Table 1 Reports of ENL following vaccination

Vaccine	On MDT	Incidence	Time interval	Treatment	Resolution
Smallpox vaccine[2]	NA	New ENL in 5 patients (7%) and worsening of existing ENL in three patients (4%) $n = 73$	NA	NA	NA
Killed ICRC bacilli[3]	NA	2 patients (4.3%) $n = 46$	3–4 weeks	NA	NA
Mycobacterium indicus pranii vaccine[4]	Yes	NR $n = 1$	10 days	Prednisolone 40 mg NSAIDs	Yes
Influenza[5]	Yes	NR $n = 1$	Month	Prednisone 20 mg	Yes

MDT, multidrug therapy; NA, not applicable; NR, not relevant. Time interval refers to time interval from vaccination until appearance of symptoms.

superimposed upon chronic inflammation and heavy bacterial load, as demonstrated in our patient's biopsy. Other clinical manifestations are fever, headache, tender lymphadenopathy, orchitis, iridocyclitis and painful joints. ENL is the first manifestation of Hansen's disease, coming to medical attention, as in our case, in a third of the patients.[1] ENL can be precipitated by vaccination, pregnancy, lactation or current infection.[1] Reports of ENL following a vaccination are scarce, but include several cases following smallpox vaccination,[2] ICRC,[3] MIP[4] and influenza[5] vaccines, as detailed in Table 1.

The BNT162b2 mRNA COVID-19 Vaccine is a lipid nanoparticle-formulated, nucleoside-modified mRNA vaccine encoding the prefusion spike glycoprotein of SARS-CoV-2, the virus that causes COVID-19. Adverse effects include pain, swelling and erythema at injection site, axillary lymphadenopathy and systemic symptoms. This is the first case report of ENL emergence after BNT162b2 mRNA COVID-19 vaccine. The early diagnosis and treatment in our patient were essential to minimize the likelihood of disability induced by this reaction, as this is often not reversible.

As vaccination rates in leprosy endemic areas rise, so may the likelihood of higher rates of ENL. Attention should be given by health care providers.

Acknowledgement

The patient in this manuscript has given written informed consent to the publication of his case details.

Conflicts of interest

The authors have no conflicts of interest to disclose.

Funding

None.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

T. Fachler,[1] K. Olshtain-Pops,[2] L. Horev[1,*]

[1]Department of Dermatology, Hadassah Medical Center, Hebrew University of Jerusalem, The Faculty of Medicine, Jerusalem, Israel, [2]Department of Infectious Diseases, Hadassah Medical Center, Hebrew University of Jerusalem, The Faculty of Medicine, Jerusalem, Israel

*Correspondence: L. Horev. E-mail: liran.horev@gmail.com

References

1 Kahawita IP, Wailder SL, Lockwood DNJ. Leprosy type 1 reactions and erythema nodosum leprosum. *An Bras Dermatol* 2008; **83**: 75–82.
2 Saha K, Mittal MM, Ray SN. Consequences of smallpox vaccination in leprosy patients. *Infect Immun* 1973; **8**: 301–308.
3 Bhatki WS, Chulawala RG, Bapat CV, Deo MG. Reversal reaction in lepromatous patients induced by a vaccine containing killed ICRC bacilli—A report of five cases. *Int J Lepr Other Mycobact Dis* 1983; **51**: 466–472.
4 Kothari R, Vashisht D, Pudasaini N, Venugopal R, Paliwal G. Recurrent erythema nodosum leprosum associated with mycobacterium indicus pranii vaccine in a case of leprosy: a rare paradox. *J Eur Acad Dermatol Venereol* 2021; **35**: e391–e393.
5 Sandre MK, Poenaru SM, Boggild AK. Erythema nodosum leprosum triggered by antecedent influenza vaccine and respiratory tract infection. A case report. *Cutan Med Surg* 2019; **23**: 114–116.

