Granular parakeratosis associated with benzalkonium chloride exposure

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CASE

A man, aged 55 years, presented to his general practitioner with a rapid-onset, painful rash that had developed over 24 hours. The patient reported using ibuprofen gel after the rash commenced, with no other medication changes. It transpired that the patient's washing machine had recently broken and so he was soaking his clothes in a highly concentrated solution with ultra-multipurpose spray containing benzalkonium chloride (BAC).

On examination, the patient had a well-demarcated erythema across his posterior neck (Figure 1). There was a symmetrical, macerated erythema with yellow discharge inferiorly on the upper inner thighs, and both lateral thighs were erythematous with erosions (Figure 2). There was full-thickness epidermal inflammation, sloughing and necrosis at the groin and buttock (Figure 3). There was no oral mucosal involvement and no lymphadenopathy. The patient was admitted to hospital for further management.

QUESTION 1

Prior to biopsy, what are the differential diagnoses?

ANSWER 1

The primary differential following initial dermatology review is toxic epidermal necrolysis (TEN) given the full-thickness epidermal slough and necrosis and the extent of the reaction. Other considerations include severe irritant contact dermatitis and Hailey–Hailey disease. Although there is uncertainty around the definite diagnosis, the trigger is thought to be the multipurpose spray containing BAC.

CASE CONTINUED

The predominant feature of the histopathology biopsies was the presence of broad zones of confluent superficial epidermal necrosis. There were no specific reactions for immunoglobulin (Ig)G, IgA, IgM or C3 on immunofluorescence. The histopathology report did not favour any of the differentials in particular; at this point, the clinical features were felt to be more in keeping with TEN.

QUESTION 2

What is an appropriate treatment plan for this patient?

ANSWER 2

Initial medical management includes intravenous antibiotics, a two-day course of oral prednisolone 50 mg, betamethasone ointment and emollient ointment. A key aspect to management also includes the avoidance of further contact with BAC. The patient is encouraged to completely stop wearing any contaminated clothes because BAC is known to persist in clothing for many washes.

Figure 1. Well-demarcated erythema across the patient's posterior neck.

Figure 2. Symmetrical, macerated erythema with yellow discharge inferiorly on the upper inner thighs, and bilaterally erythematous lateral thighs with erosions.

CASE CONTINUED

The patient improved clinically and was discharged home after three days. When the patient was seen in clinic a week later, he had new erythematous plaques in the flexures of both his arms, the forearms and the inner and lateral thighs. This reinforced the idea that there was an element of ongoing irritant reaction. The patient was rebiopsied, and the report came back as mild spongiotic dermatitis. One of the specimens showed granular parakeratosis, which is considered a variant of irritant contact dermatitis.

It transpired at the patient's follow-up clinic appointment two weeks later that he had run out of his topical steroids prior to the recent new erythematous plaque breakout. Instead of using steroids, he had been applying QV Flare Up Wash at home to all his problem areas (neck, axillae, groin, buttocks). He had also been using QV Flare Up Bath Oil. Both products were found to contain BAC.

QUESTION 3

What is granular parakeratosis?

QUESTION 4

What is the association between granular parakeratosis and BAC exposure?

QUESTION 5

What are the treatment options for granular parakeratosis?

Figure 3. Full thickness epidermal inflammation, sloughing and necrosis at the groin and buttock.

ANSWER 3

Granular parakeratosis is a benign dermatosis characterised by scaly erythematous or brown hyperkeratotic papules, typically developing at intertriginous areas. It is a rare and frequently overlooked condition when it comes to the diagnosis of flexural dermatoses. It is best described as an irritant contact reaction; however, the exact aetiology is unclear.[1] It is often diagnosed clinically, however, histological confirmation might also be sought. The most common finding being retained keratohyalin granules within the stratum corneum.[2] Differentials to consider should include intertrigo, irritant contact dermatitis, zinc deficiency and necrotic migratory erythema.[3]

ANSWER 4

Granular parakeratosis has been linked to the use of chemical irritants found in household products, including BAC.[2] BAC is a quaternary ammonium compound that has antiseptic and preservative actions. As well as household cleaning products, typical products containing BAC might include personal care products such as shampoo and moisturisers; wet wipes; antiseptics; and eye drops or ophthalmic preparations, such as contact lens solutions. BAC is thought to disrupt cellular lipid membranes and inactivate certain enzymes within the skin.[3] In certain individuals, this can lead to the proliferation and abnormal development of keratinocytes.[3] BAC is the most widely reported contact irritant to be linked to the development of granular parakeratosis.[4–9]

ANSWER 5

There are a number of recognised treatment options for granular parakeratosis, but treatment response can often be inconsistent. Critical initial management involves recognising and avoiding specific contact triggers; in this case, avoiding further contact with BAC. In addition, topical steroids, tretinoin and vitamin D derivatives have been reported as being effective treatment options.[10]

CASE CONTINUED

When seen two weeks later, the patient still had patches of erythema on his skin but, in general, was much improved.

Key points

- It is imperative to keep granular parakeratosis as a differential diagnosis when it comes to skin presentations involving blistering and/or extensive rashes.
- When granular parakeratosis is a differential diagnosis, specific questions regarding irritants must be asked during history-taking.
- Histopathological analysis can aid the diagnosis of granular parakeratosis.

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