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Inverse pityriasis rosea secondary to COVID-19 vaccination

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ABSTRACT

A 56-year-old woman presented for evaluation of a pruritic rash with associated body aches, fever, and chills that first appeared about 1 week after Johnson and Johnson COVID-19 vaccination. The rash initially presented as one lesion on her left breast that then spread to her face and groin. Based on clinical presentation, dermoscopic findings, and histopathological examination, a diagnosis of inverse pityriasis rosea was made. Although the exact pathogenesis of pityriasis rosea remains unknown, current evidence suggests that the inflammatory reaction to infectious agents, vaccines, certain drugs, or reactivation of herpesvirus 6 and 7 are possible etiologies.

KEYWORDS COVID-19; pityriasis rosea; vaccination

Pityriasis rosea (PR) is a benign papulosquamous disorder characterized by a scaly patch, followed by the eruption of secondary small erythematous lesions. In the case of inverse PR, the lesions present in acral and flexural areas including the face, axilla, and groin. The lesions can be preceded with a prodrome of fever, arthralgias, chills, sore throat, and gastrointestinal disturbances. We present a case of inverse PR following COVID-19 vaccination.

CASE PRESENTATION

A 56-year-old woman presented for evaluation of a pruritic rash present for over 6 weeks. Appearing about 1 week after she received the Johnson and Johnson COVID-19 vaccine, the rash started as one pruritic lesion on her left breast that subsequently spread to her face and groin. She also noticed associated body aches, fever, and chills for the first week accompanying the rash. She was first evaluated by her primary care provider and was given nystatin powder with no relief of the pruritus or resolution of the rash.

Physical examination revealed erythematous papules and plaques with a trailing scale distributed predominantly in the axilla, inframammary, and groin area, with a total body surface area of around 5% *(Figure 1)*. Dermoscopy revealed a collarette of scale as well as central yellow hue with a peripheral reddish background *(Figure 2a)*. Two 4-mm punch biopsies were performed, one on the first reported lesion under her left breast and the other on a lesion in the groin. Pathology revealed areas of confluent parakeratosis as well as mounds of parakeratosis. Moderate psoriasiform hyperplasia of the epidermis with moderate spongiosis, moderate inflammatory infiltrate of lymphocytes with eosinophils in the dermis, extravasation of red blood cells, and moderate exocytosis of lymphocytes into the epidermis were also observed on histopathology *(Figures 2b–2d)*. A periodic acid-Schiff stain was negative for fungus or yeast. The histologic differential at this point included psoriasis, PR, subacute to chronic eczema, and contact dermatitis. The patient was given topical corticosteroids. Two weeks later, she reported improvement in her symptoms with almost complete resolution of the rash and pruritus.

DISCUSSION

The histopathologic and clinical presentation confirmed inverse PR as the etiology of the patient's rash. PR, a self-limiting rash of uncertain etiology, is characterized by an initial herald patch on the trunk followed by a diffuse papulosquamous rash.[1] The herald patch is defined by an erythematous lesion with a depressed center and elevated scaling borders. The secondary eruption, also known as the generalized rash, presents on the trunk along Langer's lines of cleavage and may extend to the upper arms and upper legs.[2] PR can present in different morphological patterns, including an inverse form. Inverse PR is an atypical presentation affecting areas that are

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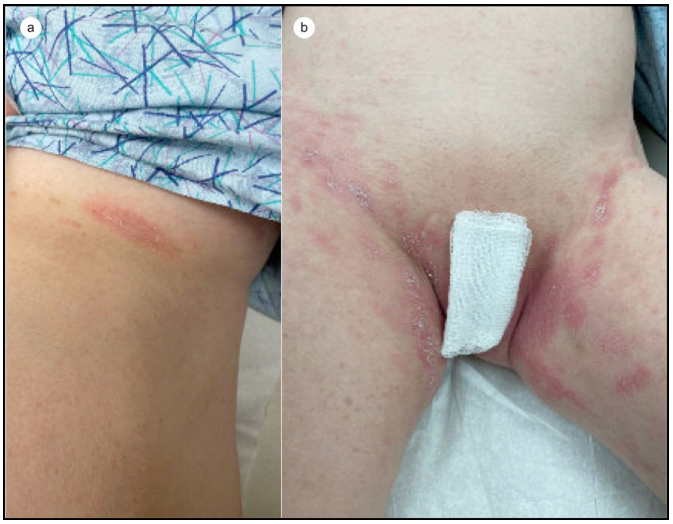

Figure 1. **(a)** Herald patch of inverse pityriasis rosea distributed in the left inframammary fold. **(b)** Multiple coalescing erythematous plaques with scale distributed in the groin area.

