(Fig. 1). State SVI growth rates for the term 'tanning bed' between March and June 2020 ranged from 0.0 (Hawaii, Rhode Island) to 1011.1 (Indiana) (Fig. 2), with mean SVI growth being notably greater in the 25 states with the lowest SI than in those with the highest (321.3 vs. 188.2, $P = 0.01$) (Table 1).

The data indicate an overall national decrease in indoor tanning searches during the initial surge in COVID-19 cases. By contrast, outdoor tanning terms experienced record peak interest in the summer of 2020, which may indicate high outdoor engagement despite the ongoing pandemic. This reinforces the important and established role of public health messaging in promoting sun-safe outdoor practices, even during periods of quarantine.

Interest in indoor tanning varied dramatically depending on the stringency of state-imposed COVID-19 restrictions. Although restrictions cannot be directly linked to indoor tanning interest, aggressive states ordered tanning salons closed for months (e.g. Connecticut) whereas others allowed salons to remain open (e.g. South Dakota).[3,4] Restrictive tanning legislation was previously found to be most effective at modulating public interest in indoor tanning.[5] States with more stringent restrictions also demonstrated greater encouragement of social distancing and had more expansive public information campaigns, which may also have contributed to the lower interest in indoor tanning.

The study has several limitations. First, tanning interest is driven by personal, societal and environmental factors, making it difficult to directly attribute the exhibited trend to the pandemic (e.g. fear of exposure to COVID-19) or the associated restrictions (e.g. closure of tanning salons). In addition, the SI relies on metrics that may not appreciably impact tanning behaviour (e.g. public event cancellations). Despite these shortcomings, this study is the first to characterize public interest in tanning during COVID-19, and further supports a role for public policy and legislation in influencing tanning practices.

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Conflict of interest: H. Feng has worked as a consultant for Cytrellis Biosystems and Soliton. The other authors declare that they have no conflicts of interest.
Accepted for publication 27 May 2021

References

1 Reed DD. Google search trends for tanning salons: temporal patterns indicate peak interest in mid spring. *J Am Acad Dermatol* 2015; **73**: 1055–6.
2 Bloom R, Amber KT, Hu S, Kirsner R. Google search trends and skin cancer: evaluating the US population's interest in skin cancer and its association with melanoma outcomes. *JAMA Dermatol* 2015; **151**: 903–5.
3 South Dakota Department of Labor and Regulation, South Dakota Cosmetology Commission. 2020. Available at: https://dlr.sd.gov/cosmetology/default.aspx (accessed 15 December 2020).
4 Connecticut Department of Economic and Community Development. Sector rules for reopen. 2020. Available at: https://portal.ct.gov/DECD/Content/Coronavirus-Business-Recovery/Sector-Rules-for-Reopen (accessed 15 December 2020).
5 Singh G, Feng H, Geronemus R. Evaluating the Impact of indoor tanning legislation in the United States. *Dermatol Surg* 2019; **47**: 303–5.

Radiation recall dermatitis triggered by inactivated COVID-19 vaccine

doi: 10.1111/ced.14786

Dear Editor,

Radiation recall dermatitis (RRD) is an acute inflammatory reaction that is localized to an area of skin previously exposed to radiation and is known to be triggered by various systemic drugs. It can be observed weeks to years after cessation of radiotherapy, and the time interval between administration of the reaction-triggering drug to the onset of lesions varies from minutes to days.[1] RRD is characterized by erythema, oedema, urticaria-like lesions, desquamation, vesiculation and, in severe cases, necrosis and ulceration.[2] RRD is mainly triggered by cytotoxic chemotherapeutics, but there are also several reports with antibiotics, monoclonal antibodies and immunomodulators.[1–3] We report a patient with melanoma who developed RRD following the first dose of COVID-19 vaccine.

A 60-year-old woman with a history of melanoma presented with a sudden-onset painful lesion on the medial side of her right leg. The patient's medical history revealed that she had received hypofractionated radiotherapy of 30 Gy over 10 days to four separate regions on her right leg 2 years and 3 months previously. She was still on the dabrafenib/trametinib combination therapy that had been started just over 2 years before her presentation.

