52 Skin Problems Associated with Diabetes

David Buckley

Key Points

- Systemic diseases such as diabetes can have associated skin manifestations which may precede the underlying disease and may be a clue to their diagnosis. Some systemic diseases are treated with drugs which may also cause skin problems.
- All patients presenting with skin infections should have their blood sugar or HbA1c checked, looking for undiagnosed diabetes or checking how well controlled their existing diabetes is.
- Necrobiosis lipoidica is strongly linked with diabetes and can predate the diagnosis of diabetes by many years. 1% to 2% of patients with diabetes will develop necrobiosis lipoidica.
- Treatment of some skin conditions may precipitate or aggravate underlying systemic diseases (e.g. high dose steroids may aggravate diabetes or methotrexate may cause liver disease).

What to Tell the Patient

- Diseases such as seborrhoeic dermatitis and viral warts can be more difficult to treat in the presence of poorly controlled diabetes.
- Diabetes mellitus (DM) Type 1 and 2 is very common and the incidence is increasing worldwide. It is commonly associated with skin problems, some of which can predate the development of diabetes or be a clue to its existence for undiagnosed cases.
- Poorly controlled diabetes and patients on multiple medications because of their diabetes are more likely to develop skin problems.

52.1 Introduction

Skin conditions associated with diabetes mellitus (DM) can be mainly classified into five main categories [1]:

1. Infections (bacterial, fungal, viral) associated with hyperglycaemia.
2. Cutaneous manifestations of diabetic complications (microangiopathy, macroangiopathy, neuropathy).
3. Skin reactions due to diabetic treatment (sulphonylureas or insulin).
4. Skin lesions with an association with diabetes (necrobiosis lipoidica, diabetic dermopathy, diabetic bullae, diabetic stiff skin, eruptive xanthomas, acanthosis nigricans, granuloma annulare).
5. Skin diseases that are more common in patients with diabetes such as xerosis (dry skin), psoriasis and eczema.

D. Buckley (✉)
The Ashe Street Clinic, Tralee, Co. Kerry, Ireland

D. Buckley, P. Pasquali (eds.), *Textbook of Primary Care Dermatology*,
https://doi.org/10.1007/978-3-030-29101-3_52

52.2 Infections

At least 30–50% of patients with diabetes have skin problems. The most common are bacterial skin infections such as boils, carbuncles, folliculitis and cellulitis. Yeast and fungal infections such as tinea paedis, tinea unguium, candidiasis, intertrigo and seborrhoeic dermatitis are all more common in those with diabetes. Viral infections such as viral warts, herpes simples and varicella-zoster also occur more often in patients with diabetes. These infectious diseases are more common if the diabetes is poorly controlled. All patients presenting with skin infections should have their blood sugar or HbA1c checked, looking for undiagnosed diabetes or checking if their known diabetes is being well controlled.

52.3 Cutaneous Manifestations of Diabetic Complications

Diabetes can often lead to peripheral vascular disease, especially if the patient has hyperlipidaemia or is a smoker. This can predispose to diabetic leg and/or foot ulcers which are mostly arterial. Diabetes can also be associated with neuropathy which can be another risk factor for foot ulcers.

52.4 Skin Reactions to Diabetic Treatment

The drugs that are used to treat diabetes can sometimes cause drug rashes and this should always be considered if someone with diabetes presents with a rash or itch of unknown origin. Injection site reactions from insulin can also lead to local skin reactions.

52.5 Skin Lesions with an Association with Diabetes

52.5.1 Necrobiosis Lipoidica

Necrobiosis lipoidica is a rare granulomatous skin disorder that most commonly occurs on the shin, often bilaterally, although it can occur in other areas of the body. Necrobiosis lipoidica is also known as necrobiosis lipidida diabeticorum as it is strongly linked with diabetes and can predate the diagnosis of diabetes by many years. More than half of the patients with necrobioses lipoidica will have or will eventually develop diabetes. 1% to 2% of patients with diabetes will develop necrobiosis lipoidica [2]. It is more common in women and in smokers.

