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ARTICLE



Chronic urticaria in a child affected by atopic dermatitis: effective treatment with omalizumab

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ABSTRACT

This article describes a clinical experience in a 7-year-old girl with chronic spontaneous urticaria and atopic dermatitis, resistant to therapy with antihistamines and topical steroid. Omalizumab treatment not only allowed complete remission of chronic spontaneous urticaria but also significantly improved atopic dermatitis symptoms. The off-label use of omalizumab was well tolerated and no adverse events were reported.

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KEYWORDS

Chronic urticaria; atopic dermatitis; omalizumab

Introduction

Chronic spontaneous urticaria (CSU) is a frequent skin condition affecting up to 20% of the population in the world, starting most frequently between 20 and 40 years, although it can affect all ages (1). Etiology remains unknown, despite several mechanisms have been suggested to have a role in urticaria pathophysiology, such as autoimmune disorder, abnormalities of tissue mast cells, and chronic infections (1–4).

CSU is characterized by recurrent eruptions of wheals, erythema, and itching, over a time of at least 6 weeks. Relapse may occur for decades (5–7).

Recent evidences support the critical role of IgE in CSU pathophysiology, through the degranulation of mast cells induced by their binding to FcεRI (8). It is possible to interfere with this mechanism by targeting IgE, and thus limiting its interaction with mast cells. Omalizumab is a humanized anti-IgE antibody that has been recently approved for the treatment of resistant CSU (9).

Atopic dermatitis (AD) is a chronic, relapsing, and highly pruritic dermatitis, which generally develops in early childhood. Patients commonly have elevated total IgE levels, sometimes markedly elevated, the level of which appears to correlate with disease severity (10). Atopic dermatitis is often associated with increased IgE production. Several studies have been published on the usefulness of omalizumab in the treatment of atopic dermatitis, reporting a good control of pruritus and an improvement in quality of life in treated patients who were refractory to other systemic therapies (11,12). Hence, Chan et al. are currently running a randomized, double blind placebo-controlled study to assess the efficacy of omalizumab in children with severe atopic dermatitis (13,14).

This article describes a recent clinical experience with a 7 years old girl suffering from a severe form of CSU and atopic dermatitis, resistant to therapy with antihistamines who was successfully treated with omalizumab.

Case report

Presentation and anamnesis

A 7-year-old girl, presented to our outpatient clinic with a 5-year lasting story of severe atopic dermatitis and recurrent episodes of hives since the age of 6.

She had been treated with topical corticosteroids as well as moisturizers and emollients daily and had received several courses of oral prednisolone (up to 40 mg/die for 5–7 days every two months). In addition, she had been on a cow milk and egg protein free diet for three years, on behalf of a decision of her parents, without any significant clinical improvement.

She reported about two or three episodes per week, characterized by wheals and itching, responding to treatment with antihistamines, but relapsing as soon as the therapy was stopped. Such episodes did not seem to follow to the exposure to triggering factors and therefore had been diagnosed as CSU.

At the first admission to our Pediatric Immunology and Allergy Department, she presented severe peeling skin and itching lesions of atopic dermatitis on her face, arms, legs and trunk as shown in Figure 1(a), with UAS7 = 35.

Diagnosis

Blood count, urinalysis, erythrocyte sedimentation rate (ESR), C reactive protein (CRP), liver, kidney and thyroid function were normal; C3, C4, autoantibody panel [anti-nuclear antibodies [ANA], extractable nuclear antigen (ENA), dsDNA], serum antibodies for hepatitis viruses, Epstein Barr virus (EBV) and cytomegalovirus (CMV) were negative; *Helicobacter pylori* in the stool, celiac disease screening, pharyngeal swab for group A *Streptococcus* were negative. Total serum IgE level was 200 mg/dl with negative skin prick tests for the main inhaler and food allergens, while the *in vitro* assay of specific IgE resulted in a positivity for *Dermatophagoides Pteronissinus* (1.4 kU/l) and *Alternaria* (1.05 kU/

