

## Case Series

# Exacerbation of Pre-Existing Dermatoses Following Covid-19 Vaccination: A Case Series from Eastern India

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## ABSTRACT

Cutaneous manifestations post-Covid-19 vaccination have been well documented in literature. However, exacerbation of underlying chronic dermatoses following COVID-19 vaccination has been infrequently reported. We hereby report an interesting series of 19 patients who had a flare of their underlying dermatological disease post-COVID vaccination.

**Keywords:** COVID vaccination, Urticaria, Vasculitis

## INTRODUCTION

Cutaneous manifestations post-COVID-19 vaccination range from injection site reactions, type 1 hypersensitivity reactions (urticaria and angioedema),<sup>[1]</sup> type 4 hypersensitivity reactions (COVID ARM and dermal fillers inflammatory reactions) to autoimmune-mediated skin findings such as lupus erythematosus and leukocytoclastic vasculitis.<sup>[2,3]</sup> Pityriasis rosea like eruption and reactivation of herpes zoster has also been commonly reported.<sup>[4]</sup> However, exacerbation of underlying chronic dermatoses following COVID vaccination has been infrequently reported in literature. We hereby report an interesting series of 19 patients who had a flare of underlying dermatological disease post-COVID vaccination at our tertiary hospital.

## CASE SERIES

We came across 19 patients presenting with an exacerbation of a well-controlled pre-existing dermatoses following COVID vaccination to our dermatology out-patient department, during a course of 12 months (April 2021–April 2022). All the patients were above 18 years of age. This series includes eight patients of chronic spontaneous urticaria, four patients of chronic plaque psoriasis (presenting with guttate flare in two cases and generalized flare in other two), two patients each of lichen planus and Hansen's disease (presenting with Type 1 and Type 2 reaction, respectively) and one patient each of lupus erythematosus, leukocytoclastic vasculitis, and parapsoriasis. [Table 1] The mean duration between vaccination and onset of flare was 1–2 weeks.

Eight patients presented with an aggravation of their pre-existing dermatoses after CoviShield vaccine which included three cases of chronic spontaneous urticaria [Figure 1], two patients each with chronic plaque psoriasis and Lichen planus and a single patient of Hansen's each with Type 1

**Table 1:** Flare of pre-existing dermatoses post-COVID vaccination.

Disease flared	No. of cases	Disease activity before vaccination	Vaccine given	Vaccine dose	Mean no. of days for flare	Treatment given	Average duration of disease subsidence
Chronic spontaneous urticaria	8	Stable	CoviShield-3 Covaxin-4 (1 from booster dose)	Second dose	5	Anti histamines	4 days
Psoriasis	4	Stable	CoviShield-2 Covaxin-2	Second dose	8.34	cyclosporine	15 days
Lichen planus	2	Stable	CoviShield	Second dose	7-10	Topical high potency steroids	12 days
Hansen's Disease (flare of Type 2 Lepra Reaction)	2	Stable	Covishield-1 Covaxin-1	second dose	1-2 weeks	Oral steroids, thalidomide	15 days
Lupus erythematosus	1	Stable	Covaxin	First dose	10	Oral steroids, Hydroxychloroquin	20 days
Leukocytoclastic vasculitis	1	Stable	Covaxin	Second dose	5-7	Oral steroids	8 days
Parapsoriasis	1	Stable	Covaxin	Second dose	7	Methotrexate	10 days



**Figure 1:** Acute urticaria – wheals over bilateral thighs.

reaction. The flare was observed within an average period of 10–15-day post-vaccination.

Eleven patients developed an exacerbation after taking Covaxin. This included five patients with chronic spontaneous urticaria, two cases with chronic plaque psoriasis, one case each of Hansen’s disease with Type 2 reaction, lupus erythematosus, leukocytoclastic vasculitis [Figure 2], and parapsoriasis.

All the patients had a stable course of the disease and were on maintenance therapy with low dose of anti-histamines, methotrexate (in psoriasis and leukocytoclastic vasculitis), WHO multi drug therapy (for Hansen’s disease) and appropriate topical therapy prior to the vaccine. They had a mild-to-moderate exacerbation thereafter and were managed symptomatically.

## DISCUSSION

Vaccines such as a single-stranded RNA and double-stranded RNA act as a strong inflammatory signals. After administration, they get recognized by various endosomal and cytosolic innate sensors (TLR3, TLR7) which then results in cellular activation and production of Type I interferons, and multiple inflammatory mediators<sup>[5]</sup> The potency of mRNA vaccines has been optimized by the encapsulation of the mRNA into lipidic nanoparticles, called LNPs, to protect the mRNA from degradation by RNase enzymes. The intramuscular inoculation of LNP-formulated mRNA vaccines results in a local and transient inflammation in the muscle, which then stimulates the recruitment of neutrophils and antigen-presenting cells to the site of delivery.<sup>[6]</sup>

Moreover, Polyethylene glycol-2000 (PEG) and polysorbate 80 are the two main potential allergenic excipients found in COVID-19 vaccines. PEG-2000 is found in the Pfizer/



**Figure 2:** Multiple well defined purpuric macules and papules present over bilateral lower limbs.

BioNTech and Moderna vaccines and polysorbate 80 in the Oxford/AstraZeneca and Johnson and Johnson vaccines. They may play a role in eliciting urticaria through both immediate and delayed hypersensitivity reactions.<sup>[7]</sup>

Sotiriou *et al.* reported 14 cases of exacerbation of psoriasis post-COVID-19 vaccination and suggested that an immunologic Th1-mediated response is responsible for worsening of psoriasis post-vaccination.<sup>[8]</sup> The up-regulation of Th1 leads to increase in IL-2, TNF $\alpha$  and

IFN $\gamma$  that is probably accountable for exacerbation of lichen planus,<sup>[9]</sup> whereas high levels of spike proteins in mRNA and AdV vaccines may stimulate production of Type 1 Interferons which in turn may disrupt B- and T-cell tolerance mechanisms leading to production of anti nuclear antibodies and thus leading to aggravation of lupus erythematosus.<sup>[10]</sup>

Cohen *et al.* reported flare of leukocytoclastic vasculitis two days after receiving BNT162b2 mRNA COVID-19 vaccine with a probable mechanism being abnormal immunological activation due to antigens present in the vaccine leading to vessel damage.<sup>[3]</sup> Panda *et al.* suggested a hypothesis of neutrophilic infiltration and production of inflammatory cytokines causing pathological injury in a cases of leprosy reaction presenting with acute foot drop after COVID vaccination.<sup>[11]</sup>

The authors of this manuscript also reported a series of dermatological adverse effects with two vaccines, CoviShield (Oxford AstraZeneca chimpanzee adenovirus-based vectored vaccine), and Covaxin (inactivated COVID-19 vaccine) previously.<sup>[12]</sup>

Post-vaccine exacerbation of underlying dermatoses has been previously documented with influenza vaccine, wherein significant worsening of pre-existing chronic mild psoriasis and/or new-onset (especially guttate) disease has been observed.<sup>[13]</sup> Exacerbation of psoriasis following mRNA based vaccines has been described in a series of 14 patients from Europe as well.<sup>[8]</sup> Single case reports have described flare of urticaria, darier's disease, and leukocytoclastic vasculitis following COVID vaccination.<sup>[14]</sup> Our series represents the first from India precisely describing the transient flare of dermatological diseases post-COVID vaccination.

## CONCLUSION

While the fourth wave of covid is knocking at the door and the vaccination drive picking up the momentum, dermatologists need to be aware of the possible cutaneous sequelae following COVID-19 vaccination.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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## Conflicts of interest

There are no conflicts of interest.

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