It usually starts as an asymptomatic, erythematous, macular patch which grows slowly over months or years. As it matures, the plaques become more atrophic with a yellow-orange appearance and associated telangiectasia (Figs. 52.1 and 52.2). Sometimes it can ulcerate and become painful. As the plaques mature they become shiny, pale, thin and hairless. A minor injury may cause small ulcers which may become infected.

Although necrobiosis lipoidica has a classical clinical appearance, a skin biopsy is usually required to confirm the diagnosis and to exclude more serious conditions such as squamous cell carcinoma or a superficial spreading BCC.

Treatment is symptomatic and will depend on the stage of the disease. Milder cases may respond to potent topical steroids, sometimes with occlusion or intralesional steroid injections.

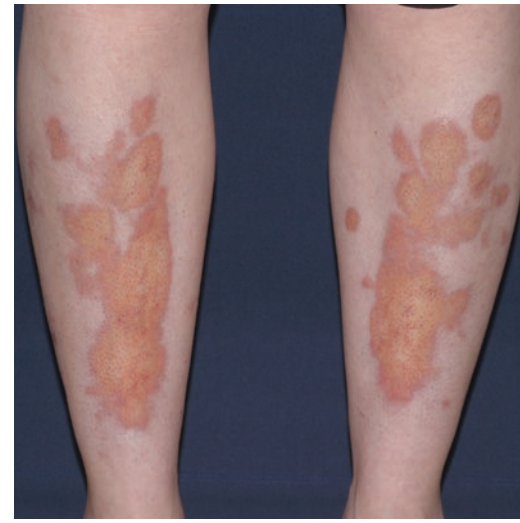

Fig. 52.1 Necrobiosis lipoidica that was present for 5 years without being diagnosed with diabetes

Fig. 52.2 Necrobiosis lopoidica present for the last 13 years and no diabetes diagnosed

Topical tacrolimus may help in milder cases. Systemic treatment such as cyclosporin or biologic agents may be required in severe cases [3].

52.5.2 Granuloma Annulare

This is a benign condition that usually presents as an annular rash that often affects the hands or feet in children and young adults. Most cases of granuloma annulare occur spontaneously but this condition can occasionally be linked with diabetes or thyroid disease. Extensive cases can sometimes be linked with lymphoma, HIV infection and solid tumours [4].

The dermal annular plaques which have a thickened, nodular, papular border, most commonly occur over joints, particularly the knuckles. The centre of each ring is often flat and relatively normal. The plaques may be solitary or multiple (see Chap. 5, Fig. 5.1). The annular rash can be confused with tinea corporis (ringworm) or a BCC, but unlike these conditions, granuloma annulare is a deep dermal lesion with no scaling, bleeding or ulceration and the skin surface is smooth.

Occasionally, granuloma annulare can become more generalised in adults, particularly spreading to the skin folds around the axillae and groin.

The main problem with granuloma annulare is cosmetic as it can cause an unsightly rash. Some cases can be associated with itch. Diagnosis can be confirmed by a biopsy which show necrobiotic degeneration of dermal collagen but despite the name there is no granulomas on histology. Milder cases with little or no symptoms do not necessarily require treatment as the plaques often clear spontaneously after a few months or years. More troublesome cases may respond to potent topical steroids or intralesional steroid injections. Some cases can respond to cryosurgery, topical imiquimod or topical calcineurin inhibitors (tacrolimus). Widespread cases may require systemic doxycycline [5], steroids or other immunosuppressants.

52.5.3 Acanthosis Nigricans

This is a rare condition where the patient presents with thickened, brown, velvet-like hyperkeratotic plaques, usually affecting the back of the neck, axillae and groin, as a result of increased insulin growth factor or tumour growth factors (Fig. 52.3). It can be associated with obesity, diabetes, the metabolic syndrome, autoimmune disease, drugs and even paraneoplastic syndrome. Extensive cases, particularly if there is a sudden onset and associated thickening of the palms and face, can be linked with an underlying malignancy such as carcinoma of the gastrointestinal tract. Treatment is by dealing with the underlying cause. Topical retinoids, lasers or other surgical methods may help improve the appearance.