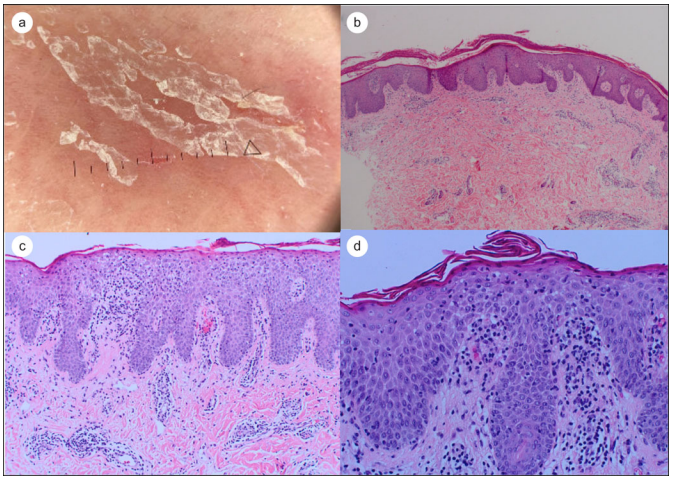

Figure 2. **(a)** Dermoscopy showing a collarette of scale as well as central yellow hue with peripheral reddish background. **(b)** Histopathological findings of hyperkeratosis, spongiosis, and inflammatory infiltrate in the dermis (hematoxylin and eosin stain [H&E], ×100). **(c)** Slight hyperkeratosis, spongiosis, and a mild infiltration of perivascular lymphocytes and extravascular erythrocytes into the superficial dermis (H&E, ×200). **(d)** A mound of parakeratosis (H&E, ×400).

normally spared, most notably targeting the face, extremities, and flexural areas of the body (axillae, popliteal fossae, elbows, and groin).[3] PR can also be associated with prodromal symptoms, including fever, arthralgias, chills, sore throat, and gastrointestinal disturbances, before or during the course of the rash.[2] While the exact etiology of PR has not been confirmed, evidence has pointed to a possible infectious etiology, associations with vaccination, and reactivation of human herpesvirus (HHV)-6 and -7.[4] PR has been reported as a rare cutaneous manifestation of the COVID-19 infection itself and the vaccinations.

Diagnosis of PR has become more common during the COVID-19 pandemic, but it remains unclear if PR associated with COVID-19 infection is due to direct invasion of SARS-CoV-2, HHV-6 and -7 reactivation, or other factors.[5] While the case presented involves the Johnson and Johnson COVID-19 vaccination, other COVID-19 vaccines including Pfizer, Moderna, and Oxford-AstraZeneca have also noted PR as an adverse reaction.[6,7] PR as a manifestation of COVID infection itself, in addition to vaccination, possibly suggests the host immune response to the virus is being replicated by the vaccine.[6] Although rare, PR eruptions have been reported after other vaccination schedules including influenza, diphtheria, smallpox, human papillomavirus, hepatitis B, pneumococcus, and bacille Calmette-Guerin.[8] It has been hypothesized that the immune system stimulation from vaccinations can distract the cell-mediated control of latent infections, leading to endogenous systemic reactivation of HHV-6 and -7, causing PR.[8–10] Investigations have suggested that immune-related HHV reactivation from infections, vaccinations, medications, or other factors may be involved in the pathogenesis of PR.[9] With the increasing need for immunization against COVID-19 and administration of vaccine boosters, health professionals should be aware of PR as a potential adverse reaction to vaccination. PR is a self-limiting exanthem that can be treated symptomatically.

1. Stulberg DL, Wolfrey J. Pityriasis rosea. *Am Fam Physician*. 2004; 69(1):87–91.
2. Villalon-Gomez JM. Pityriasis rosea: diagnosis and treatment. *Am Fam Physician*. 2018;97(1):38–44.
3. Gupta N, Levitt JO. Unique clinical presentations of pityriasis rosea: aphthous ulcers, vesicles and inverse distribution of lesions. *Dermatol Online J*. 2017; 23(2):13030/qt3mk4z6w0.
4. Mahajan K, Relhan V, Relhan AK, Garg VK. Pityriasis rosea: an update on etiopathogenesis and management of difficult aspects. *Indian J Dermatol*. 2016; 61(4):375–384. doi:10.4103/0019-5154.185699.
5. Welsh E, Cardenas-de la Garza JA, Cuellar-Barboza A, Franco-Marquez R, Arvizu-Rivera RI. SARS-CoV-2 spike protein positivity in pityriasis rosea-like and urticaria-like rashes of COVID-19. *Br J Dermatol*. 2021;184(6):1194–1195. doi:10.1111/bjd.19833.
6. McMahon DE, Amerson E, Rosenbach M, et al. Cutaneous reactions reported after Moderna and Pfizer COVID-19 vaccination: a registry-based study of 414 cases. *J Am Acad Dermatol*. 2021;85(1):46–55. doi:10.1016/j.jaad.2021.03.092.
7. Pedrazini MC, da Silva MH. Pityriasis rosea-like cutaneous eruption as a possible dermatological manifestation after Oxford-AstraZeneca vaccine: case report and brief literature review. *Dermatol Ther*. 2021; 34:e15129. doi:10.1111/dth.15129.
8. Drago F, Ciccarese G, Javor S, Parodi A. Vaccine-induced pityriasis rosea and pityriasis rosea-like eruptions: a review of the literature. *J Eur Acad Dermatol Venereol*. 2016;30(3):544–545. doi:10.1111/jdv.12942.
9. Busto-Leis JM, Servera-Negre G, Mayor-Ibarguren A, et al. Pityriasis rosea, COVID-19 and vaccination: new keys to understand an old acquaintance. *J Eur Acad Dermatol Venereol*. 2021;35(8):e489–e491. doi:10.1111/jdv.17301.
10. Abdullah L, Hasbani D, Kurban M, Abbas O. Pityriasis rosea after mRNA COVID-19 vaccination. *Int J Dermatol*. 2021;60(9): 1150–1151. doi:10.1111/ijd.15700.