

More than 90% of cases of AGEPE are drug-induced.⁶ A case series of childhood AGEPE reported 2 cases of vaccine-related AGEPE,⁷ while a pregnant woman of 10-week gestation developed AGEPE 1 day after influenza vaccination.⁸ Tozinameran consists of lipid and mRNA nanoparticles. AGEPE may be induced via the RNA molecule, lipid vehicle or the eventual proteins arising from the translation of RNA. The propensity for components of the RNA vaccine to induce non-allergic cutaneous reactions remains insufficiently characterized. Preliminary case series have documented delayed large local reactions, termed 'COVID arm',² and various other reactions in a registry-based report of 414 cases.⁹ These delayed cutaneous manifestations may be related to the host immune response instead of true vaccine allergies.

We opine that most delayed, mild non-IgE-mediated cutaneous reactions do not contraindicate further doses of the same vaccine, as these reactions are often transient and self-limiting, where the benefits of a completed vaccination schedule outweigh the potential morbidity following such reactions. Knowledge of both allergic and non-allergic cutaneous reactions to various COVID-19 vaccines is useful in the current mass vaccination exercises worldwide.

Consent for publication

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Conflict of interest

The authors have no conflicts of interest to declare.

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Psoriasis exacerbation after COVID-19 vaccination: a report of 14 cases from a single centre

Editor,

High COVID-19 vaccination rates are a prerequisite for the establishment of herd immunity.¹ Psoriasis patients seem to be more inclined to undergo COVID-19 vaccination, compared with matched controls suffering from other skin diseases and receiving immunosuppressive treatment (odds ratio, 1.32; 95% confidence interval: 1.28–1.36).¹ Twenty-one per cent of 713 asked psoriasis patients declared fear of potential postvaccination flare of their skin disease to be holding them back from receiving a COVID-19 vaccine.¹ Actual knowledge of the probability of this negative outcome occurring has largely been inadequate. As a number of vaccinated psoriasis patients steadily increase, the first data regarding this issue have been seeing the light of day.

Three European Medicines Agency-approved SARS-CoV-2 vaccines (Pfizer mRNA BNT162b2; Moderna mRNA-1273; and AstraZeneca-Oxford AZD1222) have been administered to the Greek population from 27 December 2020 to 10 May 2021 (study lock date). Healthcare providers, followed by older individuals and those who were at the risk of severe COVID-19 infection due to comorbidities (including psoriasis under immunosuppressive treatment), were the first to be vaccinated in Greece.

Fourteen patients (mean age, 66.93; standard deviation, 9.68; females, 64.29%) (Table 1) presented to the emergency department of our hospital from 1 January to 10 May 2021 with sudden onset of a generalized papulosquamous rash, which was clinically diagnosed as psoriasis (Fig. 1). Of these, nine patients had had known mild psoriasis (mean duration, 16.39 years; standard deviation, 5.23), which had been left without treatment for over a year. Five patients had only been receiving topical treatment (steroids, calcipotriol/betamethasone), with which

Table 1 Patient demographics, vaccination details and psoriasis flare details

	Sex	Age	Vacc	Dose	Days	PASI	Pstype	Nails	Treatment
1	F	69	AZ	2	8	10.2	Plaque	Yes	PUVA
2	F	82	Moderna	2	10	6.7	Plaque	No	Calcip/betam
3	F	62	Pfizer	2	6	5.4	Plaque	No	Calcip/betam
4	M	73	Pfizer	2	7	8.2	Plaque	No	Calcip/betam
5	M	66	AZ	1	22	14.4	Plaque	Yes	Risankizumab
6	F	62	AZ	2	13	12.4	Plaque	Yes	Apremilast
7	F	78	Pfizer	2	5	6.8	Plaque	No	Calcip/betam
8	F	64	AZ	2	6	11.2	Plaque	No	PUVA
9	M	69	AZ	1	32	9.2	Plaque	Yes	nbUVB
10	M	83	Pfizer	2	9	6.6	Plaque	No	Calcip/betam
11	F	61	AZ	2	3	5.9	Guttate	No	nbUVB
12	M	49	Pfizer	2	10	13.1	Plaque	Yes	Ixekizumab
13	F	55	Pfizer	2	7	10.2	Plaque	Yes	Cyclosporine
14	F	64	AZ	2	7	16.8	Plaque	No	Guselkumab

F, female; M, male; Vacc, vaccine type; AZ, AstraZeneca-Oxford AZD1222; Moderna, Moderna mRNA-1273; Pfizer, Pfizer mRNA BNT162b2; Dose, number of doses after which psoriasis flare occurred; PASI, Psoriasis Area and Severity Index score at presentation in our department following the psoriasis flare; Pstype, psoriasis type; Nails, Presence of nail psoriasis; Calcip/betam, topical calcipotriol/betamethasone combination.

they adequately controlled their disease. Psoriasis flare was treated with topical calcipotriol/betamethasone (five cases) and systemic agents or phototherapy (nine cases) (Table 1). Most patients were older adults, which quite possibly reflects the vaccination scheme followed in Greece. Almost all patients

experienced an exacerbation of their psoriasis relatively soon (meantime, 10.36 days; standard deviation, 7.71) after the second vaccine dose. Notably, there was no difference between the types of the vaccine (50% mRNA technology vaccines and 50% adenovirus vaccine) used. Similarly, PASI was not statistically different in different vaccine groups ($P = 0.073$, 95% confidence interval: $-0.36-6.96$).