Physical examination revealed a well-demarcated, erythematous, indurated plaque confined to an area of previous irradiation (Fig. 1). There were no active lesions on other irradiated parts of her right leg. The patient reported no trauma or application of any topical agent in the area where the existing erythematous lesion was located. She also had not started any new systemic medication, but she had received her first dose of a COVID-19

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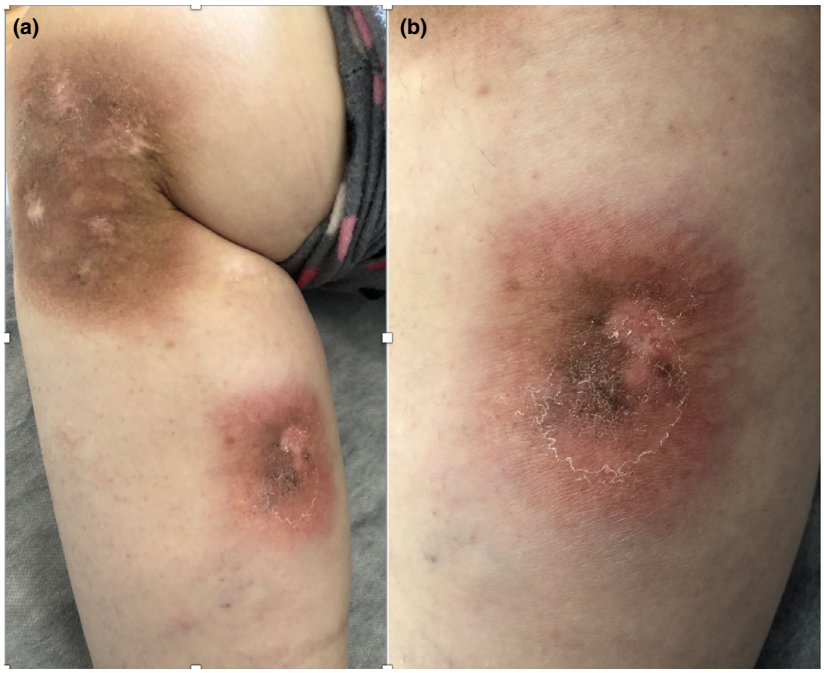

Figure 1 (a) Right leg with areas of previous irradiation, showing postinflammatory hyperpigmentation on the knee and recently developed erythema on the medial aspect of the lower part; (b) closer view of the well-demarcated, erythematous, indurated plaque.

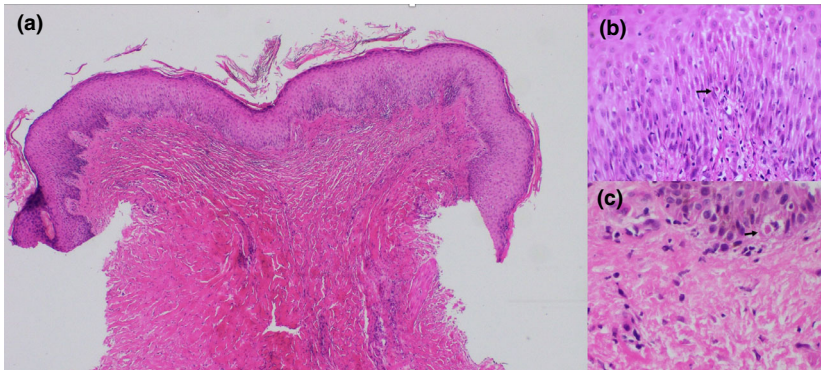

Figure 2 (a) Increased dermal collagenization and fibrosis, secondary to previous radiotherapy; (b,c) epidermal intercellular oedema, lymphocyte exocytosis and rare necrotic keratinocytes (arrow). Haematoxylin and eosin, original magnification (a) × 40; (b,c) × 200.

vaccine, the inactivated CoronaVac vaccine (Sinovac, Beijing, China), 5 days before the onset of erythema.

Histological 5-mm punch biopsy taken from the erythematous plaque showed epidermal intercellular oedema, lymphocyte exocytosis and rare necrotic keratinocytes as well as increased dermal collagenization and fibrosis (Fig. 2). Based on these findings, our patient was diagnosed with RRD triggered by COVID-19 vaccine.

A wide range of cutaneous manifestations of SARS-CoV-2 infection have been described to date; however, data concerning COVID-19 vaccine-associated cutaneous findings have only started to emerge recently. The reported cutaneous manifestations after Pfizer-BioNTech COVID-19 vaccine include erythematous plaques at the injection site, diffuse morbilliform rash, mild erythema at various body sites and positive dermographism.[4] Recently, Soyfer *et al.*[5] described two patients with RRD following two doses of the Pfizer-BioNTech vaccine. The exact mechanism of RRD is unknown and a possible explanation is a local hypersensitivity reaction triggered by the vaccine via upregulation of inflammatory cytokines that were already increased in the area of irradiation.[1,2] To our knowledge, this is the first case of RRD triggered by the CoronaVac vaccine. As SARS-CoV-2 vaccines are continuing to be administrated on a large scale, clinicians should be aware of the potential risk of RRD in patients with a previous history of radiotherapy.

