Acute episode of erythrodermic psoriasis following self-administration of expired insulin glargine

Adriana Bevilacqua,1 Andre Obua,2 Ilya Fonarov,1 Damian Casadesus1

DESCRIPTION

A man in his 60s with medical history of ketosis-prone type 2 diabetes, deep venous thrombosis, hypertension, hypercholesterolaemia and hypothyroidism presented to the emergency room with a generalised rash of 3 weeks duration. The rash started 5 days after he self-administered a dose of insulin glargine that was 3 months beyond the expiration date. The rash started as pruriginous hives in the chest and spread to the extremities and head as a maculopapular rash with flaking. He denied any previous history of skin disease or malignancy. The patient’s home medications included apixaban, insulin glargine, chlorthalidone, ergocalciferol, fenofibrate, levothyroxine and valsartan. He had no allergies to medications, and he denied smoking, drinking alcohol or the use of recreational drugs.

On arrival to the emergency room, his vital signs were as follows: temperature 37°C, heart rate 108 beats per minute, respiratory rate 15 breaths per minute and blood pressure 135/68 mm Hg. Cardio-pulmonary and abdominal examinations were normal. Skin examination revealed diffuse scaly desquamating pink plaques covering the whole body and head including scalp but sparing the face (figures 1 and 2). Left-sided supraclavicular and bilateral inguinal lymphadenopathy were palpable. There was no nail pitting, hair loss, joint pain or swelling. Oral mucosa was unremarkable. Laboratory investigations were significant for a glucose of 383 mg/dL, C reactive protein of 2.5 mg/dL and white cell count 177×10⁹/L with 1.6% eosinophils. Antinuclear antibody showed a fine granular and speckled pattern with a titer of 1:160. HIV, syphilis serology, and Human T-lymphotropic virus (HTLV)-1 and HTLV-2 were negative. CT scan with intravenous contrast of the chest, abdomen and pelvis revealed no evidence of malignancy but mildly prominent bilateral inguinal lymph nodes, presumed to be reactive. Multiple skin biopsies revealed superficial perivascular lymphocytic infiltrate, dilated and tortuous capillaries in multiple dermal papillae, psoriasiform epidermal hyperplasia, thin suprapapillary plates and broad mounds of parakeratosis (figure 3). Immunohistochemistry showed lymphocytes to be predominantly CD3 positive T cells with CD4>CD8, retention of CD7, and CD20 showed a normal distribution of B cells, consistent with psoriasis. No evidence of cutaneous lymphoma was identified. Thus, based on the pathology and the clinical presentation the patient was diagnosed with erythrodermic psoriasis (EP).

Treatment began with intravenous methylprednisolone 20 mg every 8 hours which led to worsening hyperglycaemia and subsequent diabetes ketoacidosis (DKA). The patient required treatment with an intravenous insulin drip in the intensive care unit. The patient was then switched to topical triamcinolone acetonide 1% ointment two times per day and oral cyclosporine 150 mg two times per day with improvement of the rash over 10 days. The patient was discharged home on his usual insulin glargine dose and all the other home medications. One week after discharge, the patient was readmitted for intravenous antibiotic treatment of otitis externa. At that time, he did not manifest a new or worsening rash. A perusal review of the literature did not show an association between EP and any of the patient’s home medications. The Naranjo probability scale was used to evaluate the
adverse drug reaction. In our patient, the score was at least 7 or higher because some of the evaluations were not able to be performed. Our patient had self-administered a single dose of expired insulin glargine, and we did not repeat the administration, use a placebo, or detect the concentration in blood because he was already on insulin in the hospital. Therefore, we further postulated that expired insulin glargine was responsible for the induction of EP.

EP is rare and severe, only accounting for 1%–2.24% of psoriatic patients. The common presentation is typically erythema, oedema, pruritus, ill-defined psoriatic plaques, scaling, hair loss, and rarely exudative lesions and palmoplantar or diffuse desquamation. There have been several potential causes of EP. These range from environmental due to trauma, sunburn, alcoholism or infection; chemical reactions from CT contrast, topical tar; systemic illness with HIV, leukaemia, lymphoma and gout. Medications such as lithium, bupropion, antimalarials, infliximab; discontinuing steroids, methotrexate and efalizumab have been associated with EP. There is no previous description of EP associated with expired insulin glargine administration. The use of systemic glucocorticoids for EP is discouraged due to their ability to trigger severe psoriasis flares; however, this did not occur in our patient. Our patient was successfully treated with topical steroids and cyclosporine.

The exact pathogenesis of EP is not well understood. The disease is associated with predominantly T helper (Th) 2 expression from studies demonstrating increased levels of IgE in patients with EP. There is a switch from Th1 to Th2 dominant. Type 1 IgE mediated has been the most reported type of hypersensitivity reaction to insulin but type 3 and type 4 can also occur. The presentation for insulin hypersensitivity typically ranges from a local erythema and swelling at the injection site to generalised reactions like urticaria and angioedema which does not match this patient’s presenting symptoms. We believe this is the first report documenting a relationship between expired insulin and EP. The patient was advised about the correct use of medications before he was discharged.

**Learning points**

- Erythrodermic psoriasis (EP) should be suspected in a patient with a generalised cutaneous finding of erythema, oedema and pruritus after administration of expired insulin.
- EP treatment with topical triamcinolone acetonide and oral cyclosporine is considered a better treatment option in diabetics to prevent further hyperglycaemia produced by systemic steroids.
- Patient education regarding complications of insulin use should be addressed at all appointments.

**Contributors** AB, AO, IF and DC were responsible for drafting of the text, sourcing and editing of clinical images, investigation results, drawing original diagrams and algorithms, and critical revision for important intellectual content. All authors participated in the clinical management of the patient, and obtained and edited the figure. All authors have been involved in the drafting and discussion of the manuscript, gave final approval of the manuscript, and reviewed and approved the final version.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Consent obtained directly from patient(s).

**Provenance and peer review** Not commissioned; externally peer reviewed.

Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

**ORCID ID**

Damian Casadesus http://orcid.org/0000-0001-5273-2228

**REFERENCES**