DOI: 10.1111/jdv.18035

Maskne prevalence and associated factors in Irish healthcare workers during the COVID-19 pandemic

Editor,

In early 2020, mask usage was mandated for healthcare workers (HCWs) to limit the transmission of COVID-19.[1,2] Since then, dermatoses related to personal protective equipment (PPE) have become well-recognized and widely reported, predominantly related to pressure-related damage and irritant contact dermatitis (ICD).[3] A

previous Irish study showed that 82% of staff developed ICD, with 26% reporting PPE-related facial dermatoses.[4] We sought to evaluate the prevalence and contributory factors in 'maskne' development amongst Irish HCWs during the COVID-19 pandemic.

In April-May 2021, 700 self-administered questionnaires were distributed to staff in three university hospitals in Cork, Ireland. The questionnaire enquired about history of acne, PPE exposure, maskne development, contributing/alleviating factors and whether advice/treatment was sought.

In total, 337 completed the questionnaire (48% response rate). Most (84.6%, $n = 285$) were female. Forty-nine per cent were aged between 20 and 30 years, 27.6% between 31 and 40 years and 23.3% were over 40 years. Nursing staff comprised 64.1% of participants, doctors 22%, healthcare assistants (HCAs) 4.7% and allied health professionals 3.9%. Most respondents (72.5%) worked on general wards, 10% on COVID-19 wards, 4.5% in intensive care units and 3.2% in emergency departments.

A quarter (26%, $n = 87$) had a previous history of acne, and a quarter (25.5%, $n = 84$) had a family history of acne (first degree relative). The majority were White (82.7%; $n = 278$) followed by South Asian (7.7%; $n = 26$), East Asian (3.3%; $n = 11$) and Black (2.2%; 7). As per the Fitzpatrick scale, most (52.7%) participants reported type I (19.2%, $n = 64$) or type II (33.5%, $n = 112$) skin. More darkly pigmented skin types were reported in 47.8% [type III 22.5% ($n = 75$); type IV 13.8% ($n = 46$); type V 9.9% ($n = 33$) and 1.2% ($n = 4$) type VI].

Over half (53.4%, $n = 180$) of respondents reported developing maskne since the onset of the COVID-19 pandemic. The majority were (85.5%, $n = 154$) self-reported papulopustular eruptions, 46% ($n = 83$) comedonal breakouts and 22.5% ($n = 44$) nodulocystic lesions. Only 12.8% of HCW with maskne sought medical advice (Fig. 1).

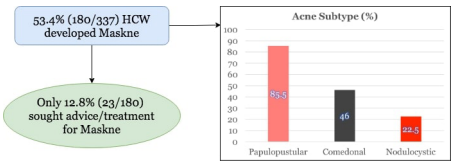

Figure 1 Prevalence of maskne in this cohort ($n = 337$), with rates of specific acne subtypes (papulopustular, comedonal and nodulocystic) and advice/treatment-seeking behaviour.

Table 1 Odds ratios of various factors for maskne development following univariable analysis

Factor	Odds ratio	95% confidence interval	*P* value
Female gender	4.26	2.11–8.20	<0.001
Age <30 years	1.99	1.28–3.1	0.002
Previous acne	2.16	1.28–3.64	0.04
Family history of acne	1.7	1.02–2.89	0.04
'Hot and sweaty' environment	1.89	1.14–3.15	0.014
Emollient under mask	1.89	1.21–2.95	0.005
Face shields/goggles	1.59	0.97–2.60	0.031

Factors associated with increased rates of maskne included female gender (OR 4.26; 95% CI 2.11–8.20; $P < 0.001$), younger age [64.1% of 20–30 year olds compared with 48.8% and 46.7% of the 31–40 and >40 year categories respectively ($P = 0.037$)], history of acne (OR 2.16 95% CI 1.28–3.64; $P = 0.004$), family history of acne (OR 1.7 95% CI 1.02–2.89; $P = 0.04$), working in a 'hot and sweaty' environment (OR 1.89; 95% CI 1.14–3.15; $P = 0.014$), use of emollients under the masks (OR 1.89; CI 1.21–2.95; $P = 0.005$) and use of face shields and goggles (OR 1.59; 95% CI 0.97–2.60; $P = 0.031$; Table 1). There was no correlation with duration of mask use ($P = 0.097$), number of shifts worked per week ($P = 0.52$), job description ($P = 0.793$), use of hormonal contraception amongst female staff members ($P = 0.474$), Fitzpatrick skin type ($P = 0.844$) or ethnicity ($P = 0.22$).