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Acknowledgement

The patient provided written informed consent to publication of the case details and photographs.

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Conflict of interest: the authors declare that they have no conflicts of interest.

Accepted for publication 2 June 2021

References

1 Camidge R, Price A. Characterizing the phenomenon of radiation recall dermatitis. *Radiother Oncol* 2001; **59**: 237–45.

2 Ristić B. Radiation recall dermatitis. *Int J Dermatol* 2004; **43**: 627–31.

3 Sasaki K, Iinuma S, Fujii M *et al*. Radiation recall dermatitis induced by mogamulizumab. *J Eur Acad Dermatol Venereol* 2020; **34**: e107–8.

4 Corbeddu M, Diociaiuti A, Vinci MR *et al*. Transient cutaneous manifestations after administration of Pfizer-BioNTech COVID-19 vaccine: an Italian single centre case series. *J Eur Acad Dermatol Venereol* 2021. Epub ahead of print. https://doi.org/10.1111/jdv.17268

5 Soyfer V, Gutfeld O, Shamai S *et al*. COVID-19 vaccine-induced radiation recall phenomenon. *Int J Radiat Oncol Biol Phys* 2021; **110**: 957–61. https://doi.org/10.1016/j.ijrobp.2021.02.048

Melanoma and eruptive naevi during cetuximab treatment: epidermal growth factor inhibitors and a common concern

doi: 10.1111/ced.14787

Dear Editor,

A 59-year-old male patient presented to the Melanoma Unit for a dermatological consultation because of the eruptive onset of multiple hyperpigmented naevi 1 month after beginning medical therapy with cetuximab for metastatic colorectal cancer. No other adverse effects (AEs) were reported, with the exception of a mild cutaneous xerosis.

The face, scalp, palms and soles were the main localization of hyperpigmented acquired naevi 3–4 mm in size (Figs 1 and 2). Dermoscopy revealed a predominant reticular pattern. On the left pectoral region, a 5-mm lesion had a central black to grey blotch associated with fine peripheral streaks (Fig. 2d). This lesion was excised and diagnosed as a superficial spreading melanoma (Breslow thickness 0.4 mm, pT1a).

The patient had been evaluated 1 year earlier because of development of symmetrical drug-related intertriginous and flexural exanthema during their treatment with folinic acid, fluorouracil and irinotecan. A comparison of the new clinical and dermoscopic images with those previously recorded showed that even the other pre-existing naevi had an increase in pigmentation.

Cetuximab is an epidermal growth factor receptor (EGFR) inhibitor, which is currently approved for the treatment of metastatic or unresectable colorectal cancer and advanced squamous cell carcinoma. Cutaneous AEs reported in clinical trials encompass papulopustular eruptions[1,2] and less frequently, itching, xerodermia, hair changes, conjunctivitis, telangiectasias, paronychia, and fissuring of the palms and soles.[1,2]

EGFR inhibitors belong to two main groups: monoclonal antibodies (cetuximab and panitumumab) target the extracellular portion of the receptor with consequent inhibition of the signalling pathways, while tyrosine kinase inhibitors (erlotinib, gefitinib and lapatinib) act through intracellular binding to this portion of the EGFR.

Both categories of EGFR inhibitors have been associated with similar skin AEs, except for the onset of darkening and eruptive naevi on the trunk and extremities associated with erlotinib, which were described in three previous reports.[2–4] A paradoxical upregulation of the mitogen-activated protein kinase (*MAPK*) pathway together with a reactive enhanced expression of *c-KIT* have been hypothesized, with subsequent induction of melanocytic proliferation.[3]

To our knowledge, this is the first case of melanoma development associated with darkening and eruptive naevi in a patient undergoing cetuximab therapy. It is also reasonable to suggest a paradoxical activation of the MAPK pathway related to the EGFR blockage in our patient.

Clinicians should be aware of this possible occurrence in patients undergoing treatment with all categories of EGFR inhibitors. Regular sequential dermoscopic monitoring should be performed for these patients, as suggested for other targeted therapies,[5] in order to detect changes in melanocytic lesions at an early stage and prevent the onset of melanoma.

Acknowledgement

The patient provided written informed consent to publication of the case details and photographs.

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Conflict of interest: the authors declare that they have no conflicts of interest.

Accepted for publication 2 June 2021

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