

# Pityriasis rosea–like rash after messenger RNA COVID-19 vaccination: A case report and review of the literature



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A spectrum of cutaneous reactions to SARs-CoV-2 (COVID-19) vaccines have been reported in the literature. We present a case of a pityriasis rosea-like rash occurring after Pfizer COVID-19 vaccination and review cases of pityriasis rosea (PR)/PR-like eruption (PR-LE) after mRNA COVID-19 vaccine published in the medical literature. Of the 30 cases found, none experienced severe adverse effects and the rash resolved in an average of 5.6 weeks. It is important for physicians to be aware of this self-limited reaction so they can reassure and appropriately counsel patients that it is safe to receive subsequent vaccine doses despite the cutaneous eruption. Additionally, differences in incidence of this reaction after Pfizer and Moderna vaccination may suggest a differing host immune response incited by these vaccines which warrants further investigation. (JAAD Int 2022;7:164-8.)

**Key words:** coronavirus; COVID-19; dermatology; Moderna; mRNA vaccine; Pfizer; pityriasis rosea; pityriasis rosea–like eruption; PR; PR-LE; vaccine.

In response to the COVID-19 pandemic, vaccines were developed at record speed, and as of January 2022, 9.2 billion vaccine doses have been administered worldwide.<sup>1</sup> The Pfizer/BioNTech (BNT162b2) and Moderna (messenger RNA [mRNA]-1273) vaccines have been widely administered in the United States, accounting for 58% and 38% of vaccinations, respectively.<sup>1</sup> These vaccines use a novel mRNA technology. Although their initial trials showed only local site reactions, as these vaccines have been distributed, numerous cutaneous side effects have been reported. In contrast, the Johnson and Johnson (Ad26.COV2.S) vaccine, using a nonreplicating viral vector, has fewer dermatologic side effects reported to date. Among reported cutaneous reactions to mRNA vaccination, delayed large local reaction (a wheal at the injection site after 4 or more days) occurred most commonly.<sup>2</sup> Other reported reactions include injection site, urticarial, and morbilliform eruptions. Less commonly reported are pernio, herpes simplex

flares, pityriasis rubra pilaris, and pityriasis rosea (PR)–like reactions.

Pityriasis rosea–like eruptions (PR-LEs) have been reported to both SARS-CoV-2 infection and COVID-19 vaccination. Classically, PR is a cutaneous eruption that begins with a single erythematous scaly plaque (herald patch) that progresses to multiple plaques or patches that develop diffusely over the trunk and extremities oriented along skin cleavage lines. The pathologic mechanism is unknown but believed to be the systemic reactivation of the human herpes virus (HHV)-6 or HHV-7.<sup>3</sup>

We describe a case of PR-LE after the first dose of the Pfizer mRNA COVID-19 vaccine and review all other published cases of PR or PR-LEs after mRNA COVID-19 vaccines. Interestingly, of the 30 reported cases of PR secondary to the mRNA vaccine, which we review, 29 (96.7%) were in relation to the Pfizer vaccination.

A healthy 23-year-old woman presented to the dermatology clinic for evaluation of a diffuse scaly

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eruption of 1 week's duration. The rash initially began as an isolated scaly plaque under the right breast and quickly became more diffuse. The patient described the rash as mildly pruritic and had not received any treatments. She denied recent viral illness, new medication, or similarly affected contacts. She denied a history of a similar rash. She noted that she received the first dose of the Pfizer COVID-19 vaccination 7 days prior to the onset of the eruption. Other than mild fatigue, the patient had no other reactions at the time of vaccination. Physical examination revealed numerous oval to annular salmon-colored plaques with a collarette of scale diffusely involving the trunk and extremities. On the trunk, the plaques were oriented along skin cleavage lines in a Christmas tree distribution (Fig 1). On the inferior portion of the right breast, there was a 3-cm oval scaly plaque, larger than the other lesions, consistent with a herald patch (Fig 2). Triamcinolone cream was prescribed for pruritus, and the patient was reassured of the self-limited nature of the reaction and that it may take up to 6 weeks to resolve. We recommended her to still receive the second dose of the vaccine.