Over half of our HCWs developed maskne since the onset of the COVID-19. Our findings suggest that female HCW, younger HCW and those with a personal or family history of acne are at increased risk. The reduction in duration of usage may not prevent maskne, but application of emollients under masks should not be recommended.[5]

Limitations of our study include self-reporting of maskne. Our study was vulnerable to responder bias. However, with 55% of the 48% respondents reporting maskne, even if all non-respondents did not develop maskne, the overall prevalence would still have been at least 26%. We did not account for confounding variables such as the use of other comedogenic products, such as make-up.

This study highlights the pervasiveness of maskne in the COVID-19 era. Most HCW with maskne do not seek medical attention, so the impact of this occupational dermatosis may be under-estimated.

Conflict of interest

None declared by LK, COC, GOB, COB, JG and JB.

Data Availability Statement

The data are available on request.

L.F. Kiely,[1] C. O'Connor,[1,2,*] G. O'Briain,[2] C. O'Briain,[2] J. Gallagher,[3] J.F. Bourke[1,2]

[1]Department of Dermatology, South Infirmary Victoria University Hospital, Cork, Ireland, [2]Department of Medicine, University College Cork, Cork, Ireland, [3]Department of Occupational Medicine, Cork University Hospital, Cork, Ireland

*Correspondence: C. O'Connor. E-mail: cathal.oconnor@ucc.ie

References

1 World Health Organisation. Coronavirus disease (COVID-19) advice for the public: When and how to use masks [Internet]. URL https://www.who.

int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/when-and-how-to-use-masks (last accessed: 9 February 2022).
2 Centers for Disease Control and Prevention Your guide to masks [Internet]. URL https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/about-face-coverings.html (last accessed: 19 October 2021).
3 O'Neill H, Narang I, Buckley DA *et al*. Occupational dermatoses during the COVID-19 pandemic: a multicentre audit in the UK and Ireland. *Br J Dermatol* 2021; **184**: 575–577.
4 Kiely LF, Moloney E, O'Sullivan G, Eustace JA, Gallagher J, Bourke JF. Irritant contact dermatitis in healthcare workers as a result of the COVID-19 pandemic: a cross-sectional study. *Clin Exp Dermatol* 2021; **46**: 142–144.
5 Teo W-L. Diagnostic and management considerations for "maskne" in the era of COVID-19. *J Am Acad Dermatol* 2021; **84**: 520–521.

DOI: 10.1111/jdv.18054

Pityriasis rubra pilaris (type I) following ChAdOx1 COVID-19 vaccine: A report of two cases with successful treatment with oral isotretinoin

Dear Editor,

Pityriasis rubra pilaris (PRP) is a rare chronic papulosquamous dermatosis that can be triggered by multiple factors (e.g. drugs, infection) and influenced by a genetic background.[1] PRP was also reported following vaccination (e.g. measles-mumps-rubella, oral poliovirus, diphtheria-pertussis-tetanus and influenza).[2] Multiple cutaneous adverse events were associated with COVID-19 and its vaccines, to date, there are four reports of PRP related to COVID-19 vaccination.[3–6] Here, we report two cases of PRP after ChAdOx1 (AstraZeneca) vaccine, compare them with other similar cases and highlight a satisfactory response with oral isotretinoin.

