Two Episodes of Axillary Granular Parakeratosis Triggered by Different Causes: Case Report

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SUMMARY Granular parakeratosis is an acquired disorder of keratinization characterized by keratotic papules and plaques located in the intertriginous areas. Its etiology is unknown. Some cases have been related to the application of deodorants and antiperspirants, local irritation or increased sweating; in other cases no precipitant factors have been found. We report a case of axillary granular parakeratosis in an adult male in whom the lesions appeared twice under different circumstances: the first time the lesions appeared after local irritation produced by an antiperspirant and/or the use of a paste containing zinc oxide; two years later, an identical eruption reappeared in both axillae, while using his habitual deodorant and without a preceding irritation of the zone; only excessive sweating was mentioned this time after a weight gain of 20 kg. On both occasions, the lesions disappeared completely a few days after using topical calcipotriol. A constitutional factor may predispose the development of granular parakeratosis, which must be considered a reaction pattern that can be induced by multiple different causes.

KEY WORDS: axilla, calcipotriol, keratinizing disorders, parakeratosis

INTRODUCTION

Granular parakeratosis is a benign, acquired disorder of keratinization, clinically characterized by erythematous to brown keratotic papules and plaques, with a cobblestone ‘stuck-on’ appearance, located in the intertriginous areas. It was first described to affect the axillae (1). Further reports mentioned its occurrence in other areas such as groins, intermammary or submammary regions, abdominal folds, perianal area (2), intergluteal (3) or napkin area (4), and even on the face (5).

The etiology of the process is unknown. In some cases, it has been related to the application of topical preparations such as deodorants and antiperspirants, and in others to local irritation or increased sweating. However, in some patients no precipitant factors have been detected.

We report a case of granular parakeratosis, which originated and recurred under different circumstances.

CASE REPORT

A 27-year-old man presented with a symmetric eruption of two-week duration affecting both axillae. He reported that he had changed his usual deodorant for another one (which contained aluminum chloride hexahydrate) that provoked mild irritation in both axillae, which he treated with a paste containing zinc oxide. Erythematous and papillomatous scaly
plaques developed after two days on the affected areas, accompanied by mild pruritus (Figs. 1 and 2). Biopsy of one of his lesions showed an epidermis with moderate to marked irregular acanthosis, hypogranulosis and hypergranulosis with ortho- and parakeratin, and keratohyalin granules. The papillary dermis showed dilated vessels, edema and a scarce to moderate lymphohistiocytic perivascular infiltrate (Figs. 3 and 4).

He was treated with topical calcipotriol 0.005%, improving completely after a few days.

Two years later, a similar eruption reappeared on both axillae. On this occasion, he had not changed his deodorant, no previous irritation existed and no other topical products were used. However, he mentioned that during the last year he had gained 20 kg of weight and that he had begun to sweat profusely in his axillae. Blood glucose and thyroid hormone levels were within the normal limits.

He was treated once again with topical calcipotriol and the lesions disappeared completely in three days, leaving mild hyperpigmentation.

**DISCUSSION**

The pathogenesis of granular parakeratosis has not been completely resolved. It has been proposed that it consists of an acquired alteration in the conversion process from profilaggrin to filaggrin, which maintains the keratohyalin granules in the stratum corneum (1). Currently, granular parakeratosis is considered a reaction pattern of altered keratinization, with several possible etiologies, including topical application of antiperspirants, deodorants, local irritation and increased sweating in an occlusive environment. In children, other factors are involved, including the use of diapers, which contribute to creating heat, moisture, friction and maceration of the skin in the napkin area, and also the application of diverse products in this zone, including soaps, powders and

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**Figure 1.** Erythematous and papillomatous plaque covered by scales on the right axilla.

**Figure 2.** Closer view of the left axillary lesion.

**Figure 3.** Irregular acanthosis, laminated and compact hyperkeratosis, and a moderate lymphohistiocytic perivascular infiltrate (HE X40).

**Figure 4.** Parakeratotic hyperkeratosis with keratohyalin granules (HE X400).
pastes, especially those containing zinc oxide (3,4,6), which may increase the mitotic index of epidermal basal cells, thus inducing the hyperkeratotic and acanthotic appearance of granular parakeratosis (7). Since the description of granular parakeratosis about 20 years ago, no more than fifty cases have been reported in the literature (8,9), with two recent series with 18 (10) and 10 cases (11). The frequency of diagnosis of granular parakeratosis among total biopsy specimens in these series was 0.005% (10) and 0.004% (11); the failure in making a presumptive diagnosis was attributed to the lack of familiarity and encountering this process among dermatologists (10). Its main microscopic and diagnostic findings occur in a thickened stratum corneum, which typically shows parakeratosis and retention of keratohyalin granules. Differential diagnoses include contact dermatitis, acanthosis nigricans, inverse psoriasis, Darier disease, confluent and reticulated papillomatosis of Gougerot-Carteaud, and Hailey-Hailey disease, among others.

The most interesting feature in our case was the appearance of the same process twice, triggered by different circumstances. The first time, the lesions developed as a result of mild local irritation after changing a deodorant for an antiperspirant and the application of a zinc oxide paste. Two years later, the eruption occurred after excessive sweating attributed to major weight gain. We found only one literature report of recurrent granular parakeratosis in adults, affecting an obese woman in whom the lesions appeared during the preceding four winters, but resolved completely in several months (12).

There is no standardized therapy for granular parakeratosis and in some cases the condition resolved spontaneously. Individual cases have been reported with successful responses to the treatment with cryotherapy, topical corticosteroids, antifungal agents, retinoids, ammonium lactate and vitamin D analogues, among others (12,13). Calcipotriol, a vitamin D derivative, inhibits keratinocyte production, induces its normal differentiation, and acts as an immunomodulator, which accounts for the fast therapeutic response observed twice in our patient.

CONCLUSION
The lesions in our patient originated twice and under varied circumstances, suggesting that a constitutional factor may predispose the development of granular parakeratosis, which must be considered a reaction pattern that can be induced by multiple different causes. For histologic diagnostic purposes, given that the main features are localized in the stratum corneum, a biopsy specimen obtained by simple superficial shaving of the lesion would demonstrate parakeratosis, with retention of keratohyalin granules within a thickened stratum corneum, considered diagnostic of this process.

References