To better characterize PR or PR-like reactions after COVID-19 vaccination, we conducted a review of the medical literature. We searched the PubMed database for articles, including case reports and case series, using the following search terms: COVID-19 vaccine, coronavirus 2019 vaccine, SARS-CoV-2 vaccine, pityriasis rosea, and pityriasis rosea-like reaction. Cases were included if the patient was clinically diagnosed with PR or PR-LE and the rash had a temporal relationship to an mRNA COVID-19 vaccine. The search revealed 9 publications with 29 cases (30 including the current case) of PR or PR-LE after any mRNA COVID-19 vaccination (Table I).<sup>4-11</sup>

Of the 30 cases, 29 (96.7%) occurred after the Pfizer vaccine and 1 (3.3%) after the Moderna vaccine. The average time of onset after vaccination was 10 days. The average age of the patients was 41 years. Sixteen patients (53.3%) had a reaction to the first dose, 11 (36.7%) to the second dose, and 3 (10%) to both first and second doses. In the 3 patients who had reactions to both doses, the lesions began after the first dose and were exacerbated by the second dose.

PR is usually diagnosed on the basis of clinical history and physical examination findings.<sup>12</sup> When evaluating a patient for PR, it is important to consider other similar appearing entities such as secondary syphilis or guttate psoriasis.<sup>12</sup> The history of a herald patch and spontaneous resolution of the rash are helpful distinguishing features. When the

presentation is atypical or diagnosis unclear, histopathology can be helpful. In the cases we reviewed pathology was lacking, and as in most cases of PR, the diagnosis was made on the basis of history and examination findings. Seventy-nine percent of these patients had a herald patch, which would not be consistent with other disorders in the differential diagnosis. The average duration of the rash was 5.6 weeks. Viral serology for HHV-6/7 was performed

in only 1 case, which was negative.<sup>5</sup> All cases of PR after COVID-19 vaccination resolved, and none were associated with additional adverse events.

Most cases were reported as PR or PR-LE; however, 3 cases were atypical (eg, purpuric or vesicular).<sup>9</sup> In the literature, PR has been distinguished from PR-LE. PR-LE is defined as a reaction to a drug or vaccine, whereas classic PR is sporadic. However, there are other distinguishing characteristics such as the presence of herald patch, evidence of HHV-6/7, morphology of lesions, and systemic symptoms.<sup>12</sup> In most cases, there are overlapping features of PR and PR-LE; therefore, the distinction is not always clear. This differentiation is important in cases of drug-induced PR-LE, in which there is a risk of progression to a more severe drug reaction, and consideration should be given to stopping the offending medication.<sup>12</sup> In our cases of COVID-19 vaccine-induced PR, no further reactions or adverse events were reported. For consistency, we report the clinical type as the original investigators did, understanding that the distinction between PR and PR-LE may be unclear and is likely irrelevant for our purposes of characterizing this post-vaccination exanthem.

PR is usually associated with reactivation of HHV-6/7; however, other viruses, vaccinations, and drugs have also been linked to this exanthem. Cases of PR-LE have been reported secondary to the SARS-CoV-2 infection itself.<sup>4,13,14</sup> In one of these cases, there was confirmed reactivation of HHV-6, HHV-7, and

### CAPSULE SUMMARY

- Many cutaneous eruptions have been reported to COVID-19 vaccinations. There have been cases and case series reported of pityriasis rosea-like eruptions.
- Physicians should recognize that pityriasis rosea-like eruptions following COVID-19 vaccinations are benign and self-limited, so they may counsel patients that it is safe to receive subsequent doses.

*Abbreviations used:*

HHV:	human herpes virus
mRNA:	messenger RNA
PR:	pityriasis rosea
PR-LE:	pityriasis rosea-like eruption



**Fig 1.** Pityriasis rosea. Numerous scattered erythematous plaques with fine scale oriented along skin cleavage lines, most appreciable on the upper portion of the chest.

Epstein-Barr virus with an associated PR-like rash in a young, otherwise healthy individual.<sup>15</sup>

Before the COVID-19 pandemic, PR had been reported as a reaction to other vaccines. A 2016 review found 29 reported cases of PR or PR-LE after vaccination.<sup>16</sup> Most cases have been reported to the smallpox ( $n = 10$ ) and tuberculosis ( $n = 5$ ) vaccines. Other culprits include poliomyelitis, influenza, papillomaviruses, diphtheria, tetanus, hepatitis B, pneumococcus, diphtheria-pertussis-tetanus, and yellow fever vaccines. The mean reported age was 23 years, and the average time to onset from vaccination was 17 days.<sup>16</sup>

The pathogenic mechanism of PR after vaccination is unknown. Classic PR is believed to be related to reactivation of HHV-6/7 by way of immune-induced viral reactivation. In the setting of vaccination or infection, the systemic immune-mediated inflammatory environment may distract T cell-mediated immune control on the latent virus.<sup>5,16,17</sup> In the setting of COVID-19 vaccine-induced PR, this pathogenesis is supported by reports of herpes simplex and zoster flares in addition to PR following



**Fig 2.** Herald patch of pityriasis rosea. A 3-cm oval plaque with peripheral scale, larger than the other lesions, was present on the inferior portion of the right breast.

