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Letter to the Editor

LETTER TO THE EDITOR

128 days of SARS-CoV-2 viral shedding in a haemodialysis patient

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Haemodialysis patients face an exceptional risk in the current coronavirus disease 2019 (COVID-19) pandemic. Stringent infection control measures prevent transmission among patients at haemodialysis centres, but many questions remain, including the duration of cohort dialysis isolation for COVID-19-positive patients. Here we describe a case of prolonged viral shedding in a haemodialysis patient and the difficulties associated with in-centre care when confronted with this exceptional long duration.

A 77-year-old haemodialysis patient with persistent cough and increased C-reactive protein (CRP) tested positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by reverse transcription polymerase chain reaction (RT-PCR) on nasopharyngeal swab in our hospital on day 0. She initiated haemodialysis in 2013, after acute kidney injury from anti-glomerular basement membrane disease. Her medical history includes chronic obstructive pulmonary disorder, for which she was treated with methylprednisolone 4 mg/day, paroxysmal ventricular fibrillation and heart failure. In 2018 she was diagnosed with lung cancer, for which she was treated with radiotherapy. Her condition before the diagnosis of COVID-19 was stable, with mild chronic respiratory symptoms and persistently mildly increased CRP and mild lymphopenia ($0.4–0.6\times10^3/\mu L$) for years. This deteriorated in the 2 weeks preceding, and presumably as a result of, the diagnosis of COVID-19.

In our institution, COVID-19-positive haemodialysis patients are treated in a separate ward and institutional group transport is changed to personal transport. Frequency is reduced to twice weekly if possible. At that time, our policy was to stop the haemodialysis in cohort isolation after 2 weeks without repeated PCR testing, unless the patient was still symptomatic. Because of persistent cough, we repeated PCR testing 3 weeks later. This test came out positive again. Nasopharyngeal swabs were repeated almost every other week, but remained positive (Figure 1A). Her symptoms also persisted, although her underlying respiratory disorder complicated this interpretation. Her glucocorticoid dose was continued as before and never increased. Total SARS-CoV-2 antibodies were determined by enzyme-link immunosorbent assay (Elecsys Anti-SARS-CoV-2 immunoassay, Roche Diagnostics, Mannheim, Germany) and had a 90.6 cutoff index (COI) on day 49. Given the increased viral load in July and the high emotional burden of prolonged isolation during haemodialysis, a nasopharyngeal swab was sent out for viral culture on day 116. However, a PCR turned negative and viral culture was never performed. To confirm negativity, PCR test was repeated 1 week later but turned positive again (128 days since diagnosis). Two subsequent tests in the next weeks remained, negative and we considered her as definite negative since. SARS-CoV-2 antibodies remained stable (81.2 COI on day 144). Nevertheless, dyspnea and cough did not resolve, CRP levels never normalized and lymphopenia persisted (Figure 1B). Chest X-ray 144 days after diagnosis showed persistent infiltrates. Her clinical condition deteriorated and she died 159 days after diagnosis. Genome sequencing of the respiratory specimens from day 0 and day 112 confirmed viral shedding of an identical SARS-CoV-2 strain.

The median duration of viral shedding of SARS-CoV-2 is 20 days [1, 2], but cases of ≥80 days have been reported [3, 4]. Factors reported to be associated with prolonged viral shedding

