superficial layers of the epidermis. The epidermis was variably acanthotic, focally spongiotic and parakeratinised in places. A Periodic acid-Schiff stain for fungal hyphae was negative.

The overall findings were those of a lichenoid dermatitis. The paucity of the civatte bodies in this case argued against a diagnosis of erythema multiforme. On review 1 week after the initial consultation, the exanthem had significantly improved. The dose of oral steroids was tapered off by 5 mg every 3 days. The exanthem had completely resolved 2 weeks after oral corticosteroids were initiated.

Vaccination-associated lichenoid drug eruption (LDE) is most widely associated with the Hepatitis B, influenza and herpes zoster vaccine with patients experiencing the adverse reaction being significantly older than patients with other reported ADRS (mean = 47 years).[1] LDE has been documented in the context of Oxford-AstraZeneca,[2] Moderna[3] and also Pfizer-BioNTech[4] COVID-19 vaccine. This report however is the first to document LDE to a "booster" dose of the COVID-19 vaccination schedule. The effectiveness of the booster (third) dose of Pfizer-BioNTech-CoV-2 mRNA vaccine is established.[5] A recent review of booster COVID-19 mRNA vaccine adverse event reporting system (VAERS) looking at 39286 reports processed between September 22, 2021 and February 6, 2022 (in patients older than 18 years) found that 92.4% of VAERS were non serious (most commonly headache, fever and pain).[6] 64.3% of 332 588 patients who received the Pfizer-BioNTech booster vaccine reported an injection site reaction. No specific cutaneous ADR was reported.[6]

The patient in this case sustained a cutaneous ADR to the booster dose of the COVID-19 mRNA vaccine. The case highlights the importance of thorough drug history taking in patients presenting with cutaneous eruptions, histopathological correlation as well as for the need of appropriate documentation and adverse drug event reporting. In the setting of the COVID-19 pandemic, dermatologists may play a vital role in establishing reactions to COVID-19 booster vaccination (which may require the need for diagnostic "challenging") especially when considering the restricted freedom of movement of individuals who are not fully vaccinated.

Acknowledgement

The patient gave written informed consent for the publication of his case details as well as clinical photography.

Conflicts of interest

Dr Mintoff, Dr Pisani, Dr Livori, Dr Said Huntingford and Dr Baldacchino have no conflicts to declare.

Data availability statement

The data that support the findings of this manuscript are available from the corresponding author, DM, upon reasonable request.

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Cutaneous adverse effects of the available COVID-19 vaccines in India: a questionnaire-based study

Editor

Coronavirus disease (COVID-19) is a newly discovered highly communicable disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and its variants.[1]

We report diversified cutaneous side effects of the COVID-19 vaccines to describe various patterns and to understand temporal relationship between the first and second doses with cutaneous complications like local site reaction, defined as a wheal occurring at the site of immunization within 3 days from the day of immunization; delayed large local reaction, defined as wheal occurring 4 or more days post-immunization, depending on timing; and urticaria, defined as wheals distributed beyond the site of injection. Pain other than at the site of injection was defined as somatic pain in the peripheral region 2 cm away from injection site.

From 16 January 2021 to 16 August 2021, single or more cutaneous reactions to Covishield or Covaxin COVID-19 vaccines were studied in 1029 healthcare workers, which was first target population in vaccination drive, immunized at institutional

vaccination centre of central India, where one or more cutaneous reactions developed in 418 (86.7%) and 72 (13.3%) of the subjects in each group, respectively.

