dose. Her COVID-19 infection and cold agglutinin disease resolved.