52.5.4 Diabetic Dermopathy ("Shin Spots")

This usually presents as small reddish-brown, oval or round pigmented patches on the shins or sometimes other areas of the body (front of the thighs, forearm, side of the foot, scalp and trunk). They are most commonly found in patients with DM. They may be traumatic in origin or associ-

Fig. 52.3 Acanthosis nigricans in the axilla in an obese female with a history of gestational diabetes

ated with neuropathy or vasculopathy. It is more common in the elderly and in those with poor diabetes control. No treatment is usually required as they are usually asymptomatic. Cosmetic camouflage may help hide the appearance of the pigmentation.

52.5.5 Diabetic Bullae

This condition causes large spontaneous bullae on any part of the body in patients with DM but most commonly occur on the feet and hands. It is also known as bullosis diabeticorum and is of unknown aetiology. The blisters may be intraepidermal (heal with no scaring) or subepidermal (heal with scars or atrophy) and may be fluid or blood filled. Most cases heal spontaneously.

52.5.6 Diabetic Stiff Skin

This most often occurs in patients with long-standing type 1 DM. The skin can become waxy, thickened and yellow and may causes stiffness of the skin especially over the fingers and hands.

52.5.7 Eruptive Xanthomas

This is very rare condition where the patient develops crops of tender or itchy, red-yellow papules which most commonly arise over the buttocks, shoulders, arms or legs. It can be associated with diabetes and most cases resolve spontaneously over a few weeks or months.

52.6 Skin diseases that are more common in patients with diabetes

Some common skin conditions such as xerosis (dry skin), psoriasis and eczema are more commonly found in patients with diabetes.

52.7 Conclusion

Diabetes is the most common endocrine disorder found in primary care, affecting 8.3% of the population [6]. Skin disorders are found in 79.2% of people with diabetes and mostly in type 2 diabetes. The most common skin manifestations are cutaneous infections (47.5%), xerosis (26.4%), and inflammatory skin diseases (20.7%) [7]. Cutaneous disease can appear as the first sign of diabetes or may develop at any time in the course of the disease.

References

1. De Macedo GMC, Nunes S, Barreto T. Skin disorders in diabetes mellitus: an epidemiology and physiopathology review. Diabetol Metab Syndr. 2016;8(1):63. https://doi.org/10.1186/s13098-016-0176-y.
2. Grillo E, Rodriguez-Munoz D, Gonzalez-Garcia A, et al. Necrobiosis lipoidica. Aust Fam Physician. 2014 Mar;43(3):129–30.
3. Erfurt-Berge C, Seitz AT, Rehse C, et al. Update on clinical and laboratory features in necrobiosis lipoidica: a retrospective multicentre study of 52 patients. Eur J Dermatol. 2012 Nov-Dec;22(6):770–5. https://doi.org/10.1684/ejd.2012.1839.
4. Thornsberry LA, English JC 3rd. Etiology, diagnosis, and therapeutic management of granuloma annulare: an update. Am J Clin Dermatol. 2013 Aug;14(4):279–90. https://doi.org/10.1007/s40257-013-0029-5.
5. Duarte AF, Mota A, Pereira MA, Baudrier T, Azevedo F. Generalized granuloma annulare--response to doxycycline. J Eur Acad Dermatol Venereol. 2009 Jan;23(1):84–5.
6. Centers for Disease Control and Prevention 2011 National diabetes fact sheet. Available from http://www.cdc.gov/DIABETES//pubs/factsheet11.htm. Accessed 25 August 2013.
7. Demirseren DD, Emre S, Akoglu G, et al. Relationship between skin diseases and extracutaneous complications of diabetes mellitus: clinical analysis of 750 patients. Am J Clin Dermatol. 2014;15:65–70.