The most common reaction, local injection site reaction, occurred primarily after the Covaxin vaccination (50.8%) more than the Covishield (34.93%) at a median of 1 day (inter quartile range – IQR 0–1) after the second dose and lasted for a median of 3 days (IQR 1–3). Delayed local arm reactions occurred primarily after the Covishield vaccination (1.4%) more than the Covaxin (0.7%) at a median of 4 days (IQR 1–7) after the first vaccine and lasted for a median of 1.5 days (IQR 1–3). Urticaria occurred primarily after the Covishield vaccination at a median of 1 day after the first dose and earlier, that is <1 day (IQR 0–1) after the second dose. Pain other than at the site of injection occurred primarily after the Covishield vaccination (10.3%) more than the Covaxin (4.4%) at a median of 1 day (IQR < 1–3) after the second vaccine and lasted for a median of 3 days (IQR 1–10). Other cutaneous findings, which were less commonly seen with both vaccines, included are 18 reports of swelling at other sites, 3 pityriasis rosea-like reactions, 3 morbilliform rash, 1 petechiae, 1 pernio-like rash, and 1 urticarial vasculitis (Fig. 1) and hairfall in 94 patients (9.1%). The data for post-vaccination systemic reactions from various studies showed fever, fatigue, myalgia and headache to be most common,[2] which match our study – fever (49%), no reaction (37.4%), bodyache (31%), headache (23.2%), arthralgia (12%), myalgia (9.1%), chills (9%) being more common than sore throat (6%) and diarrhoea (1.6%; Table 1; Fig. 1).

Exact aetiology of immediate local reactions due to both vaccines is unclear. Excipients like polyethylene glycol[3,4] have been attributed to cause immediate hypersensitivity reactions and urticaria.

Delayed large local reactions were the most common, followed by local injection site reactions, urticarial eruptions, and morbilliform eruptions, according to Devon E. McMahon *et al.* study, which registered 414 cutaneous reactions to mRNA COVID19 vaccines from Moderna (83%) and Pfizer (17%).[5]

A study by Georgi Bogdanov *et al.* showed similar results, with injection-site reactions amongst the most frequent adverse events, which were mostly mild, usually self-limited and without serious consequences.[6] Although aetiology of delayed local reactions due to the Covishield vaccine is unclear, a delayed-type hypersensitivity reaction to the excipient polysorbate 80 might be the potential aetiology, similar to that seen in the study by Georgi Bogdanov *et al.*[6] Serious adverse events did not occur in any vaccine. Limitations include incomplete follow-up, delayed injection site reactions that needed long-term follow-ups and data were entered at one point of time only.

As per data collected from our study, we conclude that cutaneous reactions to COVID-19 vaccines Covishield and Covaxin are benign and self-limited and should not hamper vaccination.

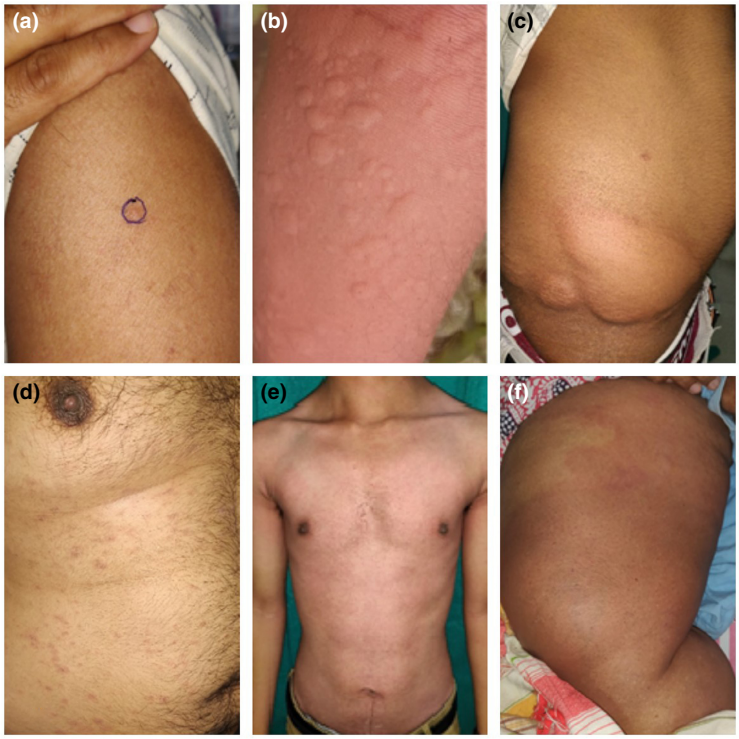

Figure 1 Cutaneous adverse reactions after administration of Covishield and Covaxin COVID-19 vaccines: (a) local injection site reaction over left upper arm. (b) Delayed injection site reaction over left forearm. (c) Urticarial wheals over right flank region. (d) Pityriasis rosea. (e) Morbilliform rash. (f) Urticarial vasculitis lesions over upper right thigh.

