Correspondence

Manifestation of a cancer-associated TIF-1 gamma dermatomyositis after COVID-19 vaccine

Dear Editor,

Reports of vaccine-related adverse events have been growing following the large-scale administration of COVID-19 vaccines, including new onset or flare of an existing autoimmune disease.[1] Postulated theories for the association between vaccination and autoimmunity include molecular mimicry between the host and the vaccine antigen or an adjuvant in the vaccine.[1] Dermatomyositis is an inflammatory myopathy that has rarely been reported after COVID-19 vaccination.[2,3] We herein report a patient who manifested with clinical features of a cancer-associated dermatomyositis following COVID-19 vaccination.

A 44-year-old Chinese male presented to the dermatology clinic for a 6-month duration of facial and body rashes which started 2 weeks after receiving the first dose of Moderna COVID-19 vaccine. These rashes worsened after the second dose of the Moderna vaccine, which was given 4 weeks after the first dose. He also reported photosensitivity and intermittent eyelid swelling. He did not have muscle weakness, weight loss, or other constitutional symptoms. He had a history of eczema without other chronic medical conditions and was not taking any long-term or new medications.

On examination, there were erythematous plaques over the eyelids, glabella, and nasolabial folds (Figure 1a). He had poikilodermatous plaques over the upper back (Figure 1b), erythematous plaques over the metacarpal and interphalangeal joints (Figure 1c), and occasional dilated nailfold capillaries. Skin punch biopsy from the upper back revealed an interface dermatitis with increased dermal mucin (Figure 2a,b). Direct immunofluorescence was negative. Antibodies to TIF-1 gamma were strongly positive (56 units, normal <50 units). Antinuclear

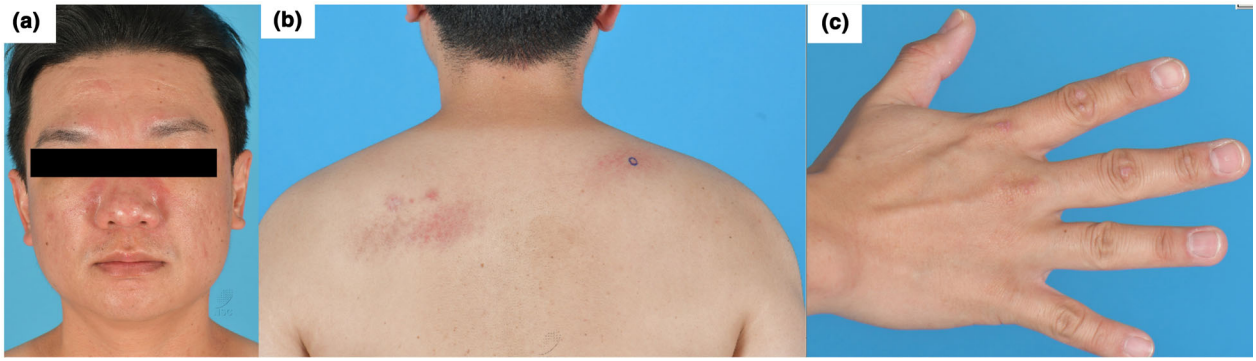

Figure 1 (a) Erythematous plaques over forehead, glabella, and nasolabial folds, (b) poikilodermatous plaques over upper back, and (c) faint erythematous plaques over the metacarpal and interphalangeal joints

