Pityriasis Rubra Pilaris following SARS-CoV-2 vaccination

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Introduction

Cutaneous side effects documented in the phase III clinic trial following the Pfizer-BioNtech vaccine included only injection site erythema. However, subsequent to the initial authorization and the progression of the vaccination rollout, further dermatological adverse effects have been reported. The most common cutaneous side effects being delayed local site reaction, urticaria, morbilliform rash and erythromelalgia. Some cutaneous side effects have been also attributed to a delayed hypersensitivity reaction. Reactions that mimicked skin eruptions secondary to infection have also been described: such as pernio or erythromelalgia, where the host response to the virus is being imitated by the vaccine.[1,2] Pityriasis rubra pilaris (PRP) is a rare skin disorder, aetiology unknown, it has previously been associated with medications, infections such as HIV and there are four case reports in the literature of PRP triggered by vaccines, specifically influenza, diphtheria-tetanus-polio and measles-mumps-rubella vaccines. More recently, three cases have been published of PRP triggered by COVID-19 vaccines, Astra-Zeneca in two occasions, and one case after receiving the Pfizer vaccine. [3-5]

Clinical findings

We present the case of an 89-year-old male who was reviewed by the dermatology team with an erythematous, well demarcated, scaly rash following vaccination with the Pfizer-BioNtech mRNA vaccine. His background consists of a previous malignant melanoma, hypothyroidism, coronary artery disease, and chronic kidney disease. He was on long-standing medication including levothyroxine, bisoprolol, atorvastatin, aspirin, candesartan and indapamide. He was otherwise well.

He developed a mild rash approximately two weeks after the first dose of the vaccine starting in a cranio-caudal distribution involving his head, neck, trunk and upper limbs. This was followed by a severe flare of his cutaneous symptoms after the second dose with pruritus and progression to erythroderma resulting in inpatient admission. He also reported severe epiphora and blurred vision. He was systemically stable with no pyrexia.

On physical examination he had coalescing areas of scaly erythema with characteristics islands of sparing, marked palmoplantar keratoderma leading to painful fissures with difficulty mobilising. He had nail dystrophy. Bilateral ectropion was evident with associated blurred vision and dryness.

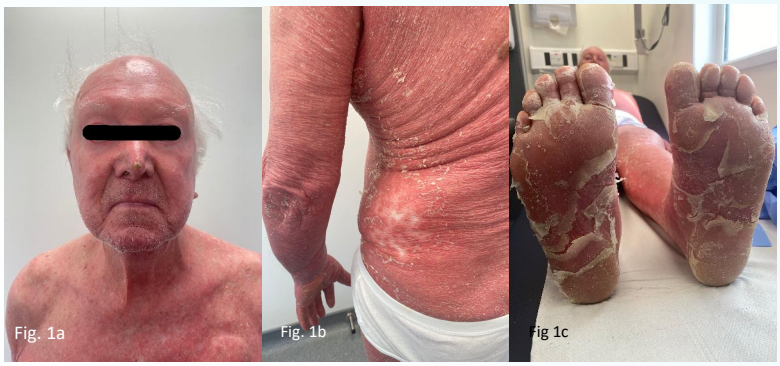

Figure 1a. Confluent scaly erythema.
Figure 1b. Island of sparing
Figure 1c. Plantar keratoderma

Investigations

Laboratory investigations were within normal limits and connective tissue disease and HIV serology were negative. Skin biopsies from the back were taken for histopathological and immunofluorescent analysis. The histology showed irregular acanthosis, broad rete ridges, a thick supra-papillary plate, and a superficial perivascular infiltrate. (Figure 2a) Alternating parakeratosis and orthokeratosis can be seen in higher power. (Figure 2b) Acantholysis was also present, which can be seen histologically before erythema ensues. Direct immunofluorescence showed no antibody mediated process.

After clinicopathological correlation the diagnosis was consistent with PRP secondary to the COVID-19 vaccine.

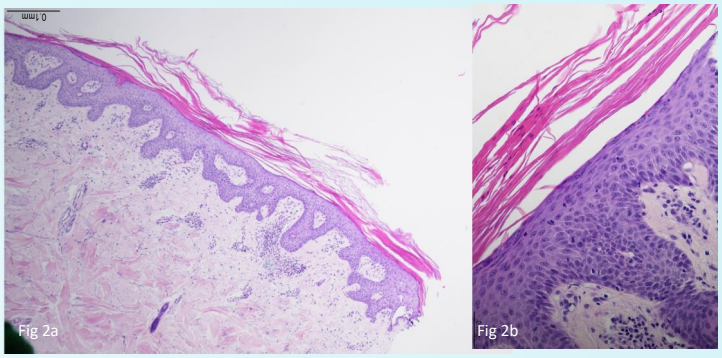

Figure 2a. Hematoxylin and eosin (H+E) stain x 20 magnification.
Figure 2b. H+E x 200 magnification.

Treatment

Prior to his inpatient admission, his general practitioner commenced a course of prednisolone with no improvement.. Acitretin was commenced at 25 mg once daily for 2 months and increased to 35 mg once daily which he tolerated poorly. He combined this with topical clobetasol ointment, emollients, and 25% urea ointment for the plantar aspects of both feet. Unfortunately our patient failed to respond and treatment was escalated to ustekinumab.

Discussion

PRP secondary to COVID-19 vaccination has been documented only thrice in the literature. While a rarity, vaccinations against SARS-CoV-2 are being given to the majority of the population with an increasing likelihood of booster administration. It is likely that such reactions will become more frequent. During initial trials it appeared that skin adverse effects were infrequent so further surveillance and studies will be necessary to elucidate the full extent of the dermatological side effects. We have highlighted a case of PRP, a rare but recognised cutaneous side effect from the COVID-19 vaccine.

Although the efficacy and safety profiles of mixing vaccine types has not yet been established. Sudies such as the Oxford Vaccine Group's Com-CoV vaccine trial indicated that changing the type of vaccine given may be of benefit, as the second dose may help mitigate the severity or recurrence of adverse effects such as cutaneous eruptions.

References

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