

LETTER TO THE EDITOR

Cholinergic urticaria with hypohidrosis successfully treated with omalizumab

Dear Editor,

A 21-year-old woman presented with an 18-month history of papular wheals with mild pruritus and burning sensation. The papules frequently appeared temporarily during exercise, showering and when the patient was in a relatively warm environment. Oral antihistamines did not improve her symptoms. Subsequently, the patient became aware of hypohidrosis with heatstroke, muscle weakness and sickness when her skin symptoms were present. She had been treated for atopic dermatitis since infancy.

Upon examination, the patient had no symptoms. She did not have symptoms/signs including those of sicca syndrome. Laboratory testing revealed elevated serum immunoglobulin (Ig)E (1829 IU/mL), with no other abnormal results including serum proteins and Ig. Exercise tolerance test revealed that she did not sweat from any part of her body except the palms, and produced reddish papular wheals all over her back. We diagnosed her as having cholinergic urticaria with hypohidrosis.

The history of antihistamine failure led us to administrate 300 mg omalizumab at 4-week intervals. One week after the first dose of omalizumab, the frequency of the wheals was greatly reduced. After 3 weeks, the patient no longer had wheals or sweating problems. After three administrations of omalizumab, she was in remission. However, 6 weeks after the last dose, both papular urticaria and hypohidrosis recurred. Restarting omalizumab cleared her symptoms. Her symptoms of atopic dermatitis were also ameliorated with regular use of topical corticosteroids.

Cholinergic urticaria is a condition with papular wheals usually induced by heat and often accompanied by sweating disorder.

The mechanism of how cholinergic urticaria associates with sweat disorder is not yet clear. There are several hypotheses regarding the pathophysiology of sweat disorder. One of them is that autoimmunity against the eccrine sweat glands causes malfunction of the sweat ducts, which results in sweat leakage into the dermis, followed by an allergic reaction due to the degranulation of mast cells.^{1,2} Conventional treatment of cholinergic urticaria with corticosteroid or cyclosporin improved both skin and sweating symptoms in most cases.³

Omalizumab is a therapeutic monoclonal antibody that neutralizes IgE by binding to the Fcε3 domain of IgE. Omalizumab

reduces the number of IgE receptors on the cell membrane, which suppresses the release of histamine. Therefore, omalizumab is labeled for the treatment of refractory chronic urticaria and bronchial asthma.

Omalizumab has also been used successfully in the treatment of cholinergic urticaria.⁴

To the best of our knowledge, this is the first case report of both urticarial papules and hypohidrosis being successfully treated with omalizumab.

Patients who have an allergy to antigens against substances in sweat may experience edema by sweat leakage into the dermis. This local edema around the sweat duct may inhibit the flow. Thus, disappearance of wheals may instantly improve the patient's sweating function.

Concomitant atopic dermatitis was also improved during omalizumab treatment. Cholinergic urticaria with sweat allergy is often associated with atopic dermatitis, and a common antigen in these two different diseases has been reported.⁵ Omalizumab might have influenced both diseases in this patient. Further observation is needed.

CONFLICT OF INTEREST: None declared.

Yuka IHIBASHI-KUNIMI,  Shinichi IMAFUKU 

Department of Dermatology, Faculty of Medicine, Fukuoka University,
Fukuoka, Japan

REFERENCES

- 1 Munetsugu T, Fujimoto T, Oshima Y *et al*. Revised guideline for the diagnosis and treatment of acquired idiopathic generalized anhidrosis in Japan. *J Dermatol* 2017; **44**: 394–400.
- 2 Iwasaki A, Ito T, Nishiwaki K *et al*. A case of cholinergic urticaria with localized hypohidrosis showing sweat gland eosinophilic infiltration. *Allergol Int* 2017; **66**: 495–496.
- 3 Kuriyama S, Aoshima M, Tokura Y. Studies on hidrotic condition and sweating recovery after corticosteroid-pulse therapy in seven patients with acquired idiopathic generalized anhidrosis/anhidrotic or hypohidrotic cholinergic urticarial. *J Dermatol* 2016; **126**: 1263–1271.
- 4 Koumaki D, Seaton ED. Successful treatment of refractory cholinergic urticaria with omalizumab. *J Dermatol* 2018; **57**: 114.
- 5 Hiragun M, Hiragun T, Ishii K *et al*. Elevated serum IgE against MGL_1304 in patients with atopic dermatitis and cholinergic urticaria. *Allergol Int* 2014; **63**: 83–93.