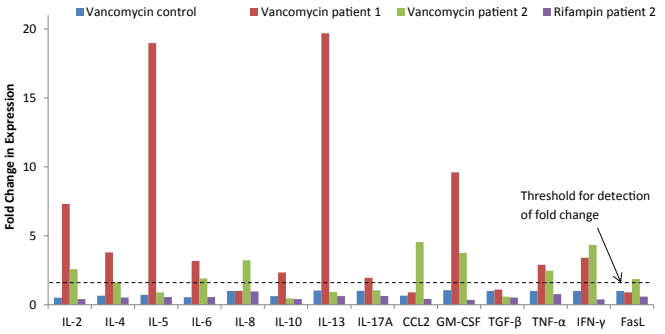

Figure 1. Lymphocyte cytokine expression profile. Relative expression of genes in peripheral blood mononuclear cells (PBMCs) from a patient incubated with vancomycin (vancomycin patient 2), a patient incubated with rifampin (rifampin patient 2), a different patient with drug reaction with eosinophilia and systemic symptoms syndrome (vancomycin patient 1), and a control receiving vancomycin (vancomycin control) shown as a fold change. FasL indicates Fas ligand; GM-CSF, granulocyte-macrophage colony-stimulating factor; IFN-γ, interferon γ; IL, interleukin; TGF-β, transforming growth factor β; TNF-α, tumor necrosis factor α.

may be heterogeneity within eosinophilic T-cell responses; however, the end result of eosinophil activation provides a similar clinical picture. Differential cytokine responses is not surprising because there is already described heterogeneity in the clinical and histological patterns of DRESS.[6,7] Furthermore, it is possible that there could be features of T_H1 responses in DRESS syndrome, as evidenced by the increase in IFN-γ in our patient, and possibly a component of $CD8^+$ T-cell stimulation as well, given the increase in FasL expression and the skin exfoliation observed clinically. Alternative explanations include the possibility of disease progression from DRESS syndrome to epidermal necrolysis reactions or an overlap syndrome between the two.[8] Lastly, knowledge of cytokine profiles might help distinguish which patients would be candidates for emerging therapies, such as intravenous immunoglobulin.[9]

This case highlights the heterogeneity of T-cell–mediated drug hypersensitivity reactions and supports the utility of PBMC gene expression testing as a potentially useful tool to identify causative drugs and characterize the mechanism of drug reactions. Furthermore, the observation of vancomycin-induced DRESS syndrome in multiple patients raises the question of whether this drug may play a larger role in these drug hypersensitivity reactions than previously appreciated. A review by Young et al[10] in 2014 found only 19 cases of vancomycin-induced DRESS syndrome in the literature; however, 9 of these were reported after 2012. Included within this review was an 18-month review of DRESS syndrome cases at Massachusetts General Hospital, where 5 of the 6 cases of DRESS syndrome were attributable to vancomycin.[11] We believe these speak to vancomycin-induced DRESS syndrome as an emerging player in drug hypersensitivity reactions. As more cases are described, we believe there will continue to be heterogeneous presentations of the disorder, and perhaps the use of PBMC gene expression will help distinguish different phenotypes with DRESS that ultimately may help with prognosis and treatment for patients.

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Approach to food allergy diagnosis and management by nonspecialty practitioners

In the United States, food allergy affects as many as 8% of children.[1] Pediatricians are often the first health care professionals to encounter these patients. National Institute of Allergy and Infectious Disease–sponsored guidelines for the management of food allergy advise the appropriate use of diagnostic tests, allergen avoidance education, epinephrine autoinjector (EAI) prescription and training, and provision of anaphylaxis emergency action plans (EAPs).[2] Previous studies[3,4] have found a lack of adherence with these guidelines. Another study[5] also found that only 20% of pediatricians felt comfortable interpreting food allergy test results, and others felt inadequately prepared to care for food allergic children. This study assesses parental report of physician management before referral to an allergy specialist for evaluation of food allergy.

An anonymous questionnaire (Fig 1) was distributed to all English-speaking families presenting for an initial consultation with a pediatric allergist at the Icahn School of Medicine at Mount Sinai between March 2014 and February 2015. The study was conducted in 2 pediatric allergy practices that differ in type of insurance plans accepted (commercial vs state). Statistical analysis was performed with GraphPad (GraphPad Software, La Jolla,

Disclosures: Authors have nothing to disclose.

Age of child:
Gender (circle): Male Female

Was your child referred for possible food allergy? Yes No

What food(s) are you or your doctor worried about? _____

Who referred you to see an allergist?
1. Pediatrician
2. Emergency room physician
3. Allergist
4. Other: _____

Why were you referred?
1. My child had an allergic reaction to a food.
2. My child has positive test results for foods.
3. We have a family history of food allergy.
4. I am worried about food allergies even though my child has not had a reaction.
5. I am not sure why I was referred.
6. Other: _____

Did the referring physician advise your child to avoid specific foods? Yes No

Did the referring physician discuss how to avoid the specific food(s)? Yes No
(For example, read ingredient labels, cross-contamination issues)

Did the referring physician suggest substitutes for the foods avoided? Yes No

Did the referring physician prescribe an EpiPen or Auvi-Q? Yes No
If yes, did you fill this prescription? Yes No
If it was prescribed, were you or a guardian trained in how to administer it? Yes No

Did the referring physician provide a written emergency plan
to describe how to manage allergic reactions? Yes No

Did the referring physician perform testing for food allergies? Yes No

If testing was done, which ones were performed?
1. Skin testing
2. IgE testing
3. Component testing (for example, UKnow peanut)
4. I don't know

If the referring physician sent blood tests for allergy, which foods were tested?
1. Only foods that we were concerned about were tested.
2. Tests were performed for many different foods.
3. I don't know.

Figure 1. Questionnaire distributed at initial food allergy consultation.

California). Comparison of categorical data was performed with the Fisher exact test with a 2-tailed *P* value. This study was deemed exempt from Mount Sinai Institutional Review Board approval because no identifying information was collected as part of the survey.

The parents of 120 children completed the questionnaire. Most were referred with a history of reaction to a food allergen (85%), with 34.2% having concerns for more than one food. Pediatricians provided most of the referrals (93%) (Table 1).

Of the 48 patients (40%) who underwent diagnostic testing before referral to an allergy specialist, 88% had food specific IgE levels drawn. Of these, 83% were tested to many different foods, including foods other than those in question and some foods the child was already tolerating regularly.

Eighty percent were advised by their referring physician to avoid the food(s) in question. Half recalled receiving specific instructions on how to avoid the allergenic food(s), with 18 patients receiving food substitute recommendations.