

A case of recurrent facial angioedema associated with elevated tree pollen counts



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Clinical Implications

- High levels of tree pollen exposure in a patient with tree pollen sensitization may be associated with facial angioedema in the absence of other classic signs of aeroallergen sensitization, such as allergic rhinitis or asthma symptoms.

TO THE EDITOR:

In the majority of patients with recurrent angioedema, a specific etiology cannot be identified despite extensive testing. We report a case of an 8-year-old Caucasian girl who was admitted to the National Jewish Health Pediatric Day Program in June 2016 for evaluation of atopic dermatitis and 3 discrete episodes of perioral and periorbital angioedema during the spring season (March to May 2016). All 3 episodes of angioedema were preceded by a few hours of worsening atopic dermatitis with associated pruritus and occurred soon after playing outside. Each episode resolved after administration of antihistamine therapy (diphenhydramine). Her atopic dermatitis was managed with topical steroids and antihistamines as needed.

Because of the seasonal pattern to these episodes of angioedema and the history of preceding outdoor exposure, we examined tree pollen counts measured daily at National Jewish Health during March, April, and May of 2016 to determine if elevated tree pollen counts had occurred on days of reported angioedema. As the patient lived within the Denver aerodynamic basin approximately 20 miles from the pollen counting station, these pollen counts would be expected to reflect exposures where she lived.¹

This child's first episode of angioedema, occurring on March 23, 2016, was associated with an acute spike in cedar/juniper pollens (661 counts/m³); the second episode on April 15 was associated with elevated oak pollen (184 counts/m³); and the third episode on May 23 was associated with high concentrations of pine pollen (725 counts/m³). Daily pollen counts for cedar/juniper, oak, and pine during the months in which their concentrations spiked are illustrated (Figure 1, A, B, C, respectively). Notably, other pollens measured on those days were at low levels compared with the high levels of these specific pollens noted above. Skin prick testing was performed during this admission exclusively to the 3 relevant pollen species and was correspondingly positive to mountain cedar (wheal of 7 mm), oak (wheal of 9 mm), and pine (wheal of 5 mm). Given the temporal correlation with angioedema and the presence of sensitization to these pollens, we hypothesize that exposures to spikes in mountain cedar, oak, and pine pollen were responsible for her recurrent episodes.

Of note, this patient had previous prick skin tests performed approximately 1 year before her admission. At that time, the patient was skin prick positive to aspen (wheal of 8 mm), cottonwood (wheal of 5 mm), elm (wheal of 6 mm), and maple

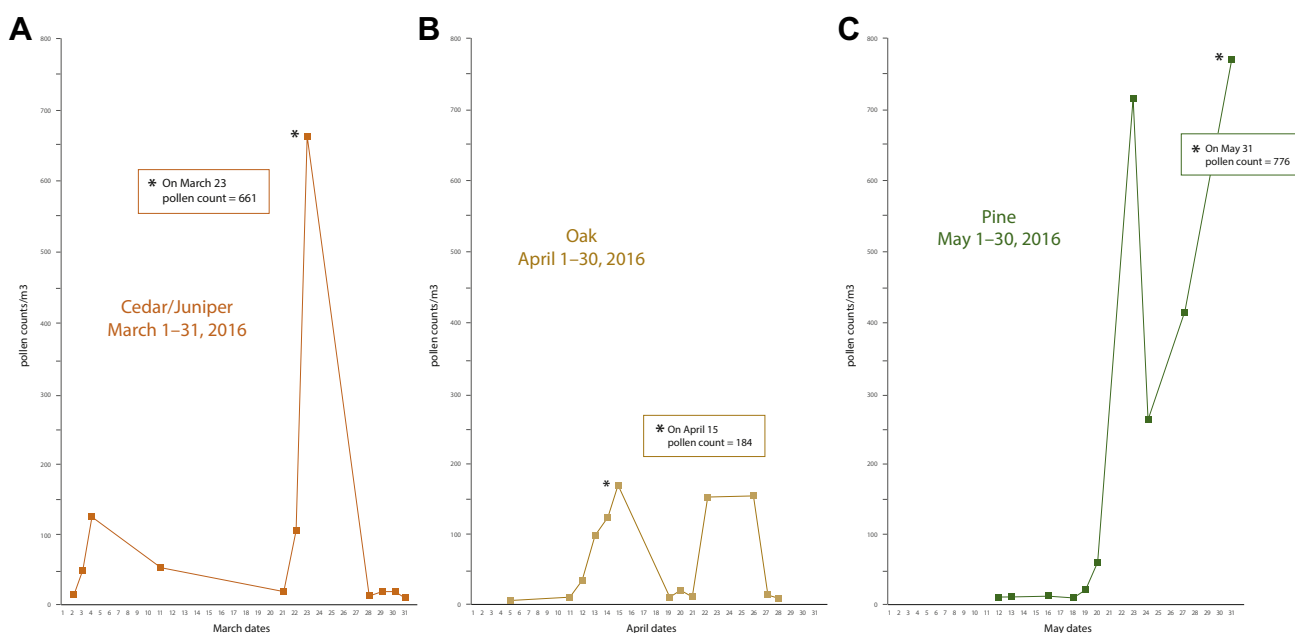


FIGURE 1. A, Time series of cedar/juniper pollen counts in March 2016. B, Time series of oak pollen counts in April 2016. C, Time series of pine pollen counts in May 2016.

(wheal of 7 mm) but negative to ash, pine, and juniper/cedar (oak was not tested). Thus, she had apparently become sensitized to cedar and pine within the year to those pollens associated with her angioedema episodes. The patient also tested positive to dog (wheal of 6 mm), but the family did not describe increased exposure to dog during these episodes.

Atopic dermatitis can present with periorbital erythema and edema in the setting of pollen exposure,² and this patient frequently had atopic dermatitis flairs without any angioedema. The acute nature of this patient's episodes and rapid resolution with diphenhydramine treatment, however, suggested a process consistent with angioedema distinct from her atopic dermatitis flares. An examination of photographs taken during the episodes also demonstrated periorbital and perioral swelling consistent with angioedema. The patient had no history of asthma or rhinitis and her physician did not document any rhinorrhea or nasal turbinate edema on examination during these episodes.

Our literature search identified one report linking pollen exposure and increased rates of angiotensin-converting enzyme inhibitor-induced angioedema³ and another describing urticaria and angioedema after the ingestion of an orange blossom⁴ but no reports of recurrent facial angioedema correlating with elevated tree pollen counts. Other possible etiologies for her episodes including latex allergy, thyroid disease, and hereditary angioedema were ruled out. Given these results and good response to diphenhydramine treatment acutely, we recommended prophylactic treatment with daily antihistamine therapy and future consideration of immunotherapy if needed.

This case demonstrates that high levels of tree pollen exposure in a patient with tree pollen sensitization might be associated with facial angioedema in the absence of other classic signs of aeroallergen sensitization such as allergic rhinitis

or asthma symptoms. As this was an observational finding in a single individual, we acknowledge that we cannot posit with certainty a cause and effect relationship. Nevertheless, we are hopeful that others will now use pollen time series to examine temporal associations with recurrent angioedema and determine if these findings are reproducible across populations.

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