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Letter to the Editor

Systemic Lupus Erythematosus Following COVID-19 Vaccination

Anna Farazilah Mohd Salleh, Cheng Lay Teh, Sharifah Aishah Wan Mohamad Akbar, Yaw Kiet Cheong, Benjamin Sachdev Manjit Singh, Kar Hoo Lee, Wendy Wan Hui Lee, Sivaraj Xaviar, Mohammad Amirul Shahril Ahmad

In the global fight against COVID-19, the concern regarding autoimmunity arises with the advent of SARS-COV-2 vaccines. Par for the course, mass vaccination initiatives with SARS-CoV-2 vaccines have revealed rare yet serious adverse events, such as thrombosis-thrombocytopenia syndrome and even myocarditis. These adverse events are postulated to be autoimmune-related, but cases linking SARS-CoV-2 vaccines with systemic lupus erythematosus (SLE) have yet to be reported. Here, we report a patient diagnosed with SLE following Pfizer-BioNTech COVID-19 vaccination. This case highlights a potential risk of autoimmunity following vaccination with mRNA vaccines.

We describe a lady in her late 40s with a history of hypertension and dyslipidemia, who presented with skin rash in the lower extremities 2 weeks after receiving the first Pfizer-BioNTech vaccine dose in March 2021. The rash progressed to affect the face and upper extremities a day after completing the second dose in April 2021. This time, the skin rash was accompanied by generalized weakness which prompted her admission to another medical center.

On examination, there was proximal myopathy with CK of 2086 U/L which initially led to a diagnosis of dermatomyositis. She was treated with 2 doses of IV methylprednisolone 500 mg before she was discharged with prednisolone 45 mg daily. Unfortunately, 5 days later she presented to our hospital with worsening weakness. A diagnosis of SLE was made when, on further assessment, she was found to have an oral ulcer, a typical malar rash that spared the nasolabial folds, and vasculitic lesions on the palms. In our center, a third dose of methylprednisolone 500 mg was prescribed along with IV immunoglobulin 27 g (0.4 g/kg/day) for 5 days.

The results of laboratory evaluation which supported the diagnosis of SLE are as follows: ANA 1:640 (homogenous pattern); dsDNA 800 IU/mL (30-75 IU/mL); complement C3 41 mg/dL (90-180 mg/dL) and C4 4 mg/dL (10-40 mg/dL); IgG 22.18 g/L (7-16) and IgE 377 (<101); and moderately raised anticardiolipin antibody 35.4 GPL. In addition, immunofluorescent studies on skin biopsy showed IgA (2+) and C1q (2+), IgM (1+), IgG (1+ high background), and C3 deposits along the dermal-epidermal junction. She had no hematologic, serosal, renal, or neuropsychiatric involvement and SARS-CoV-2 PCR was negative. Additionally, there is no history of autoimmunity in her family.

Over the first 48 hours, the mucocutaneous and proximal myopathy had resolved. She was eventually allowed home with hydroxychloroquine 200 mg and prednisolone 20 mg daily.

Vaccine-associated autoimmune disease is a known phenomenon explained by molecular mimicry, adjuvants, and genetic predisposition.[1] However, the association between conventional vaccination and the onset of SLE or lupus-like syndromes is temporal at best.[2] Nevertheless, the same concern arises in the advent of mRNA COVID-19 vaccines.

Studies have shown that SLE and SARS-CoV-2 share type I interferon and proinflammatory cytokine pathways which could potentiate immune responses to SARS-CoV-2 vaccines while triggering previously stable SLE and perhaps expose de novo autoimmune disease in those who are susceptible.[3,4] For this reason, although our case reveals a seemingly temporal relationship between SLE onset and SARS-CoV-2 vaccination, we cannot confidently preclude underlying autoimmune susceptibility in our patient.

ORCID iDs of the authors:
A.F.M.S. 0000-0003-3901-965X,
C.L.T. 0000-0001-7897-3994,
S.A.W.M.A. 0000-0002-4700-0951,
Y.K.C. 0000-0002-6130-4169,
B.S.M.S. 0000-0002-0978-8602,
K.H.L. 0000-0001-5015-628X,
W.W.H.L. 0000-0002-4452-0521,
S.X. 0000-0002-8058-2682,
M.A.S.A. 0000-0002-4504-9014.

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Department of Medicine, Rheumatology Unit, Sarawak General Hospital, Malaysia

Corresponding author:
Anna Farazilah Mohd Salleh
E-mail: halizaraf@hotmail.com

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Concerns regarding vaccine triggering SLE have been discussed in length by Mason et al.[5] Hepatitis B vaccine has been shown to be temporally associated with SLE in a retrospective study.[6] However, an international case–control did not show an association between any vaccine and the onset of SLE.[7]

To the extent of our knowledge, our case is the first report of SLE diagnosed following the novel mRNA Pfizer-BioNTech COVID-19 vaccine. As our experience concerning mRNA vaccines continues to grow, it remains pertinent that more clinical studies are conducted to ascertain a causal relationship to autoimmune disease. Meanwhile, in light of the ongoing mass vaccination initiatives, physicians should be vigilant of this potential association.

Nonetheless, it is recommended that SLE patients, who are at higher risk of hospitalization and death from COVID-19, should receive COVID-19 vaccines with its timing tailored to the individual patient's immunotherapy and disease activity.[3,5] A guidance on the use of the COVID-19 vaccine in patients with rheumatic diseases has been published by The American College of Rheumatology COVID-19 Vaccine Clinical Guidance Task Force.[8]

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