COVID-19 vaccination.<sup>2</sup> The case of PR with confirmed HHV-6/7 and Epstein-Barr virus reactivation during SARS-CoV-2 infection similarly supports a shared immune-related pathogenesis to PR induced by SARS-CoV-2 infection or COVID-19 vaccination.<sup>15</sup> The report of cases of PR after both SARS-CoV-2 infection and COVID-19 vaccination suggests that the host immune response to the virus is replicated by the vaccine. This finding also suggests that cutaneous manifestations of PR after viral infection are due to the immune response rather than direct SARS-CoV-2 viral effect. To summarize, it is possible that immune-related herpes virus reactivation causing PR could be driven by infections and vaccines.

Interestingly, in our review, we found that the majority of cases (97%) of PR or PR-LE occurred after the Pfizer, rather than Moderna, mRNA vaccine. Although these vaccines use similar mRNA technology, further investigation is warranted to characterize the mechanism of differing cutaneous reactions to the Pfizer and Moderna vaccines.

Patient concerns regarding a cutaneous reaction after a vaccine dose may prevent them from getting another dose. It is important for physicians to counsel patients appropriately on the basis of the best available evidence. This self-limited reaction, regardless of pathogenic mechanism, resolved in all reported cases, and there were no severe adverse events to either the first or second dose of the vaccine in patients with postvaccination PR. Therefore, we recommend counseling these patients that benefits greatly outweigh the risks of receiving the subsequent doses of the vaccine.

PR is a rare cutaneous reaction after mRNA vaccination against SARS-CoV-2. The average time between vaccination and rash onset is 10 days, and

**Table I.** Cases of pityriasis rosea and pityriasis rosea–like eruption after messenger RNA COVID-19 vaccination

Reference	Messenger RNA vaccine type	Dose	Patient age, y	Time from vaccination to onset of PR, d (range)	Herald patch	Exanthem duration, wk	Clinical type
Current case	Pfizer	First	23	7	Yes	-	PR-LE
1	Moderna	First	-	14 (1-19)	-	1.4	PR-LE
1	Pfizer	First	-	14 (1-19)	-	1.4	PR-LE
1	Pfizer	First	-	14 (1-19)	-	1.4	PR-LE
1	Pfizer	Second	-	4	-	0.7	PR-LE
4	Pfizer	Second	26	7	Yes	-	PR
4	Pfizer	Second	29	1	Yes	-	PR
5	Pfizer	First; Second	35	-	Yes	2	PR-LE
6	Pfizer	First	66	7	Yes	4	PR
7	Pfizer	First; Second	20s	2	Yes	-	PR-LE
7	Pfizer	Second	40s	21	Yes	3	PR-LE
8	Pfizer	Second	22	7	No	6	PR
8	Pfizer	First; Second	54	7	Yes	3	PR
9	Pfizer	First	42	21	No	6	Atypical
9	Pfizer	First	61	9	Yes	9	Atypical
9	Pfizer	First	56	18	No	7	Atypical
9	Pfizer	First	42	7	Yes	6	PR
9	Pfizer	First	29	5	Yes	8	PR
9	Pfizer	First	52	19	Yes	11	PR
9	Pfizer	First	38	12	Yes	12	PR
9	Pfizer	Second	29	13	Yes	4	PR
9	Pfizer	Second	31	15	Yes	6	PR
9	Pfizer	First	52	21	Yes	11	PR
9	Pfizer	Second	27	4	No	4	PR
9	Pfizer	Second	48	5	Yes	3	PR
9	Pfizer	First	48	16	No	12	PR
9	Pfizer	First	52	11	Yes	8	PR
10	Pfizer	Second	40	7	Yes	6	PR
11	Pfizer	Second	42	4	-	-	PR-LE
11	Pfizer	First	64	5	-	-	PR-LE

PR, Pityriasis rosea; PR-LE, pityriasis rosea–like eruption.

most patients experience pruritus (70%). This reaction is self-limited and resolves in an average of 5.6 weeks. Of the reported cases, 96.7% were secondary to the Pfizer vaccine, with only 1 reported case related to the Moderna vaccine. There have not been any severe adverse events in any reported cases of postvaccination PR. It is important for physicians to be aware of the self-limited and benign nature of this rash and to appropriately counsel patients that it is safe for them to receive additional doses of the mRNA COVID-19 vaccine.

**Conflicts of interest**

None disclosed.

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