Table 1 Dermatologic and systemic findings reported after the COVID-19 vaccines. Patients who reported dermatologic findings after both vaccine doses are counted in both the first-dose and second-dose columns

Characteristics	Covishield first dose (*n* = 338) *n* (%)	Covishield second dose (*n* = 555) *n* (%)	Covaxin first dose (*n* = 20) *n* (%)	Covaxin second dose (*n* = 116) *n* (%)
Doses administered	338 (37.8%)	555 (62.2%)	20 (14.7%)	116 (85.2%)
Total cutaneous reactions	169 (50%)	249 (44.8%)	17 (85%)	55 (47.4%)
Local injection site reaction within 3 days (pain/swelling/redness)	116 (34.3%)	196 (35.3%)	12 (60%)	47 (40.5%)
Delayed injection site reaction from 4th day onwards (pain/swelling/redness)	12 (3.5%)	1 (0.1%)	0	1 (0.8%)
Swelling other than site of injection	8 (2.3%)	7 (1.2%)	2 (10%)	1 (0.8%)
Pain other than site of injection	31 (9.1%)	61 (11%)	0	6 (5.1%)
Urticaria within 24 h	2 (0.5%)	0	0	0
Urticaria after 24 h	1(0.2%)	1 (0.1%)	0	0
Pityriasis rosea	1 (0.2%)	2 (0.2%)	0	0
Pernio/chilblains	0	1 (0.1%)	0	0
Urticarial vasculitis	0	1 (0.1%)	0	0
Morbilliform rash	3 (0.3%)	0	0	0
None	169 (50%)	306 (55.1%)	3 (15%)	58 (50%)
Other	0	0	0	0
Systemic reactions in patients reporting cutaneous reactions				
Fever	193 (57.1%)	270 (48.6%)	8 (40%)	33 (28.4%)
Bodyache	106 (31.3%)	169 (30.4%)	4 (20%)	40 (34.4%)
Myalgia	19 (5.6%)	62 (11%)	0	13 (11.2%)
Headache	75 (22%)	137 (24.6%)	7 (35%)	20 (17.2%)
Arthralgia	39 (11.5%)	67 (12%)	8 (40%)	9 (7.7%)
Nausea	0	0	0	0
Chills	41 (12%)	40 (7%)	3 (15%)	8 (6.8%)
Lymphadenopathy	0	0	0	0
Diarrhoea	9 (2.6%)	8 (1.4%)	0	0
Sore throat	24 (7.1%)	28 (5%)	0	10 (8.6%)
Other	3 (0.8%)	3 (0.5%)	0	3 (2.5%)
None	107 (31.6%)	221 (39.8%)	4 (20%)	53 (45.6%)

Acknowledgement

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

Conflict of interest

None.

Funding source

None.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Disseminated herpes zoster in an immune-competent patient after SARS-CoV-2 vaccine (BNT162b2 Comirnaty, Pfizer)

Editor

Disseminated herpes zoster is defined as a generalized eruption of more than 10–12 extra-dermatomal vesicles after the onset of classic dermatomal herpes zoster,[1] often can be indistinguishable from first-time varicella infection (chickenpox). Causes of its apparition may be found in constitutive or temporal alteration, especially in healthy hosts, in cellular immunity.[2]

Here, we present a case of a healthy patient who developed a disseminated varicelloid eruption following vaccination with the Pfizer/BioNTech mRNA vaccine.

This case affected a 65-year-old north-Italian man who accessed our dermatological emergency room, referring sudden and pruriginous multiple pimples all over his body.