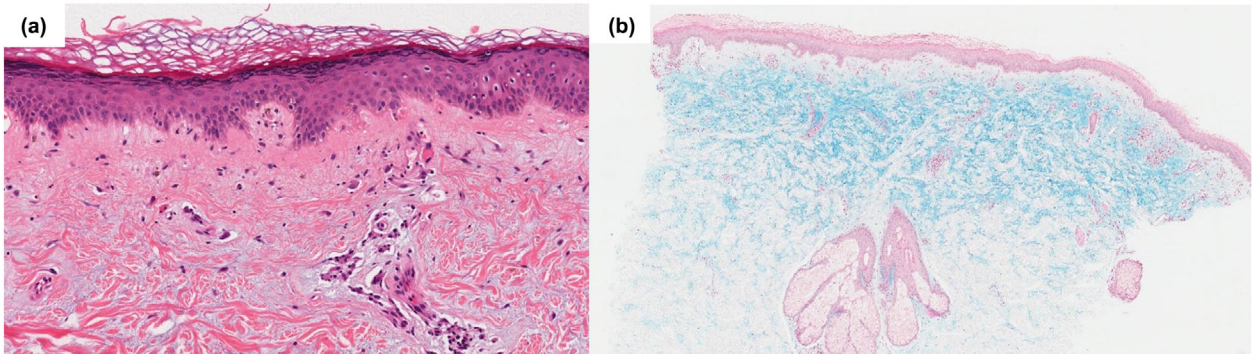

Figure 2 (a) Photomicrograph showing dermal mucin and interface dermatitis with apoptotic keratinocytes and a superficial perivascular lymphocytic infiltrate (hematoxylin–eosin stain, ×200). (b) Alcian blue stain highlighting increased dermal mucin within the upper and mid dermis (Alcian blue, ×40)

antibody, extractable nuclear antigen, creatine kinase, aldolase, and liver enzymes were normal. He was diagnosed with histology-proven nasopharyngeal carcinoma following a paraneoplastic workup and planned to start chemotherapy and radiotherapy. He was also commenced on prednisolone and hydroxychloroquine for his dermatomyositis with an improvement in cutaneous symptoms.

The pathogenesis of dermatomyositis is incompletely understood but thought to be related to the upregulation of type 1 interferons along with antibody and complement activation.[4] In this patient, the preceding COVID-19 vaccination is postulated to have unmasked the cutaneous features of his underlying subclinical cancer-associated dermatomyositis through increasing the activation of toll-like receptors, type 1 interferons, and Th1 and Th2 cell differentiation. The temporal sequence of the skin rashes appearing 2 weeks after the first vaccine dose, and worsening after the second, supports a true association between vaccine administration and rash occurrence. Apart from the unmasking of underlying dermatomyositis, COVID-19 vaccinations have been associated with local skin inflammation in sites of previous Bacillus Calmette-Guérin (BCG) vaccination, radiation-recall dermatitis in previously irradiated skin sites, delayed-type hypersensitivity reactions to dermal fillers, and reactivation of decade-quiescent erythema nodosum.[1,5] These have been postulated to be due to a vaccine-triggered local hypersensitivity reaction around pre-existing subclinical inflammation. Our case report adds to the growing literature supporting the concept of dysregulation or upregulation of T cell immune reaction in a subset of patients receiving COVID-19 vaccinations.

Xue Ting Ooi[1]*, MBBS, MRCP, M. Med (Int. Med)
Ellie CE Choi[1], MBBS, MRCP, M. Med (Int. Med)
Joyce SS Lee[2], MBBS, MRCP, M. Med (Int. Med), FAMS (Dermatology), Dip. Dermatopathology (ICDP-UEMS)

[1]Division of Dermatology, University Medicine Cluster, National University Hospital, Singapore
[2]Dermatology, National Skin Centre, Singapore
*E-mail: xueting.ooi@mohh.com.sg

Conflict of interest: There are no conflicts of interest to declare.

Funding source: There are no sources of funding to declare.

doi: 10.1111/ijd.16358

References

1 Gambichler T, Boms S, Susok L, Dickel H, Finis C, Abu Rached N, et al. Cutaneous findings following COVID-19 vaccination: review of world literature and own experience. *J Eur Acad Dermatol Venereol*. 2022;**36**(2):172–80.
2 Lee AYS, Lee C, Brown DA, Suan D. 'Development of anti-NXP2 dermatomyositis following Comirnaty COVID-19 vaccination'. 2022. (Published online ahead of print). (Accessed 5 July 2022) Available from: https://pmj.bmj.com/content/early/2022/02/06/postgradmedj-2022-141510
3 Yoshida A, Ikegami T, Igawa K. Two cases of anti-TIF1-γ antibody positive dermatomyositis with manifested symptoms after SARS-CoV-19 vaccination. *J Eur Acad Dermatol Venereol*. 2022;**36**(7):e517–20.
4 DeWane ME, Waldman R, Lu J. Dermatomyositis: clinical features and pathogenesis. *J Am Acad Dermatol*. 2020;**82**(2):267–81.
5 Wu X, Lim JHL, Lee JSS, Chio MT-W. Recurrent erythema nodosum after the second dose of the Pfizer-BioNTech BNT162b2 COVID-19 messenger RNA vaccine. *JAAD Int*. 2022;**6**:107–8.