RESEARCH LETTER

ONLINE FIRST

Management of Antimicrobial Allergies by Infectious Diseases Physicians

Misconceptions about true antimicrobial allergy may result in less effective, more expensive therapy and adverse outcomes.[1,2] Correctly identifying allergies could significantly reduce the immediate and direct risks of drug-related adverse events.[3] For example, 9 of 10 patients who reported an allergy to penicillin were, in fact, not, when evaluated by skin testing (ST).[4] To appropriately use first-line agents, it is important to determine if the patient truly has an antimicrobial allergy. Such efforts could contribute to better antimicrobial stewardship.

Methods. To better understand physicians' perceptions and knowledge about allergy, a 10-item survey was e-mailed to Infectious Diseases Society of America (IDSA) Emerging Infections Network (EIN) members, a sentinel network of infectious diseases (ID) physicians across North America. Data were analyzed using SAS version 9.3 statistical software (SAS Institute Inc).

Results. Of 1411 IDSA EIN members, 744 (53%) responded: 72% were adult ID physicians; 23%, pediatric ID physicians; and 5%, both. A total of 78% had been consulted at least once in the last month about antimicrobial management of patients with "antimicrobial allergy." The most common sources of information for the allergy history were the patient or family member (97%) and medical records (89%). Perceptions of the usefulness of selected questions when assessing an antimicrobial allergy are given in the **Table**. Respondents indicated that ID physicians often "dispel" incorrect allergies and suggested more efforts to educate health care providers.

Penicillin ST was available to 60% of respondents and was performed mostly by allergy and/or immunology physicians (90%). Of the respondents with available testing, 88% reported that preoperative ST was available for elective surgical procedures, but of these, such ST was not routinely performed in 75%. Main barriers to penicillin ST were unavailability of ST materials or personnel (eTable; http://www.jamainternalmed.com).

To assess the care of patients with possible allergies, we developed clinical scenarios. Case 1 was an adult with remote history of mild skin reaction to a sulfa medication, diagnosed as AIDS and severe *Pneumocystis jiroveci* pneumonia. Respondents selected trimethoprim-sulfamethoxazole (TMP-SMX) (35%), TMP-SMX desensitization per protocol (32%), or alternative agents (33%). Case 2 had a remote history of mild pruritic skin reaction to penicillin and was receiving vancomycin for methicillin-susceptible *Staphylococcus aureus* (MSSA) bacteremia. Of the respondents, 64% changed to a β-lactam medication without ST; 24% discontinued vancomycin therapy and started a β-lactam–only therapy if the ST result was negative; and 12% continued vancomycin therapy without ST. Case 3 had a history of mild β-lactam allergy and required treatment for MSSA bacteremia. Respondents selected 1 or more of the following options: cephalosporin (81%), vancomycin (20%), daptomycin (12%), penicillin ST (12%), a β-lactam (7%), and a carbapenem (6%).

An IDSA guideline on management of antimicrobial allergy was perceived as the educational resource most likely to be useful (92%), followed by online training (37%) and campaigns for patients and health care providers (33%).

Discussion. Our study shows that ID physicians are frequently consulted to evaluate patients with antimicrobial allergies. This is not surprising because 25% of hospitalized patients requiring antimicrobial therapy report allergy to at least 1 agent, usually penicillin.[5] Most respondents reported that a thorough history and review of the medical record were the most informative and cost-effective ways to avoid the use of unnecessary alternative antimicrobials. Importantly, studies have shown that "allergy labels" are overused, lead to misclassification of patients as allergic, and are associated with increased

Table. Rank Order of Infectious Diseases Physicians' Perceptions About the Usefulness of Each of the Following Questions in the Diagnosis of Allergy[a]

Perceptions	No. of Respondents	Ranking	
		Mean	Median
Receipt of same antibiotic/class since initial reaction	668	1.11	1
Characteristics of the reaction	667	1.19	1
Patient's recollection of the reaction	669	1.61	1
Reported allergies to other agents	665	2.07	2
Time from beginning antibiotic to onset of reaction	669	2.16	2
Patient's age at the time of the initial reaction	666	2.34	2
Other concurrent medications	669	2.41	2
Purpose of taking antibiotic	669	3.29	3

[a] Ranking: 1 = very useful, 3 = neutral, and 5 = not at all useful.

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length of stay, receipt of more than 1 antibiotic and worse outcomes.[6] Some studies have shown that penicillin ST can reduce unnecessary use of alternative agents.[7] Skin testing has a high negative predictive value (99.3%), and a 40% to 100% positive predictive value for identifying patients at low risk for developing IgE-mediated reaction to β-lactams.[1]

In our vignettes, one-third of respondents would have treated with an alternative antimicrobial, although TMP-SMX is recommended as first-line therapy for *P jiroveci* in national human immunodeficiency virus guidelines. In cases 2 and 3, a nontrivial proportion of respondents selected vancomycin or other non–β-lactam antimicrobial. These results have important implications because treatment of MSSA bacteremia with nafcillin or cefazolin is independently associated with a 79%-lower adjusted rate of mortality compared with vancomycin.[8] In addition, switching from vancomycin to a β-lactam therapy in patients with MSSA bacteremia is associated with reduced mortality compared with the patient remaining on vancomycin therapy.[8,9]

When treating severe staphylococcal infections, physicians must balance the relative ease of continued administration of potentially less-effective antimicrobials with the more effective but challenging administration of β-lactams. Despite existing recommendations suggesting prudent vancomycin use, this agent continues to be inappropriately used, particularly for patients reporting questionable penicillin allergy.[5]

In conclusion, our results show that ID physicians play an important role in diagnosing and caring for patients who report antimicrobial allergies. Further research is needed to evaluate the impact of reported allergies on antimicrobial stewardship, the importance of drug reconciliation, a detailed history, and the clinical usefulness of ST to confirm allergy reports. More accurate use of "allergy labels" may improve antimicrobial use by allowing clinicians to safely prescribe more first-line agents (eg, penicillin). Antimicrobial-specific guidelines from IDSA should be considered to assist ID physicians in allergy management.

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Online-Only Material: The eTable is available at http://www.jamainternalmed.com.
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