He stated that the rash started a week after receiving the SARS-CoV-2 mRNA vaccine's third dose (Pfizer, Comirnaty BNT162b2). She did not report any additional symptoms.

The past medical history is silent, and he has not taken drugs in chronic nor in a discontinuous manner in the last 2 months.

We observed approximately over 100 papules, vesicles and crusts no wider than 2 mm in diameter all over the body, from scalp to hand and feet, sparing only palmoplantar and face surfaces (Fig. 1a and b).

Suspecting a varicella eruption, we executed an in-office Tzanck test, showing the presence of giant multi-nucleate cells in the smear.

Biopsy of the most representative shoulder lesion showed a well-defined acantholysis above a blister cavity. These acantholytic keratinocytes also showed numerous inclusions, margination of the nuclear chromatin and multinucleation, typical effects of viral affections.

To rule out a first-time varicella infection caused by the varicella-zoster virus (VZV), we asked permission to check the

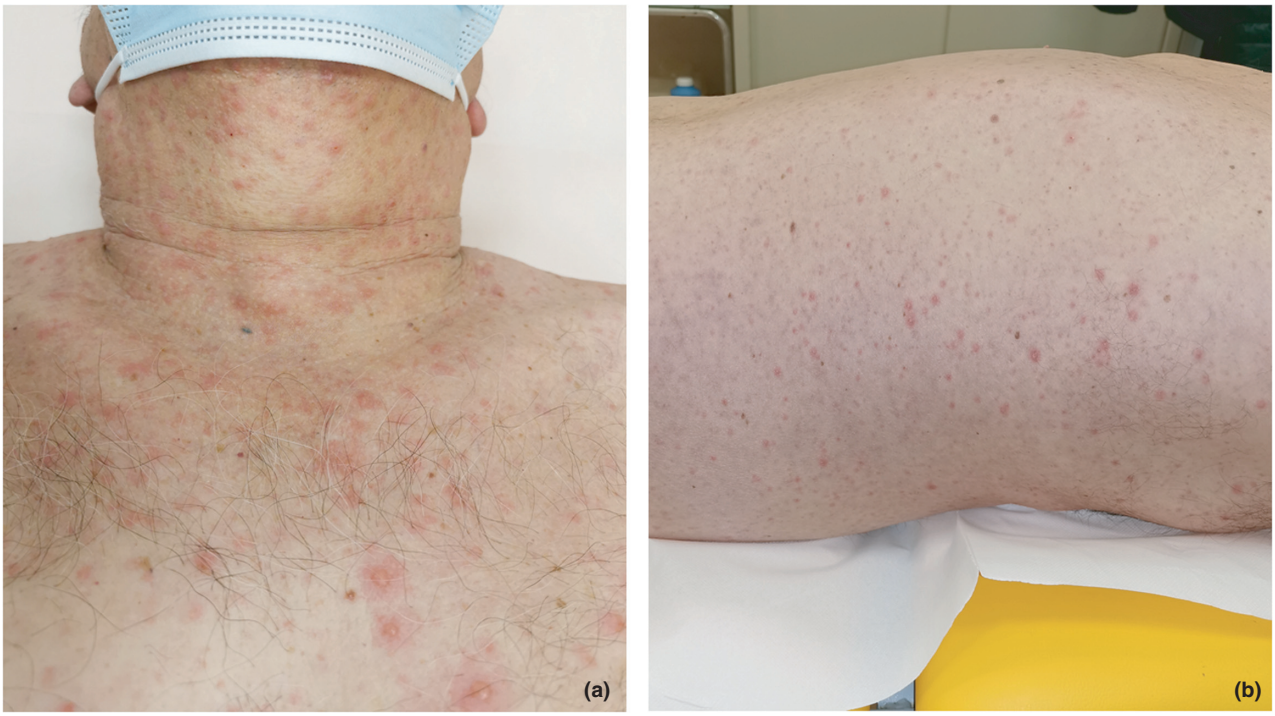

Figure 1 Macroscopic pictures of the lesions distributed on the patient's body; (a) decollete; (b) Side of the thorax.