Pityriasis Rosea and Pityriasis Rosea-Like Eruption Following COVID-19 Vaccination, Case Series from Oman

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Abstract

The impact of the ongoing global pandemic of COVID-19 has been very broad and for which several vaccines have been developed and used over the past few months to alleviate its associated morbidity and mortality. A spectrum of cutaneous reactions after mRNA COVID-19 vaccines has been reported. In this case series we describe 3 peculiar cases of pityriasis rosea (PR) and PR-like eruption (PR-LE), emerging after COVID-19 vaccine, that might suggest the vaccine as a possible trigger.

Keywords: COVID-19 vaccine; Pityriasis Rosea (PR), PR-like Eruption (PR-LE).

Introduction

The ongoing global pandemic of COVID-19 has had a broad impact worldwide. Hence several vaccines have been developed and used over the past few months to alleviate its associated morbidity and mortality.

A spectrum of cutaneous reactions after mRNA COVID-19 vaccines has been reported. In a registry-based study of 414 cases with cutaneous reactions to mRNA COVID-19 vaccines, results showed that delayed large local reactions were most common, followed by local injection site reactions, urticarial eruptions, and morbilliform eruptions. Additional, less common reactions included pernio/chilblains, cosmetic filler reactions, zoster, herpes simplex flares, and pityriasis rosea-like reactions.1

Here, we describe 3 peculiar cases of pityriasis rosea (PR) and PR-like eruption (PR-LE), emerging after the COVID-19 vaccine.

Case Report

Case one

A 19-year-old male with no medical background, presented with 2 months history of pruritic, painless erythematous skin eruption over the trunk and the proximal extremities. The eruption was progressive and persistent. There were no associated systemic symptoms, and there was no involvement of the scalp, nails, or mucus membranes. The patient
denied any prior dieting, or new medication intake, but stated that the symptoms began 1 week after receiving the first dose of mRNA COVID-19 vaccine (Pfizer-BioNTech). Prior to his presentation, the patient was treated with oral anti-histamine and topical steroids, but his condition did not improve significantly.

Skin examination (Figure 1) showed erythematous non-tender, scaly papules and plaques, following skin tension lines over the lateral sides of the chest and coalescing in a reticular pattern over the lower back and abdomen. There was no petechial rash or wheals, and the clinical examination revealed no evidence of herald patch.

Figure 1: Erythematous papules and plaques, coalescing over the trunk.

A skin biopsy showed spongiotic dermatitis with mild parakeratosis. There were few collections of inflammatory cells in the epidermis. The dermis showed peri-vascular and peri-adnexal inflammation mostly lymphocytes. Immunofluorescence was negative for IgA, IgM, IgG, and C3. The features were suggestive of Pityriasis Rosea (Figure 2).

Figure 2: Skin biopsy: (A) H and E-stained slide at 4 x magnification showing spongiosis and parakeratosis. (B) H and E slide at 10 x magnification showing minimal inflammation in the epidermis. (C) H and E slide at 10 x magnification showing periadnexal and perivascular lymphocytic infiltrate.

Serology for human herpesviruses 6 (HHV6) and 7 (HHV7) was not performed. A course of oral Azithromycin 500 mg once a day for 3 days along with topical corticosteroids were prescribed, and a progressive clearance of the eruption was noted after 2 weeks (Figure 3).
**Case two**

A man in his 70s with a background of hand dermatitis which is well controlled on topical therapy presented with new onset pruritic eruption for 2 months. It started on the trunk and then spread to the extremities. There were no preceding viral illness symptoms or recent exposure to new medications. The patient received his second dose of mRNA COVID-19 vaccine (Oxford-AstraZeneca) 3 weeks prior to the eruption. The first dose was uneventful.

Skin examination (Figure 4) revealed eczematous oval-shaped plaques following cleavage lines especially on the back making a Christmas tree pattern. Some of the plaques showed collarette scales. In addition, multiple annular plaques with a clearing center on the left shoulder were noted that might be representing a herald patch. Other eczematous plaques were scattered over the forehead, neck, and abdomen. No mucosal or palmoplantar involvement.

![Figure 4: Erythematous oval plaques on the trunk along the cleavage lines.](image)
Skin biopsy (Figure 5) H&E-stained section at 10 x magnification showed focal parakeratosis and spongiosis with perivascular lymphocytic infiltrate with occasional neutrophils and red blood cells extravasation in the dermis.

**Figure 5:** Skin biopsy: H and E-stained slide at 4 x magnification showing focal parakeratosis and spongiosis with perivascular lymphocytic infiltrate.

CBC showed no evidence of eosinophilia. HHV6/7 testing was not performed. The patient was treated with azithromycin and antihistamine, and a good response was noted in 2 weeks follow-up visit (Figure 6).

**Figure 6:** Gradual improvement in the rash noticed 2 weeks after the treatment.

**Case three**

A lady in her 30s with no medical background presented to the dermatology clinic with 1 week history of an erythematous pruritic skin eruption on the trunk, arms, and axillae. There were no associated constitutional symptoms. There was no mucosal or palmoplantar involvement. The patient denied new medication intake but reported developing the eruption 2 weeks after receiving the first dose of mRNA COVID-19 vaccine (Pfizer-BioNTech).

Skin examination (Figure 7) showed erythematous confluent targetoid lesions with collarette scales on both forearms, arms, and trunk. There was a large annular erythematous plaque with central clearing and collarette scaling located on the left axilla, consistent with herald patch. No petechial rash or wheals were present.
Laboratory investigations including HHV6/7 were not obtained for the patient. A course of oral Azithromycin 500 mg for 3 days along with topical corticosteroids were prescribed, and a progressive clearance of the eruption was noted after 3 weeks (Figure 8). The patient reported recurrence of the eruption with a milder picture after the second dose of mRNA COVID-19 vaccine.

