Allergic reaction to mint leads to asthma

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ABSTRACT

Respiratory and cutaneous adverse reactions to mint can result from several different mechanisms including IgE-mediated hypersensitivity, delayed-type hypersensitivity (contact dermatitis), and nonimmunologic histamine release. Reactions to cross-reacting plants of the Labiatae family, such as oregano and thyme, as well as to the chemical turpentine, may clue the clinician in on the diagnosis of mint allergy. Contact dermatitis can result from menthol in peppermint. Contact allergens have been reported in toothpastes, which often are mint-flavored. Allergic asthma from mint is less well-recognized. A case of a 54-year-old woman with dyspnea on exposure to the scent of peppermint is presented in whom mint exposure, as seemingly innocuous as the breath of others who had consumed Tic Tac candies, exacerbated her underlying asthma. This case highlights the importance of testing with multiple alternative measures of specific IgE to mint, including skin testing with mint extract, and skin testing with fresh mint leaves. Additionally, this cases suggests that asthma can result from inhaling the scent of mint and gives consideration to obtaining confirmatory pre- and postexposure pulmonary function data by both impulse oscillometry and spirometry.

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Although food allergy reactions are becoming increasingly recognized,[1,2] adverse reactions on exposure to the mint plant and products containing mint and related plants are often unrecognized. We present a case of a newspaper reporter who wheezed when interviewing persons eating Tic Tac mint candy (Ferrero, USA).

CASE

The patient is a 54-year-old woman with the chief complaint, "I can't breathe near mint." Additionally, she has noted for the past year that her "right lung hurts near mint." When persons at work chew Tic Tacs (mints), she gets short of breath. In the context of her duties as a New York City reporter, she interviews many people, less than an arm's length away, who consume mints. Her asthma inhaler does not help with one puff. She has noted a significant exposure history to a mint garden, which she played in for hours at a time as a child, every summer. Mint-scented cleaning fluids make her shortness of breath worse.

Collateral allergic history is notable for seasonal allergic rhinitis because of known tree pollen allergy. Physical examination was unremarkable. Laboratory evaluation including pulmonary function tests and assessment for specific IgE to peppermint is shown in Tables 1–3 and Fig. 1.

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Question

In evaluating a patient who experiences severe exacerbations of asthma (without rash) near mint-containing products, what workup is most appropriate if serological measurement of specific IgE to mint is negative?

A. Skin test to mint extract and obtain pre- and post-lung function measurements on exposure to mint.
B. Patch test with menthol and peppermint to be interpreted on day 5 (D5).
C. Ask patient about reactions to oregano, thyme, and turpentine.
D. Refer patient for psychiatric consultation.

CLINICAL CHARACTERISTICS AND PATHOPHYSIOLOGY

The literature reports infants and children with contact dermatitis from menthol in peppermint.[3] Contact allergens have been reported in toothpastes, which often are mint-flavored.[4,5] Also, turpentine-induced sensitivity to peppermint oil has been noted.[6] D5 patch test reactions to menthol and peppermint are an available option.[7] Dental screening patch testing has been validated.[8] Contact sensitivity to menthol and peppermint has been reported in patients with intraoral symptoms.[9]

In addition, systemic reactions to ingestion of oregano and thyme are further related, because these and mint belong to the Labiatae family.[10] Skin tests with inhalants in a group of patients in one study were positive to grasses and with plants of the Labiatae

Table 1 **Spirometry pre- and postbronchodilator**

		Percent Predicted
Prebronchodilator		
FEV_1	2.59	88
FVC	3.53	97
FEV_1/FVC	73%	
Postbronchodilator		
FEV_1	2.69	92.3
FVC	3.44	99.6
FEV_1/FVC	78%	

FEV_1 = forced expiratory volume in 1s; FVC = forced vital capacity.

Table 2 **Pulmonary function testing pre– and post–mint exposure (inhalation)**

	Pre–Mint Exposure (6/23/10)	Percent Predicted	Post–Mint Exposure	Percent Predicted
FEV_1	2.46		2.46	
FVC	3.31		3.31	
FEV_1/FVC	74%		74%	
IOS* R5 Hz	2.2 (nl)	66.5	4.41#	122
IOS R20 Hz	1.6 (nl)	77	2.8 (nl)	88
IOS X5Hz	−13.03	2638	−18§	2506

**IOS after inhaling mint and skin prick test. IOS is a noninvasive way to measure the respiratory system impedance and reliably measures central and peripheral airways resistance at different oscillation frequencies.*
#R5 = 4.41–8 suggests mild small airways narrowing is increased.
§X5Hz = −18 abnormal suggests airway hyperresponsiveness.
FEV_1 = forced expiratory volume in 1 s; FVC = forced vital capacity; IOS = impulse oscillometry; nl = normal.

family, which comprises other plants such as mint (*Mentha piperita*) as shown in Fig. 2. Thus, plants belonging to the Labiatae family seem to show cross-sensitivity based on clinical history and *in vitro* and *in vivo* test results.[10] Histamine release caused by peppermint can also depend on nonimmunologic mechanisms.[11] Allergic asthma from mint is less well recognized.

