

## CASE REPORT

# Lupus nephritis flare post Moderna mRNA-1273 coronavirus vaccine

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**Learning point for clinicians**

mRNA-based coronavirus vaccines are largely safe and can induce a robust immune response in the host. In systemic autoimmune disorders, it is possible that the vaccine-induced response can cause flare-ups. Going forward, it is essential that there is an index of suspicion to identify and treat these flare-ups in high-risk cases.

**Introduction**

More than 7 billion doses of coronavirus vaccines have been administered worldwide. They have overall been very safe, but there are sporadic cases of adverse events. We describe a case of systemic lupus erythematosus flare after the mRNA-1273 Moderna vaccine that improved with treatment. *De novo* glomerulonephritis and flare-ups have been described after the coronavirus vaccines.

**Case report**

A 30-year-old African American male with a known history of lupus nephritis (WHO Class 2 and 5 in 2019) presented with fevers, weakness and abnormal labs 3 days after receiving one dose of mRNA-1273 vaccine. Weakness and chills began 24 h post-vaccination. Temperature was 103.3 F on presentation with stable hemodynamics. Symptoms also included generalized arthralgia and a headache. Initial labs showed a creatinine of 2.81 mg/dl, normal electrolytes, WBC count 3.3 k/mm<sup>3</sup>, 12 g proteinuria and trace hematuria. C3 was low at 77 (normal is 90–200) and dsDNA positive.

Four days earlier in the office, creatinine was 0.79 mg/dl. C3 was 101.7, 9 months earlier. He did have a mild COVID-19

infection 6 months prior which resolved within a week with symptomatic over the counter treatment.

Maintenance therapy for lupus nephritis included mycophenolate mofetil 1500 mg bid, hydroxychloroquine and 5 mg prednisone.

Blood and urine culture was negative. Despite intravenous hydration, creatinine went up to 3.19 g/dl the next day. Pulse dose solumedrol (500 mg intravenously × 3 days) was initiated and then switched to 60 mg prednisone. Five days later, creatinine was down to 1.7 mg/dl and fevers resolved. Due to recent history of pulmonary embolism, he was on coumadin. Kidney biopsy was initially held due to a therapeutic INR and coumadin was held. Once INR was normal and while on a heparin bridge, he declined a kidney biopsy as renal function was improving with treatment. He had a history of a hematoma needing a blood transfusion with his initial kidney biopsy which also was a reason for him to decline a kidney biopsy. AKI, low c3, symptoms, dsDNA positivity and negative infectious workup clinically correlate with a lupus nephritis flare. Prompt treatment helped improve parameters with C3 coming up to 86, 5 days after steroid initiation along with symptomatic improvement. He was discharged on 60 mg oral prednisone with a plan to taper. Mycophenolate mofetil was continued as before.

One month later, creatinine was down to 1.1 mg/dl, C3 within normal range, WBC at 7700/mm<sup>3</sup> and dsDNA negative. Prednisone was down to 40 mg. Urinalysis was negative for proteinuria and hematuria. Second dose of the COVID vaccine had not yet been administered per recommendations from rheumatology. Plan is to gradually taper prednisone.

**Discussion**

Studies show that coronavirus vaccines are largely safe in underlying rheumatological disease.<sup>1</sup> There are rare cases being reported of *de novo* glomerulonephritis<sup>2</sup> and glomerulonephritis

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flares<sup>3</sup> after the coronavirus vaccine. Prior COVID illness is a risk for vasculitis flares after vaccination.<sup>4</sup> Data are still limited to prove definitive causation, but further research is needed as more cases are being reported. With more coronavirus vaccines being administered worldwide and recommendations for booster shots in immunocompromised individuals, there is potential for more associations with vasculitis flares. To the best of our knowledge, there are only two cases of lupus nephritis flare-ups after the coronavirus vaccine.<sup>5,6</sup> Early diagnosis and treatment led to a quick improvement in renal function in our case. Further research is needed regarding routine surveillance post-vaccination in autoimmune disease, especially in those with prior COVID-19 infection. Surveillance could include laboratory testing or serologic markers specific to the underlying vasculitis.

*Conflict of interest.* None declared.

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