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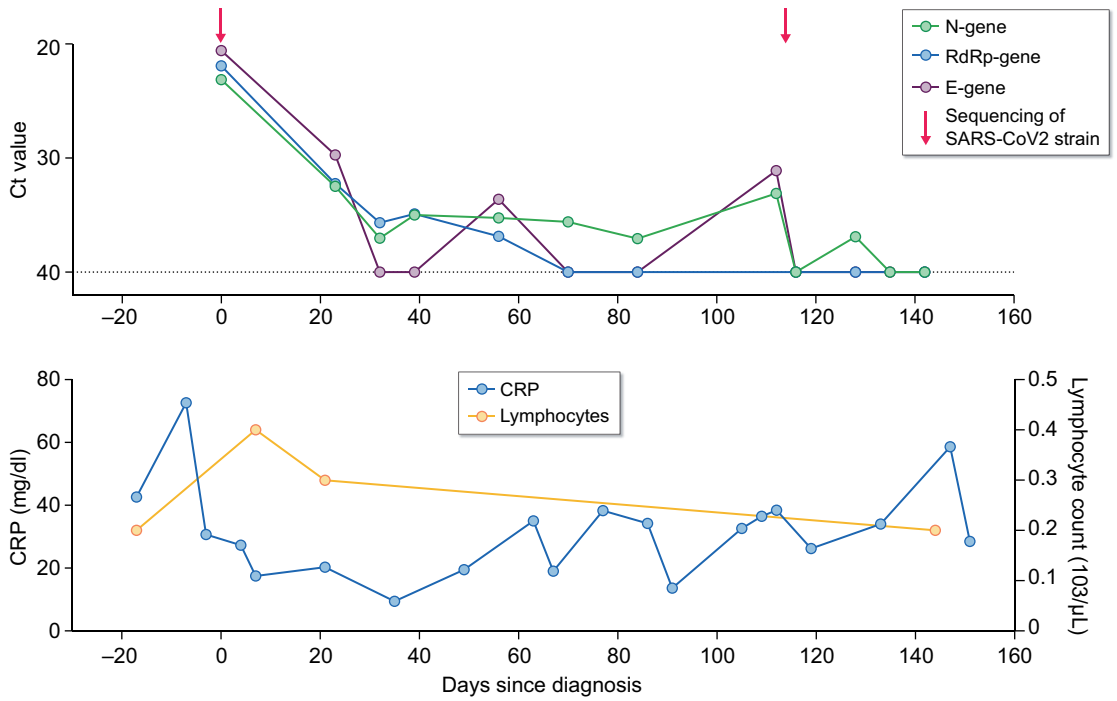

FIGURE 1: Timeline of (A) the cycle threshold (Ct) values from the SARS-CoV-2 target sequences, including the envelope (E), nucleocapsid (N) and RNA-dependent RNA polymerase (RdRp) genes. The horizontal dashed line represents the cutoff for positivity at 40. The arrows indicate the timing of genome sequencing of the respiratory specimens from day 0 and day 112 to confirm viral shedding of an identical SARS-CoV-2 strain. Timeline of (B) CRP levels and lymphocyte counts from diagnosis until death. In the 2 weeks before diagnosis, the patients symptoms deteriorated, CRP levels increased and lymphopenia reached a nadir, but her previous condition complicated clinical interpretation and diagnosis.

are: male sex, old age, concomitant hypertension, corticosteroid treatment and severe COVID-19 disease [1, 2, 5]. A recent preprint describes 105 days of genomic RNA detectable on a nasopharyngeal swab, but this was explained by hypogammaglobulineamia from cancer that prevented the patient from developing antibodies and thus clearing the infection [6], while our patient did develop antibodies and still remained positive. Another recent case report describes 151 days of SARS-CoV-2 RT-PCR positivity despite intermittent clearance and negative RT-PCR tests, but this patient was heavily immunocompromised with cyclophosphamide, rituximab and glucocorticoids [7].

Despite persistent viral shedding, several studies have demonstrated that infectivity decreases much earlier [8, 9]. Nevertheless, faced with the uncertainties of a new virus and pandemic, we considered any risk of transmission due to transport and ward sharing among the in-centre haemodialysis patients as unacceptable and considered her only as definite negative after the two subsequent negative tests. Moreover, infectious virus could be demonstrated in nasopharyngeal samples up to day 143 in the above mentioned case report of an immunocompromised patient [7].

This case report demonstrates the complicated course of COVID-19 in a haemodialysis patient with an exceptionally long duration of viral shedding and the difficult policy decisions associated with her in-centre care.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest. The results presented in this paper have not been published previously in whole or part.

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