Dexamethasone/prednisone/rituximab

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Prolonged SARS-CoV-2 infection and off-label use: case report

A 51-year-old man developed prolonged SARS-CoV-2 infection during the treatment with rituximab and off-label dexamethasone and prednisone for non-hodgkin lymphoma and COVID-19 respectively [*not all dosages stated; routes not stated; durations of treatments to reactions onset not stated*].

The man had medical history of non-hodgkin lymphoma presented to his doctor with fever and was hospitalised on 7 September 2020. He was treated with rituximab which had last been administered in June 2020. His SARS-CoV-2 polymerase chain reaction (PCR) performed on a nasopharyngeal swab was found to be positive, confirming the diagnosis of COVID-19. After 12 days of admission, he experienced high fever and hypoxia. More than 10 days had passed since the onset, his symptoms were thought to be organising pneumonia. He received off-label dexamethasone 6 mg/day. Temporarily, he required 8L of oxygen, but after starting dexamethasone therapy his fever and respiratory status improved. After ten days of dexamethasone initiation, there was still demand for oxygen, so off-label prednisone 40mg per day was started as an organised pneumonia after COVID-19 infection. His prednisone dose was reduced to 30mg per day and he was discharged from hospital on 24 October 2020. However, after five days of discharge, he was readmitted because of recurrence of fever. When his prednisone dose was increased to more than 35mg per day his fever declined, but with lower doses, the fever remerged. Additionally, during the three months of treatment, his SARS-CoV-2 PCR test of nasopharyngeal swabs was remained positive.

Then the man was transferred to the hospital in Japan on 30 November 2020 for further treatment. He reported no fever on admission on a dose of 35mg of prednisone per day. Long term use of corticosteroids (prednisone and dexamethasone) may be delaying clearance of SARS-CoV-2 virus, so prednisone reduced to 20mg per day. On 9 December 2020, he was discharged and no symptoms. In order to determine the amount of active virus, sputum sample and nasopharyngeal swab was performed for viral testing. However, the day after discharge, he experienced fever again and was readmitted to the hospital on 6 December 2020. Viral isolation testing showed viable virus in both the sputum samples and nasopharyngeal swab from the previous admission. Therefore, in order to reduce the amount of virus, he received remdesivir for ten days. On 24 December 2020, PCR testing of nasopharyngeal swab was negative. He was discharged on 28 December 2020. On 19 January 2020, he returned to the hospital with SARS-CoV-2 PCR test of a nasopharyngeal swab and viral culture were positive and anosmia. The SARS-CoV-2 whole-genome viral sequencing of virus isolated from sputum specimens collected on 3 December 2020 (during the first admission to our hospital) and on 19 January 2021. Based on these results, we concluded that viral isolates had the same mutation in common indicating persistent infection with the same viral strain rather than reinfection. After a week, PCR test was negative. Rituximab last administrated in June 2020. The rituximab effect was thought to last about six months, so rituximab effect had worn off and that his humoral immunity had recovered and cleared the virus. However, he developed rituximab, dexamethasone and prednisone induced prolonged SARS-CoV-2 infection. Then, the dose of prednisone was tapered. On 23 February 2021, he discontinued dexamethasone and prednisone. At seven months of follow-up, he did not experience any subsequent relapses and did not require any steroids.

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