Case 1; A 31-year-old man presented with itching salmon to erythematous scaly plaques on his upper trunk, upper and lower extremities for 60 days (Fig. 1a), sparing the periumbilical area, with palmoplantar keratoderma (Fig. 1b), without nail involvement. On 30 May 2021, he received the first dose of the immunization for SARS-CoV-2 with AstraZeneca vaccine. The patient noticed low fever and headache in the same day. After 10 days, he noticed a cutaneous rash on abdomen and face that progressed to dorsum, upper and lower limbs. There was no history of drug intake, except losartan 50 mg QD for systemic arterial hypertension during the past four years. Histopathological analysis was compatible with pityriasis rubra pilaris (Fig. 1d). The patient was treated with isotretinoin 30 mg QD and emollients for three months with total remission.

Case 2; A 42-year-old man was vaccinated with two doses of AstraZeneca vaccine, without intercurrences. After 8 days of the second dose, scaly reddish plaques were observed on his face and then progressed all over the body in one week, leaving healthy skin areas, especially on the trunk, with a citrine colour (Fig. 1c), without nail involvement or palmoplantar hyperkeratosis. There was no history of drug intake or comorbidities. The histopathological analysis was analogous to the first case (Fig. 1d) and he was treated with isotretinoin 40mg/day in two months with partial clearance and then, 20mg/day in the third month with mild erythema.

The causal relationship between COVID-19 vaccines and cutaneous immunological reactions is still not understood, but they can be due to an upregulated inflammatory immunological pathway or cross-reactivity between vital or adjuvant molecules and self-antigens.[4]

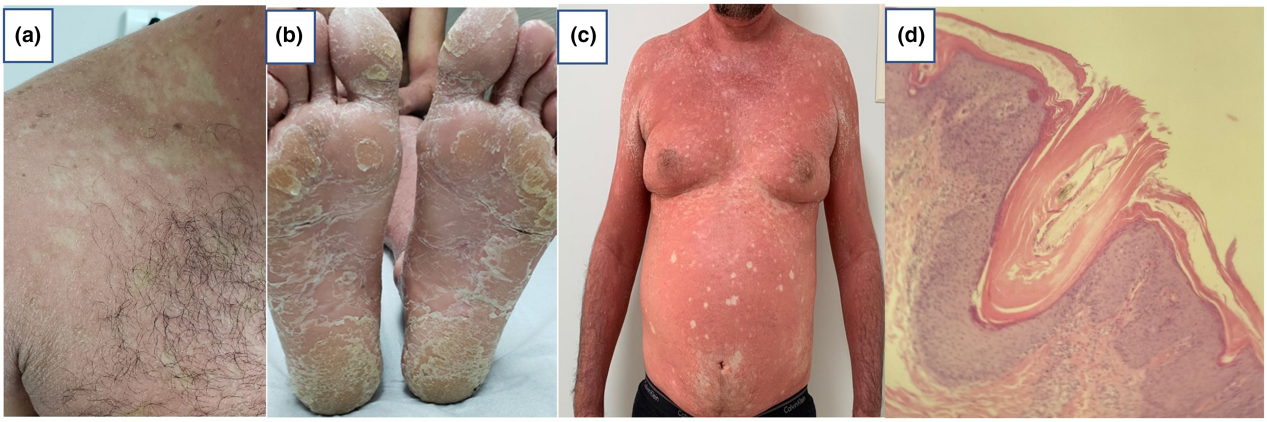

Figure 1 Clinical and histopathological features of PRP induced by COVID-19 vaccination (ChAdOx1 - AstraZeneca). (a) Case 1. Erythematous scaly plaques with areas of healthy skin; (b): Case 1. Plantar hyperkeratosis; (c). Case 2. Erythematous-citrine scaly plaques all over the body with evident areas of healthy skin in the trunk; (d): Follicular plugging, alternating orthokeratosis and parakeratosis (vertical and horizontal), epidermis with broader rete ridges than expected in a psoriasiform reaction (HE, 200X).