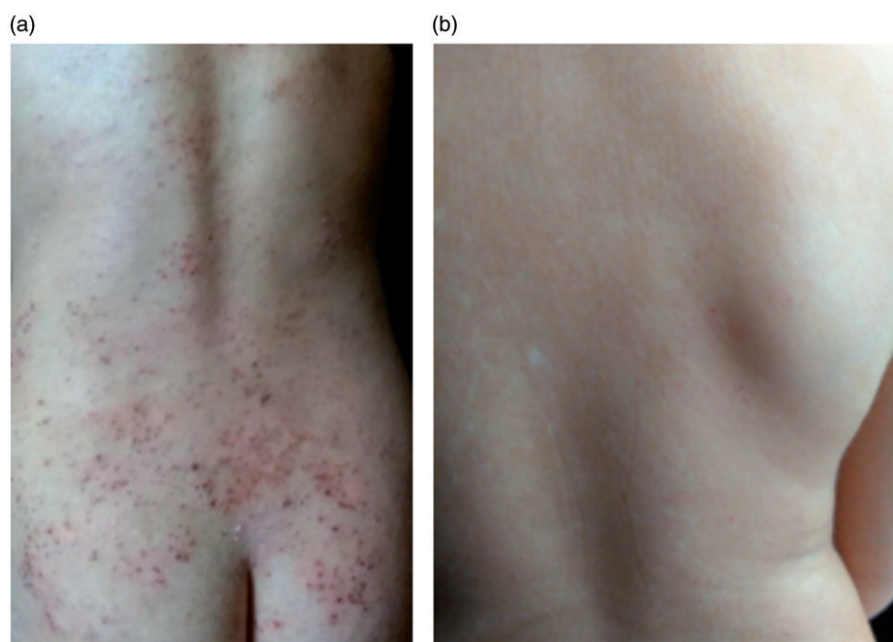


Figure 1. Skin lesions at presentation (a), and resolution (b) after treatment with omalizumab, in a girl affected by chronic urticaria and atopic dermatitis.

l). Again, no positive result in SPT, or specific IgE, for food allergen, was detected.

Diagnosis of atopic dermatitis and CSU was confirmed.

Therapy

Daily therapy with antihistamines was started. After a 4-month therapy with three doses per day of antihistamines, no remarkable clinical improvement of the dermatitis was reported and the frequency of hives did not significantly change. Any attempt to interrupt therapy was followed by immediate flare-up with wheals and itching.

On detailed cutaneous examination, a widespread xerosis was observed, associated with rash and itching injuries due to atopic dermatitis; impetigo was present in some sites. SCORAD (SCORing Atopic Dermatitis) was = 42, indicating moderate to severe disease. Because of a low weight gain for age and poor general conditions, bone metabolism exams were performed; a Z score = -1,5 at examination of the spine span L1-L4 by dual X-ray absorptiometry showed mild to moderate osteopenia.

As the clinical condition was serious and step up therapy with antihistamines did not control it, omalizumab was prescribed. The off-label use, at younger age than recommended, was approved by the local ethical committee. Hence, she received omalizumab 300 mc sc once per month. The first three doses of the drug were administered in the hospital, during fall season. Following the third administration, no more hives appeared and the itching was also definitely reduced, but beneficial effect started since the second administration. No adverse reaction was noted.

After the 6th month of treatment (corresponding to the sixth administered drug dose), lesions of atopic dermatitis significantly reduced, hesitating in diffuse cutaneous xerosis, itching and limited areas of eczema mostly involving skin folds (Figure 1(b)). UAS7=7 was recorded because of mild persistent pruritus probably due to atopic skin xerosis. SCORAD was = 16. Of notice, our patient has been treated with topic glucocorticoid during the first months of treatment with omalizumab, glucocorticoid have been gradually reduced since the sixth omalizumab administration

while skin-moisturizing products have never been stopped. At the time of this report, the patient was no longer on Omalizumab therapy: a total amount of 9 doses had been administered.

Discussion

Atopic dermatitis is a chronic skin disease that generally occurs in infancy and frequently associated with other allergic manifestations. Symptoms appear and can persist for long periods, showing some remission, usually followed by exacerbations. It is very upsetting with a striking negative effect on the patient quality of life. Moreover, variability in severity, in the clinical manifestations and in the response to therapy in atopic dermatitis is also known, probably as consequence of complex pathogenic mechanisms accountable for this disease. Due these multiple aspects of AD, the best therapeutic approach is still being argued.

Recently, systematic literature searches were performed by Holm et al. (15), assessing the effect of omalizumab treatment in AD. A percentage of 74 (129/174) patient experienced a positive effect of treatment. On the other hand, Snast and colleagues, stated that, comparing two randomized controlled trials and eight observational studies, with a total of 125 omalizumab patients, no significant improvement were found. Nonetheless, omalizumab has the advantage of being well tolerated in children, and, given that studies used different dosing and stratification by IgE levels, omalizumab may be effective in selected patients (16).

We show a case of a 7-year-old girl presented a 5-year story of severe atopic dermatitis. Beside, patient reported episodes characterized by wheals and itching, responding to treatment with antihistamines, but relapsing as soon as the therapy was stopped, about two or three per week, diagnosed as CSU. A conventional therapy with antihistamines was began, with any remarkable clinical improvement dermatitis symptoms, followed by immediate flare-up with wheals and itching when therapy was discontinued. Because of subject clinical severe condition, off-label use of omalizumab was approved. After the second omalizumab administration, hives disappeared and the itching was clearly decreased. No

adverse reaction was reported; at now, after 9 doses omalizumab administration, any atopic dermatitis lesion were observed.

Conclusions

Omalizumab treatment not only allowed complete remission of chronic spontaneous urticaria but also significantly improved atopic dermatitis symptoms, showing a good safety profile also in a 7-year-old girl. Indeed, the off-label use of omalizumab was well tolerated and no adverse events were reported.

Patient consent

Parents gave consent to the inclusion of material pertaining the patient into this article, they acknowledged that she cannot be identified via the paper; the Authors fully anonymized patient's material

Ethical committee consent

The local ethical committee approved the off-label use at younger age than recommended.

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Disclosure statement

The authors report no conflicts of interest.

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