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Case Report

Disseminated annular granuloma: a rare dermatological manifestation of diabetes

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ABSTRACT

Granuloma annulare (GA) is a benign granulomatous dermatosis of unknown etiology. In adults, the most common clinical form is the localized variant, characterized by a non-scaly, erythematous violaceous ring-shaped plaque, followed by the disseminated form that predominantly affects the trunk and limbs. It has been associated with diabetes mellitus, dyslipidemia, and autoimmune disorders. Herein, we present a 70-year-old patient who is overweight and has hepatic steatosis, with lesions of confirmed disseminated annular granuloma through histopathology and a subsequent diagnosis of type 2 diabetes.

Keywords: Annular granuloma, Diabetes mellitus, Dermatology

INTRODUCTION

Granuloma annulare (GA) was first described in 1895 by Calcott Fox as a "ring eruption on the fingers." Radcliffe and Crocker, in 1902, named the condition with the current term.[1] It is a non-infectious, benign, self-limiting inflammatory disease of unknown etiology that presents with nodular lesions that coalesce to form ring-shaped plaques.[2] It has been associated with trauma, viral infections, immunosuppression, autoimmune disorders, malignant neoplasms, diabetes, and hyperlipidemia.[3,4] The pathophysiology involves the participation of helper T lymphocytes, transforming growth factor-beta (TGF-β), and interleukin.[2,5] There are four variants: localized, disseminated, perforating, and subcutaneous, with a recurrence rate of up to 40%.[3] Histopathological diagnosis is established by the presence of a focus of necrobiosis surrounded by palisading histiocytes with mucin deposits. Multinucleated giant cells are also a common finding, along with eosinophils, lymphocytes, and neutrophils infiltrating the dermis.[6]

CASE REPORT

A 70-year-old female patient presented to the dermatology clinic with cutaneous lesions on her trunk and lower limbs, sometimes accompanied by itching. She had a medical history of hepatic steatosis and untreated overweight, with no history of toxic habits. Physical examination revealed disseminated dermatosis on the abdomen, lower back, and right thigh (Figures 1 and 2), consisting of round, 1-4 cm erythematous-violaceous monomorphic papular plaques with a papular border at the periphery. Treatment was initiated with topical 0.10% fluocinolone. An excisional biopsy was performed on the abdominal region, showing lymphocytes, macrophages, multinucleated cells, perivascular distribution surrounded by collagen bands, papillomatosis in the epidermis, and basal layer pigmentation, leading to a diagnosis of chronic dermatitis with granulomatous reaction. Routine tests revealed fasting glucose >126 mg/dl, hypercholesterolemia, and hypertriglyceridemia. Subsequently, type 2 diabetes was

confirmed, and treatment was initiated with metformin 750 mg.

Figure 1: Erythematous-violaceous annular plaques scattered on the anterior surface of the abdomen.

Figure 2: Lesions with similar characteristics on the lower right limb.

DISCUSSION

Granuloma annulare is a benign necrobiotic condition characterized by small nodules with a ring-like arrangement, forming single or multiple lesions.[7] Classic histological examination shows a deep dermal infiltrate of granulomas composed of histiocytes surrounding a central area of degenerated collagen fibers (necrobiosis), with abundant mucin being a key characteristic distinguishing it from other granulomatous diagnoses.[2,4] As previously mentioned, GA is not only associated with diabetes mellitus but also with dyslipidemia and autoimmune disorders. Lesions can precede signs and symptoms of diabetes mellitus, and in its generalized form, it is associated with diabetes in 0.5 - 10% of cases.[8,9] The relationship is not well established, and it is unclear which pathology may precede the other; however, since diabetes involves elevated inflammatory cytokines (IL-6), T-cell and macrophage activation, it may act through dysregulated T-cell and Th1 axis activity implicated in the pathophysiology of granuloma annulare.[4,5] A retrospective cohort study from 2021 involving 51,169 patients with granuloma annulare reported that 21.1% of GA patients had diabetes mellitus, whereas only 13.3% of matched controls had DM.[4] This suggests that DM and hyperlipidemia may instigate granuloma annulare through a common pathway of T-cell dysregulation as mentioned earlier. The prognosis is generally good once treatment is initiated, which includes topical or intralesional corticosteroids, imiquimod cream, topical calcineurin inhibitors (tacrolimus, pimecrolimus), cryotherapy, and pulsed dye laser.[8] While localized disease tends to respond well to topical and intralesional corticosteroids, generalized GA remains challenging to manage and often refractory to corticosteroid treatment, prompting consideration of alternative therapies.

CONCLUSION

The importance of diagnosing granuloma annulare lies in the wide variety of its clinical presentations, necessitating accurate identification to initiate appropriate study and treatment plans. The localized type is the most commonly encountered form. In these patients, it is crucial to perform metabolic analyses (serum glucose, lipid profile), assess medication history, and consider autoimmune diseases if indicated by the clinical presentation. Above all, ruling out type 2 diabetes, the most common metabolic disorder in the Mexican population, is essential.

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