Significant worsening of pre-existing chronic mild psoriasis and new-onset, especially guttate, disease after influenza vaccination have both been described before.^{2,3} Vaccination against influenza virus during the COVID-19 pandemic was also linked with psoriasis exacerbation in four cases.⁴ Three of these patients had been on biologic agents and one on topicals at the time of vaccination.⁴ A recent Italian report, however, documented three cases of psoriasis patients on apremilast, who were vaccinated against COVID-19 with either Pfizer mRNA BNT162b2 or AstraZeneca-Oxford AZD1222 vaccine (two doses) and did not experience any worsening of their skin disease.⁵ Similarly, another Italian paper reported the uneventful COVID-19 vaccination of three healthcare workers with psoriasis under biologic agents (secukinumab, ixekizumab, risankizumab) with Pfizer mRNA BNT162b2.⁶ Potentially, systemic treatment confers some sort of protection against vaccine-mediated flares of psoriasis, whereas patients receiving no treatment or only topical treatment are more prone to the activation of an inflammatory process leading to new and often extensive psoriasis lesions. It has been suggested that a Th17-mediated immunologic response underlies the sudden worsening of psoriasis postinfluenza vaccination.²

The findings of our study suggest an association between COVID-19 vaccinations with three widely used vaccines



Figure 1 Sudden psoriasis flare in a female patient who had been receiving topical treatment for mild plaque psoriasis for years, after AstraZeneca-Oxford AZD1222 vaccine for COVID-19. New lesions appeared in the previously uninvolved areas. Pre-existing nail psoriasis worsened.

irrespective of manufacturing technology. In our opinion, psoriasis patients should be advised to be vaccinated against SARS-CoV-2 and contact their healthcare provider in case they notice a flare of their disease.

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Erythema gyratum repens after COVID-19

Editor

Erythema gyratum repens (EGR) is considered a paraneoplastic syndrome characterized by the eruption of expanding, concentric, erythematous patches and plaques.^{1,2} The reaction

primarily affects older individuals and has a strong association with internal malignancy; such an association presents in approximately 82% of cases.^{1–3} The most commonly associated malignancy is lung cancer, followed by oesophageal and breast cancer.³

The exact mechanism by which EGR develops is currently unknown.^{4,5} Rongioletti *et al* evaluated 112 original cases of EGR from the literature.¹ Among these, 70% were associated with an underlying neoplasm, 30% were non-paraneoplastic, and 29 cases have been considered as different dermatoses mimicking EGR ('EGR-like' eruption).¹

In this article, we report the first case of a patient with EGR after COVID-19.

An 83-year-old White man presented with a 3-day history of a rash affecting the abdomen and lower limbs (Fig. 1). The rash was described as red, burning, itchy and painful. On examination, distinctive serpiginous scaling patches with wood-grained appearance were noted on the thighs and trunk. Dermoscopy of the plaques revealed erythematous background with purplish tinge in a linear pattern (Fig. 2). He reported no known allergies and denied recent irritation or substance exposure to the affected area. Treatment included daily over-the-counter hydrocortisone cream but failed to provide symptomatic relief.

Two weeks before, he had experienced persistent dry cough, overall fatigue, myalgia, muscle weakness, headache and fever with accompanying dysgeusia and anosmia lasting several days. At that time, reverse transcription–polymerase chain reaction (RT-PCR) by nasopharyngeal swab testing was performed yielding positive result for SARS-CoV-2 and confirming COVID-19.

There was no significant lymphadenopathy. Systemic examination was within normal limits. Routine investigations including complete blood picture, chest and skull skiagram were unremarkable. All other blood parameters including blood culture, serology for antinuclear antibody, syphilis and infections due to hepatitis B, C and A viruses and HIV detected no abnormality. Chest radiography and computerized tomogram of the thorax were normal. The lactic dehydrogenase level was normal. Histological examination of a skin biopsy showed a mild superficial perivascular dermatitis with focal spongiosis (Fig 2).

The patient totally recovered from dry cough, fatigue, myalgia and muscle weakness after 10 days with complete resolution of the EGR manifestations (Fig. 1).

The clinical appearance of EGR is quite unique, often described as an extensive eruption of concentric erythematous coils arranged in parallel across the body.^{3,4} It should also be noted that the associated lesions are not static in appearance.² As observed in our patient, the eruption can migrate through the affected area but tends to spare the hands, feet and face and is invariably pruritic.