Here, we present a case of vitiligo associated with lipohypertrophy in a patient with type 1 diabetes mellitus on Lantus and Novorapid subcutaneous insulin. The patient, a 55-year-old woman, was diagnosed with type 1 diabetes 53 years ago. Following 11 years using Novorapid and Lantus she developed lipohypertrophy at her injection sites with associated depigmentation of the skin. The depigmentation has recurred following changing injection sites.

We believe this is the first case of its kind to be reported in the literature and teaches a valuable lesson about the importance of examining injection sites.

**Key words**
- diabetes
- insulin
- depigmentation
- vitiligo
- lipohypertrophy

**Introduction**

Here, we present a case of vitiligo associated with lipohypertrophy in a patient with type 1 diabetes mellitus on Lantus and Novorapid subcutaneous insulin.

**Case**

This 55-year-old woman with a 53-year history of type 1 diabetes mellitus (T1DM) had been treated with various types of insulin throughout the years (see Table 1). Her diabetes was often difficult to manage, with frequent hypoglycaemia due to tight regulation of blood sugars. Therefore, she has tried multiple different preparations, changing usually due to hypoglycaemia but also as new preparations became available. She suffered some lipoatrophy as an adolescent, a recognised immune-mediated complication of the bovine insulin she was using at the time which has become less common following the introduction of purified human insulin.1,2

In November 2014 upon review in clinic this patient had developed lipohypertrophy with associated depigmentation around both of her injection sites (Figure 1, arrows A and B).

The patient had no past medical history of vitiligo and no depigmentation elsewhere. She had recently changed her injection sites and had developed further depigmentation around the new area (Figure 1, small arrow C).

**Discussion**

Vitiligo is a depigmenting skin condition which is more common among people with T1DM and is thought to be of autoimmune pathology. However, research suggests that patients more commonly develop hyperpigmented lesions resembling acanthosis nigricans.3–4 Allergy to insulin or its preservatives usually presents as erythema, pruritus and induration at the site of injection as a type 1, IgE mediated, hypersensitivity reaction.5

Review of the literature suggests only one previously documented case of vitiligo associated with insulin use, occurring at the sites of insulin lispro infusion in a 32-year-old female. In this case there was a 19-year history of T1DM with three years of insulin pump therapy. Unlike our patient, this woman had a pre-existing diagnosis of vitiligo and the new areas persisted despite rotation of the infusion sites and changing infusion catheters.5

In this case, the authors questioned whether the vitiligo represented an allergic reaction. Furthermore, depigmentation has been observed following subcutaneous pegylated interferon alpha 2a treatment for chronic hepatitis in two cases and after a steroid joint injection in another.4,6 All of these documented cases may be related to the Koebner phenomenon.

The Koebner phenomenon is a widely recognised and deeply
researched dermatological reaction first noticed in patients with psoriasis who developed new lesions at sites of skin trauma. It is defined as ‘the development of lesions at sites of specifically traumatised uninjured skin of patients with cutaneous diseases’.7,8

Secondary lesions can appear in response to mechanical trauma or repeated friction and are identical to spontaneously arising lesions elsewhere. The extent of vitiligo seen varies depending on the type and depth of associated skin trauma.9

The majority of available research describes the Koebner phenomenon occurring in patients previously diagnosed with vitiligo, unlike our patient. Although it is recognised that this response can occur in individuals without a pre-existing skin condition, there is little research to suggest why.

Interestingly, studies in mice have linked intradermal (ID) injections with vitiligo development in mice previously free of dermatological conditions. When compared to intramuscular injection of the same medication there was a higher cellular and humeral response in the ID mice suggesting the skin trauma, rather than the contents of the vaccine, was more likely to have caused vitiligo.10

Table 1. The patient’s insulin treatment regimens

When she returned to clinic six months later there were no new areas of lipohypertrophy or vitiligo following rotation of injection sites. Furthermore, her glycaemic control had significantly improved with less fluctuation in her glucose levels. It is not clear whether the lack of depigmentation at the new injection sites is due to removal of allergen by changing the Novorapid to Humalog or to decreased trauma by rotating her sites.

This patient, with a 53-year history of problematic T1DM, has seen a significant improvement following adherence to straightforward instructions, and we should ensure that all patients receive this advice and support from the beginning of treatment to avoid these significant side effects. Erratic control should prompt an inspection of injection sites, and allergy to insulin preparations should be considered.

For patients with such a long history of diabetes we may assume that they are aware of the importance of injection site rotation and potential side effects of treatment; however, we must remember to revisit these topics frequently as well as examining injection sites to ensure that these treatable problems are not missed. Simple advice about rotation of injection sites is extremely important.

### Declaration of interests

There are no conflicts of interest declared.

### References

References are available in Practical Diabetes online at www.practicaldiabetes.com.
Case report

Vitiligo and lipohypertrophy surrounding insulin injection sites

References


