(5.6%) to critical (1.4%). Thirteen responders (18.3%) experienced mucocutaneous symptoms during their diseases course. (Table 1) Eight responders had isolated skin changes (11.3%); urticarial lesions (5.6%;4/71), macular erythema (2.8%;2/71) and morbilliform rash (2.8%;2/71) whereas, mucosal manifestations (9.8%;7/71) included glossitis and papillitis (4.2%;3/71), oral ulcers (2.8%;2/71) and non-specific oral lesions (2.8%;2/71). One responder with oral ulcer also had gingivitis. Mucocutaneous lesions occurred either before (15.4%;2/13), concurrent with (76.9%;10/13) or after (7.6%;1/13) development of other systemic COVID-19 symptoms. Lesions lasted for 2-5 days (69.2%;9/13) in the majority; in others, duration was 5-7 days (15.4%;2/13) to less than 2 days (7.6%;1/13), or greater than 7 days (7.6%/1/13). All patients were laboratory-confirmed cases and disease severity indicated as mild (30.7%;4/13), moderate (53.8%;7/13) and severe (15.4%;2/13).

Accurate morphologic description is essential to understanding the various mucocutaneous findings and their prevalence in COVID-19. Globally, the reported prevalence varies from 0.2 to 45.7%.2,3 This large variation may be due to increased awareness among dermatologists as well as non-dermatologist physicians.

Additionally, mucocutaneous findings also vary with geography: vasculitic and pseudo-chilblain like lesions are more common in European countries and the United States.8,9 While studies from Brazil and India have found vasculitic lesions to be uncommon.4,6 In a previous Indian study, none of the asymptomatic, mild or moderate cases developed vasculitic lesions.10 Another interesting point is that despite a huge number of COVID-19 cases in India, reports describing mucocutaneous manifestations are scarce. One reason may be that dermatologists are not primary physicians for COVID-19 cases. Therefore, we conducted this survey among dermatologists with COVID-19 to reliably investigate the mucocutaneous manifestations in the Indian population. This survey is limited by a small sample size and similar surveys among dermatologists globally can aid in collecting more data.

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Pityriasis rubra pilaris after Vaxzevria® COVID-19 vaccine

To the editor,
A 63-year-old Caucasian woman presented with rapidly developing lesions on both hands, elbows and feet, 9 days after she received the first dose of the Oxford-AstraZeneca COVID-19 vaccine ChAdOx1-S n-CoV19 (Vaxzevria®, AstraZeneca, Cambridge, UK).

On physical examination, she presented orange-red waxy palmoplantar keratoderma, symmetrical and sharply demarcated orange-red squamous plaques on the elbows, follicular keratotic orange-red papules on the dorsal aspect of hands and feet, and subtle erythema and fine diffuse scaling on the scalp, with associated pruritus. Onycholysis with orange border could also be seen on both great toenails (Fig. 1).
Figure 1  (a) Orange-red waxy and symmetrical palmoplantar keratoderma. (b) Sharply demarcated and symmetrical orange-red squamous plaques on the elbows. (c) Sharply demarcated orange-red squamous plaques and follicular keratotic papules on the dorsal aspect of both feet. Note the onycholysis with a surrounding orange border on both great toenails. (d) Photomicrograph showing psoriasiform dermatitis with hypergranulosis, hyperkeratosis and alternating orto- and parakeratosis in a ‘checkerboard pattern’, as well as a sparse lymphohistiocytic perivascular infiltrate in the papillary dermis (haematoxylin-eosin stain, original magnification ×40).

Table 1  Reported cases of post-vaccine pityriasis rubra pilaris

| Authors                      | Age of the patient | Sex of the patient | Vaccine type                  | Vaccine dose | Time-to-onset (days) |
|------------------------------|--------------------|--------------------|--------------------------------|--------------|---------------------|
| Naciri Bennani et al. (2011) | 17 months          | Male               | MMR                           | First        | 15                  |
| Mohamed et al. (2015)        | 19 months          | Male               | MMR + oral poliovirus         | Second       | 14                  |
| Musette et al. (1997)        | 32 years           | Female             | DTPo                          | First and second | 10                  |
| Bitbol-Duneton et al. (2006) | 47 years           | Female             | Tetragrip®                    | N/A          | 18                  |

DTPo, diphtheria-tetanus-polio; MMR, measles-mumps-rubella.
She only had a history of familial hypercholesterolemia, along with moderate hepatic steatosis and a past statin-induced myopathy, but was otherwise healthy. She was only on cholestyramine resin, which she had been taking for many years. There was no previous history of infections, significant UV exposition, traumatisms or other associated diseases. HIV serology was negative. The only potential trigger was the first dose of the Vaxzevria® vaccine, which was administered 9 days before disease onset. She had suffered from COVID-19 in March 2020, with anosmia as the main symptom.

Two biopsies, taken from the elbow and the dorsal aspect of one foot, showed a psoriasiform dermatitis with hypergranulosis, hyperkeratosis and alternating ortho- and parakeratosis in a ‘checkerboard pattern’, as well as a sparse lymphohistiocytic perivascular infiltrate in the papillary dermis. All these features were consistent with clinical suspicion of pityriasis rubra pilaris (PRP).

Within a few days, the patient experienced worsening of the lesions, with newly appearing orange keratotic papules and plaques on both forearms, lower back and lower limbs. Then, Acitretin therapy was started at an initial dose of 20 mg per day.

Currently, vaccination against SARS-CoV-2 is being carried out worldwide. Vaxzevria® vaccine is one of the currently approved vaccines in the European Union for this purpose, and consists of a replication-deficient chimpanzee adenoviral vector ChAdOx1, containing the SARS-CoV-2 structural surface glycoprotein antigen (spike protein) gene.1

A wide variety of cutaneous adverse effects after COVID-19 vaccination are currently being described.2–6 The majority of them develop at the injection site, and can be classified into early-onset reactions (i.e. pain, pruritus, swelling, erythema), with a median time-to-onset of 1 day, and delayed large local reactions, with a median time-to-onset of 7 days after the first dose or 2 days after the second dose, and a median duration of 3–4 days.2 However, a fair amount of cutaneous adverse effects develops at a location distant from the injection site. These reactions can also be classified into immediate reactions (i.e. pruritus, urticaria, flushing, angioedema and anaphylaxis), with a time-to-onset lower than 4 h, and delayed reactions, which include urticarial rash, morbilliform rash, pityriasis rosea-like rash, herpes simplex or varicella zoster reactivation, filler inflammatory reactions, erythromelalgia and pernio, among others.2 Most of the publications on this issue are referred exclusively to mRNA vaccines.2–4 Data addressing cutaneous adverse effects secondary to non-mRNA based COVID-19 vaccines are still lacking.

Post-vaccine PRP has been rarely reported in the literature. To our knowledge, only four cases have been published to date, concerning two infant males (17 and 19 months old) and two women (32 and 47 years old). The vaccines involved were diphtheria-tetanus-polio, influenza (Tetragrip®, Sanofi Pasteur, Lyon, France) and measles-mumps-rubella, with a time-to-onset of the lesions ranging from 10 to 18 days7–10 (Table 1).

Although the association between COVID-19 vaccination and PRP could be entirely casual, we cannot rule out a causal relationship since the lesions were temporally associated with vaccination and showed acute onset and rapid development. Accordingly, this could be the first reported case of PRP induced by COVID-19 vaccination.

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