Figure 7: (A,B): Erythematous confluent targetoid lesions with collarette scales. (C) Herald patch.

Discussion

Pityriasis rosea (PR) is a papulo-sequamous disease, typically preceded by a primary solitary herald patch followed by the onset of smaller scaly lesions on the skin tension lines within days to weeks. It is mainly associated with endogenous systemic reactivation of HHV6/7 infections.

Based on proposed criteria suggested by Dragó F et al, pityriasis rosea-like eruption (PR-LE) is better viewed as a drug/vaccine hypersensitivity reaction that morphologically resembles PR, in comparison to the classic PR. PR-LE usually presents with severe itching and atypical morphology of the skin lesions, such as papules, vesicles, urticated plaques, purpura, and target lesions (erythema multiforme-like). The lesions are larger in size or present as confluent plaques. Unusual distribution patterns of the skin lesions are more common in PR-LE, like an inverse pattern, prominent involvement of the skin folds, face, or greater involvement of limbs than the trunk. In addition, mucosal involvement is more prominent with PR-LE than the classical PR. Lack of Herald patch is more noted in PR-LE. Regarding histopathology, PR-LE presents with a picture of interface dermatitis with eosinophils, while PR usually present with parakeratosis, spongiosis, and lymphocytic infiltrate. PR-LE usually resolves faster if the culprit drug is stopped compared to PR.
In this case series, we noticed that the first and second cases showed morphology resembling PR but with atypical morphology, and prominent itch. Hence, we diagnosed them as PR-LE. In comparison, the third case represented more PR given the typical morphology with collarette scales and obvious herald patch, although proximal upper limbs involvement was not classic.

PR and PR-LE have rarely been observed to develop after vaccinations. PR and PR-LE cases have been reported in association with vaccinations including smallpox, tuberculosis, influenza, papillomaviruses, poliomyelitis, tetanus, diphtheria, pneumococcus, diphtheria-pertussis-tetanus, hepatitis B, and yellow fever. In such instances, the average time lapse between vaccination and eruption onset ranged from 5 to 17 days, and the exanthema lasted from 2 to 6 weeks. 

The exact pathogenetic mechanism that leads to PR and PR-LE after vaccination is unknown. Differentiation between the two was difficult and virological investigations for HHV-6/7 reactivation were performed only in a minority of cases. In cases of vaccine-induced PR, high cytokine response to the vaccine leading to immune dysregulation and reactivation of latent viral infections, such as HHV-6/7, has been hypothesized. 

All three cases we presented in this case series occurred following COVID-19 vaccination which might suggest the vaccine as a possible trigger. Interestingly, all three cases responded well to Azithromycin. Histopathological examinations of the first two cases were supportive of the diagnosis of PR.

The literature has shown several reports of cutaneous symptoms related both to the vaccination schedule against COVID-19 and related to the COVID-19 infection itself however, it is not yet known whether the SARS-CoV-2 virus or particles present in vaccines perform a role in the pathogenesis of dermatological diseases. After the pandemic, the number of patients with PR increased significantly, which might be related to HHV-6 reactivation.

In a registry-based study conducted in the United States, between December 2020 and February 2021, 414 skin reactions to the COVID-19 mRNA vaccines, Moderna (83%) and Pfizer (17%), were recorded. Delayed local reactions were the most common, followed by urticarial eruptions and morbilliform eruptions. Forty-three percent of patients with reactions to the first dose experienced recurrence after the second dose. Other reported, less common reactions include the manifestations of herpes zoster, herpes simplex, and PR-LE. PR-LE was present in 1 report after the first dose of Moderna, 2 reports after the first dose of Pfizer, and 1 report after the second dose of Pfizer.

Maria et al, has reported a case of a 52-year-old woman with PR developed 15 days after the second dose of the Oxford-AstraZeneca vaccine. 

Subsequently, a case report from Turkey reported a 45-year-old woman reported to develop PR after CoronaVac COVID-19 vaccination. The rash developed 4 days after receiving the first dose of the vaccine and was treated symptomatically with topical steroids and an oral antihistamine. Similar to our third case, she had a recurrence of the eruption after the second dose of the vaccine.

A four-months cross-sectional Spanish nationwide study showed 405 reactions after vaccination with the BNT162b2 (Pfizer-BioNTech, 40.2%), mRNA-1273 (Moderna, 36.3%) and AZD1222 (AstraZeneca, 23, 5%). PR-LE constituted 4.9% of all cutaneous reactions.

The histological changes in skin biopsies from the patient having skin lesions post COVID-19 vaccination are variable. These range from mild spongiosis to full-blown pityriasis rosea-like reactions. In both the cases we reported, there was evidence of spongiosis and dermal perivascular inflammation predominantly lymphocytes. Focal parakeratosis was also noted.

Despite that the recurrence with the booster dose might not occur with PR according to Drago et al, the recurrence of the eruption was evident in the third case of this case series, which might highlight more of a causal relationship.
Large-scale epidemiological studies are warranted to be conducted to further elucidate whether there is a relationship between vaccination regimens and the reactivation of latent viruses, as well as to assess whether this reactivation could be a coincidence or a consequence of the SARS-CoV-2 vaccines.

Conclusion

The PR and PR-LE are possible cutaneous reactions triggered by COVID-19 vaccination. Since they are self-limiting diseases and rarely require treatment, we would emphasize the necessity of the vaccine against the serious COVID-19 infection along with the close observation of the skin eruption.

Acknowledgments

The patients in this manuscript have given written informed consent to the publication of their case details.

References