Erythema nodosum leprous post-COVID-19 vaccination: endemic while pandemic

Editor

Leprosy is an important global health concern. Erythema nodosum leprosum (ENL) is a type 2 immunological reaction, indicative of bacterial-rich leprosy. We report a case of ENL arising following Pfizer BNT162b2 mRNA COVID-19 Vaccine.

A 32-year-old man, born in Thailand, who had been living in Israel for 4 years, was referred to the ER due to the appearance of a diffuse nodular rash across his trunk and extremities (Fig. 1a). The man was in good general health, with no family history of dermatological diseases. The rash appeared 14 days following the first dose of Pfizer’s BNT162b2 mRNA COVID-19 vaccine. On physical examination (Fig. 1a), erythematous nodules were present in a general distribution over his trunk, extensor surfaces of both upper and lower extremities and face. A few hyperpigmented patches were present on the back. There were no systemic symptoms, lymph nodes were not enlarged, and sensory loss or nerve thickening were not observed. Blood examination showed mild leucocytosis 11.8K with neutrophils 9.9K (83.9%), haemoglobin 12.7 gr% (13.9–17.7 gr%) and elevated CRP 8 mg/dL (normal range 0–0.5 mg/dL). Differential diagnosis included erythema nodosum, subcutaneous Sweet syndrome and other panniculitides. Biopsies for pathology and tissue culture were taken. H&E staining showed preserved epidermis, oedematous papillary dermis and superficial and deep perivascular and diffuse mononuclear infiltration with numerous neutrophils and several small clusters of histiocytes, forming mainly indistinct granulomas. One clear granuloma without necrosis was also observed (Fig. 1b). Alcian blue and PAS stains were negative. Ziehl Neelsen stain showed many acid fast bacilli. Skin smears sampled from several locations, including ears, elbows and knees, as well as from the nodular lesions, were examined by PCR for Mycobacterium leprae bacilli and found to be highly positive. Based on these findings, the case was diagnosed as erythema nodosum leprosum, and WHO-MDT (multi-drug therapy), including rifampicin, clofazimine and dapsone, was initiated.

Leprosy (Hansen’s disease) is caused by two types of acid-fast positive bacilli, M. leprae or M. lepromatosis. Immunological reactions, type 1 and 2, are systemic inflammatory complications that may occur before, during or even years after treatment has been completed. ENL type 2 reaction is characterized by a sudden eruption of numerous painful nodules, typically on the extensor surfaces of the extremities and on the face. They last for a few days and are replaced by crops of new lesions. Histology shows neutrophilic infiltration

References
1. Sun Q, Fathy R, McMahon DE, Freeman EE. COVID-19 vaccines and the skin: the landscape of cutaneous vaccine reactions worldwide. Dermatol Clin 2021. https://doi.org/10.1016/j.dcl.2021.05.016.
2. 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.
3. Mathieu RJ, Cobb CBC, Telang GH, Firoz EF. New-onset pustular psoriasis in the setting of severe acute respiratory syndrome coronavirus 2 infection causing coronavirus disease 2019. JAAD Case Rep 2020; 6(12): 1360–1362. https://doi.org/10.1016/j.jder.2020.10.013.
4. Bostan E, Elmas L, Yel B, Yalici-Armagan B. Exacerbation of plaque psoriasis after inactivated and BNT162b2 mRNA COVID-19 vaccines: two cases. J Eur Acad Dermatol Venereol 2021; 35: e632-e634.
5. Sotiriou E, Tsentemeidou A, Bakirtzi K, Lallas A, Ioannides D, Vakirlis E. Exacerbation of plaque psoriasis following Oxford-AstraZeneca COVID-19 vaccine. Clin Exp Dermatol 2021; https://doi.org/10.1111/ced.14941.
6. Perna D, Jones J, Schadt CR. Acute generalized pustular psoriasis exacerbation following second dose of Pfizer-BioNTech BNT16B2b2 COVID-19 mRNA vaccine. JAAD Case Rep 2021; https://doi.org/10.1111/jdv.17582.
7. Pesquie D, Lopez-Trujillo E, Marcantonio O, Gimenez-Arnau AM, Pujol RM. New-onset and exacerbations of psoriasis after mRNA COVID-19 vaccines: two sides of the same coin? J Eur Acad Dermatol Venereol 2022; 36: e80–e81.
8. Awada A, Abdullah L, Kurban M, Abbas O. Comment on ‘De novo generalized pustular psoriasis following Oxford-AstraZeneca COVID-19 vaccine’: possible role for Type I interferons. Clin Exp Dermatol 2021; https://doi.org/10.1111/ced.14941.
9. Krajewski PK, Matusiak Ł, Szepietowski JC. Psoriasis flare-up associated with second dose of Pfizer-BioNTech BNT162b2 COVID-19 mRNA vaccine. J Am Acad Dermatol 2021; 85: e15110. Epub ahead of print. PMID: 34427024.
10. 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.
11. Sotiriou E, Tsentemeidou A, Bakirtzi K, Lallas A, Ioannides D, Vakirlis E. Exacerbation of plaque psoriasis following Oxford-AstraZeneca COVID-19 vaccine. Clin Exp Dermatol 2021; https://doi.org/10.1111/ced.14941.
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. ENL can be precipitated by vaccination, pregnancy, lactation or current infection. Reports of ENL following vaccination are scarce, but include several cases following smallpox vaccination, 2 ICRC, 3 MIP 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.

---

**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%)                  | 3–4 weeks     | NA            | NA         |
| Mycobacterium indicus pranii vaccine 4 | Yes | n = 1                              | 10 days       | Prednisolone 40 mg | Yes       |
| Influenza 5                     | Yes    | 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.

---

**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, Vashish 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**

T. Fachler,1 K. Olshtain-Pops,2 L. Horev1,∗

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

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

---

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

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