DIAGNOSIS

In summary, this 54-year-old woman was symptomatic with dyspnea near peppermint and had a positive skin-prick test to a commercial peppermint extract.

Table 3 **Testing for specific IgE**

	SPT (wheal/flare)	*In Vitro*
Histamine	5/10	
Saline	0/0	
Fresh mint leaves	0/0	
McCormick Pure Peppermint Extract*	5/10	
Mentha piperita (peppermint)		<0.10 KU/L

**McCormick & Company, Inc., Sparks, MD.*

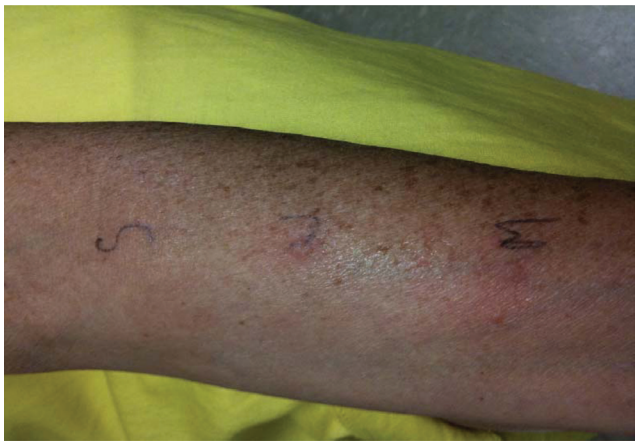

Figure 1. *Skin test to peppermint: Saline is labeled S to the far left and is negative; histamine is in the middle and raised a 5-mm wheal and 2-cm flare. Mint is to the right and raised a 5-mm wheal and 2-cm flare.*

Mint exposure, as seemingly innocuous as Tic Tacs, exacerbated her underlying asthma. Objective testing pre- and postexposure to peppermint confirmed reduced lung function, suggesting the diagnosis of allergic asthma triggered by mint, in this woman who may have been sensitized by inhaling mint in her garden as a child. Impulse oscillometry (IOS), a noninvasive measure of small airways impedance showed increased airways resistance from an R5 of 2.2 at baseline, increasing to 4.4. This patient should avoid mint exposure and take albuterol metered-dose inhaler with Aerochamber.

This case highlights the importance of testing with multiple alternative measures of specific IgE to mint, including skin testing with mint extract and skin testing with fresh mint leaves. Additionally, this case suggests that asthma can result from inhaling the scent of mint and gives consideration to obtaining confirmatory pre- and postexposure pulmonary function data by both IOS and spirometry. This case also suggests that serological tests

Figure 2. *Peppermint. (Borrowed with permission courtesy of White Flower Farm, Litchfield, CT.)*

for IgE to peppermint are less sensitive than skin-prick testing.

MANAGEMENT

The patient was comforted by having obtained a definitive diagnosis of her symptoms. Previously, she thought that she was imagining her adverse reactions. It helped alleviate tension between the patient and her colleagues and led to the recommendation to take her albuterol inhaler p.r.n. and avoid situations with exposure to mint.

As allergists/immunologists caring for children and adults, we have the opportunity to recognize and prevent adverse reactions from mint exposure. As the aforementioned case illustrates, these exposures may be previously unrecognized sources of anxiety and morbidity.

Correct Answer to Question: A and C

Clinical Pearls

- Allergic asthma can result from inhaling the scent of mint.
- Pre- and post-IOS may be more sensitive than spirometry to assess acute small airways narrowing on exposure to mint.
- Skin testing with mint extract may be more sensitive than specific serum IgE to mint.
- D5 patch testing may determine if a delayed contact dermatitis to mint is present but does not verify if an immediate hypersensitivity reaction is present.
- Lichenoid oral lesions have been reported with menthol mouthwashes.[9]
- Reactions to cross-reacting plants such as oregano and thyme, as well as the chemical turpentine, may clue in the clinician on the diagnosis of mint allergy.

Clinical Pitfalls

- Other physicians dismissed the patient's complaints on exposure to mint and did not request skin testing.
- Spirometry may be insensitive compared with IOS, which is not widely available.
- Gell-Coombs immediate hypersensitivity (type I) is tested with the skin-prick test but Gell-Coombs type IV is assessed with D5 patch testing.
- Many dental products contain mint, and even asthma medication Aerobid M (Forest Laboratories, New York, NY) contains menthol.

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