Received: 23 August 2021 | Accepted: 3 November 2021

DOI: 10.1002/ccr3.5092

CASE REPORT

Clinical Case Reports Open Access WILEY

Lichen planus flare following COVID-19 vaccination: A case report

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Funding information
The authors have no funding sources to declare

Abstract

We report the third case of cutaneous lichen planus (LP) following COVID-19 BNT162b2 vaccination in a 59-year-old woman with previous LP. The reactivation of LP in patients with dormant LP suggests a possible vaccine-induced immune dysregulation. We suggest that the already described vaccine-induced upregulation of Th1 response may play a relevant role in LP reactivation, through an increase in inflammatory cytokines involved in the pathogenesis of LP. Interestingly, LP has already been associated with vaccinations and viral infections including COVID-19 disease. However, the exact mechanism underlying LP (re)activation after Pfizer-BiotNtech COVID-19 vaccination is still widely unknown and needs to be further investigated.

KEYWORDS

COVID-19 cutaneous, COVID-19 skin, COVID-19 vaccination, COVID-19 vaccine, lichen planus

1 | INTRODUCTION

To contain the COVID-19 pandemic, vaccines have been developed and are being administered worldwide. The SARS-CoV-2 mRNA vaccine Comirnaty (BNT162b2, BioNTech/Pfizer) is a gene therapy-based vaccine, whose long-term effects are inevitably unknown and need, therefore, to be intensively studied.[1,2]

BNT162b2 vaccine has been described to upregulate Th1-cell response, incrementing inflammatory cytokines involved in the pathogenesis of autoimmune diseases, such as connective tissue diseases, psoriasis, vitiligo, and lichen planus (LP).[1-3]

Currently, only two cases of cutaneous LP following COVID-19 vaccination, one case of oral lichen planus and lichenoid drug eruptions (LDE) have been described.[3,4-6]

2 | CASE PRESENTATION

We report a case of LP following BNT162b2 vaccination in a 59-year-old woman with a past history of LP. Two weeks after the second dose of vaccine, she presented for newly appeared pruritic skin lesions. She reported no mucosal nor nail lesions, recent infections, habit changes, nor other possible triggers.

The authors Astrid Herzum and Martina Burlando contributed equally.

Six years earlier, she presented similar, more generalized, papules, clinically and histologically diagnosed as LP, and effectively treated with topical corticosteroids. Lesions had never recurred.

At physical examination, polygonal, purpuric, scaly, and slightly elevated papules were seen on the medial side of both ankles and feet (Figure 1). Close-up examination and dermatoscopy evidenced fine scales on an erythematous background and Wickham's striae (Figure 2).

Biopsy confirmed the diagnosis of LP, and lesions resolved after three weeks of topical high-potency corticosteroids, with relief of the patient.

3 | DISCUSSION

This is the third case of cutaneous LP following COVID-19 vaccination. In line with literature cases, the patient developing LP recrudescence after COVID-19 vaccination was a woman in her late fifties and was successfully treated only with topical therapy, as the first reported literature case.[3,4]

Of note, LP has already been associated also with COVID-19 infection, other viral infections, and anti-viral vaccinations. HBV vaccination is the most frequently associated with LP and the first reported one, in 1990, followed by influenza and herpes zoster vaccines.[3,7-9]

LP and LDEs occur uncommonly after anti-viral vaccinations and, as in LP cases after COVID-vaccine, mainly affect middle-aged women, reflecting the increased risk of autoimmunity in adult females.[9]

The pathogenesis of LP triggered by anti-viral vaccines is not fully understood. Activated auto-cytotoxic CD8 T lymphocytes induce death due to basal keratinocytes and increase in inflammatory cytokines, such as IL-5 and IFN-γ, and finally LP.[9]

FIGURE 1 Erythematous to violaceous, scaly, and polygonal papules of the right foot

FIGURE 2 Close up of lichen planus papules showing typical Wickham's striae and scales on an erythematous background

Regarding the specific case of the COVID-19 vaccine, only three associated LP cases, comprising ours, have been reported up to date. The association must be, therefore, considered as possibly just casual.

However, the present case and the first literature case evidenced LP reactivation in patients with dormant LP, possibly triggered by the vaccine. This supports the thesis that vaccine-induced immune dysregulation may reactivate LP, if not completely induce it.

Indeed, it has been reported that the BNT162b2 vaccine induces upregulation of Th1 response, which increases the levels of IL-2, IFN-γ, and TNFα, commonly known for being inflammatory cytokines directly involved in the pathogenesis of LP.[1,10] However, the possible mechanism underlying LP (re)activation after Pfizer-BiotNtech COVID-19 vaccination is still widely unknown and needs to be further investigated.

In conclusion, it is important to stress that LP lesions, reported in association with COVID-19 vaccination, are benign, are successfully cured with topical therapy, and do not represent by any means a reason not to undergo COVID-19 vaccination. Nonetheless, dermatologists should be aware of this and all other possible cutaneous reactions associated with the COVID-19 vaccine, to promptly recognize and, if needed, treat them, minimizing the discomfort of the patients and thereby encouraging the population to undergo vaccination.[11, 12] Lastly, we highlight the importance of reporting adverse reactions,

in order to promote vaccine safety through pharmacovigilance systems.

ACKNOWLEDGMENTS

The authors have no acknowledgments to declare.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

AUTHOR CONTRIBUTIONS

All authors contributed substantially to this work. The corresponding author attests that no undisclosed authors contributed to the manuscript, that is, all listed authors meet ICMJE authorship criteria and that nobody who qualifies for authorship has been excluded. Astrid Herzum, Martina Burlando, Mattia Fabio Molle, Claudia Micalizzi, Emanuele Cozzani, and Aurora Parodi: gave substantial contribution to the conception and design of the work; drafted the work and revised it critically for important intellectual content; and gave final approval of the version to be published and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

ETHICAL APPROVAL

The present research study complies with the guidelines for human studies and includes evidence that the research study was conducted ethically in accordance with the World Medical Association Declaration of Helsinki. The patient gave written informed consent to publish the case (including publication of images).

CONSENT

Written informed consent was obtained from the participant for publication of the details of their medical case and any accompanying images.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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How to cite this article: Herzum A, Burlando M, Molle MF, Micalizzi C, Cozzani E, Parodi A. Lichen planus flare following COVID-19 vaccination: A case report. *Clin Case Rep*. 2021;9:e05092. doi:10.1002/ccr3.5092