Dermatomyositis following COVID-19 vaccination

TK Kong *

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A 59-year-old Chinese woman, a workman with hypertension and non-smoking history, sought medical advice in April 2024 for a 16-month history of progressive weight loss, reduced appetite, proximal myalgia, arthralgia of the hands, abdominal discomfort and constipation since February 2023; and a 10-month history of dry cough and exertional dyspnoea. She had received four Comirnaty messenger ribonucleic acid coronavirus disease 2019 (COVID-19) vaccinations (Pfizer-BioNTech; Pfizer Inc, Philadelphia [PA], United States) between 8 July 2021 and 12 January 2023 and had two COVID-19 infections, one each in March 2022 and June 2023. She carried the beta thalassaemia trait, as did her father. Both her parents had lung cancer.

Investigations in January 2024 revealed raised carcinoembryonic antigen level (11.4 ug/L; reference range, <5.0); negative stool for occult blood; negative sputum for acid-fast bacilli smear/culture and positive anti–nuclear antigen antibodies (1:160). Whole-body positron emission tomography–computed tomography in January 2024 revealed patchy ground-glass opacities and fibrosis with mild ^{18}F-fluorodeoxyglucose uptake in the lower lobes of the lungs, but no hypermetabolic lesion to suggest malignancy. Twelve days prior to consultation she had been hospitalised for dizziness and found to have a low haemoglobin level (6.7 g/dL). She was transfused to 8.5 g/dL and discharged the next day.

When seen at the clinic in April 2024, the patient's body weight was 47.9 kg, compared with 68.2 kg 16 months previously. She expressed difficulty with working and in getting up from bed because of weakness. Physical examination revealed pallor, a rash on her hands suggestive of dermatomyositis (Fig), puffy eyelids without heliotrope rash, and proximal muscle wasting and weakness. Fine end-inspiratory crepitations were heard at the base of the lungs. There was no cervical lymphadenopathy nor palpable abdominal masses. Review showed a serial drop in haemoglobin level (from 10.2 g/dL in February 2023 to 6.7 g/dL in April 2024), increasing microcytosis (decrease in mean corpuscular volume from 63.1 fL in February 2023 to 59.0 fL in April 2024), and iron deficiency in the setting of chronic inflammation. The clinical diagnosis was dermatomyositis with myopathy, interstitial lung disease, and probable colon cancer with iron deficiency anaemia superimposed on beta thalassaemia trait. She was referred to hospital for further management. Muscle enzyme tests revealed normal creatine kinase level (113 U/L) but elevated lactate dehydrogenase (499 U/L) and alanine aminotransferase levels (65 U/L). Myositis antibody screening confirmed the diagnosis of anti–melanoma differentiation–associated protein 5 (anti-MDA5) antibody–positive dermatomyositis.

The patient's illness onset in February 2023 following COVID-19 vaccination the month before suggested a trigger by vaccination, further aggravated by her COVID-19 infection in June 2023. Dermatomyositis, inflammatory myopathy, and rheumatic immune-mediated inflammatory diseases have been reported following COVID-19 vaccination and infection.[1-3] In a systematic review up to May 2023,[3] 24 cases of post–COVID-19 vaccination dermatomyositis were reported worldwide, the majority following vaccination with Pfizer-BioNTech vaccine, and some following that with Moderna and Oxford–AstraZeneca vaccines. Only two such cases were reported among Chinese, one from mainland China (after Sinopharm's inactivated Vero cell),[4] one from Taiwan (after

FIG. Rash on the patient's hands characteristic of dermatomyositis: violaceous plaques over the knuckles and fingers (Gottron papules), periungual erythematous swelling, mechanic's hands with fissuring and hyperkeratosis on the ulnar aspect of the thumbs and radial aspect of the index fingers

Oxford–AstraZeneca),[5] but none from Hong Kong. The close temporal sequence and surge against a background of the reported case series suggest an association between severe acute respiratory syndrome coronavirus 2 infection/vaccination and the development of dermatomyositis, although proof of causality requires further research because of the limited number of cases reported.[1,3] A recent bioinformatic study and transcriptome-derived insights point to a potential causal link between the surge in the Yorkshire region in the United Kingdom between 2020 and 2022 in anti-MDA5–positive dermatomyositis, autoimmune interstitial lung disease and COVID-19.[6] The COVID-19 vaccination and infection may trigger a proinflammatory immune response involving type I interferon and stimulate production of dermatomyositis-specific autoantibodies such as MDA5 that are closely related to viral defence or viral RNA interaction supporting the concept of infection and vaccination-associated dermatomyositis.[1-3,6]

This case demonstrates that dermatomyositis can be induced by COVID-19 vaccination, ignorance of which and of the diagnostic clinical signs would lead to delayed diagnosis and management. Coronavirus disease 2019 vaccines are widely used. When patients present with constitutional symptoms with persistent muscle aches and weakness following COVID-19 vaccination, clinicians should consider dermatomyositis as a differential diagnosis and examine the skin for pathognomonic signs.

Author contributions

The author is solely responsible for the concept or design, acquisition of data, analysis or interpretation of data, drafting of the manuscript, and critical revision of the manuscript for important intellectual content. The author had full access to the data, contributed to the study, approved the final version for publication, and takes responsibility for its accuracy and integrity.

Conflicts of interest

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Ethics approval

The patient was treated in accordance with the Declaration of Helsinki. Patient consent was obtained for clinical photo of her hands and for publication of the article.

TK Kong *, FRCP, FHKAM (Medicine)

Department of Medicine and Therapeutics, Prince of Wales Hospital, The Chinese University of Hong Kong, Hong Kong SAR, China

* Corresponding author: tkkong@cuhk.edu.hk

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