Many antibiotic substitutions for self-reported penicillin allergies likely unnecessary

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Hospitalized patients who report an allergy to penicillin are often prescribed alternative antibiotics for infection that can be harmful, even though diagnostic testing or evaluations would show that the vast

majority of these reported allergies could be disproven, according to researchers from Massachusetts General Hospital.

In a national study published in *JAMA Internal Medicine*, the team found that the 16% of hospitalized patients with a documented penicillin allergy were twice as likely to be prescribed alternative antibiotics. Given that more than 90 percent of documented penicillin allergies are unconfirmable, those antibiotic substitutions by physicians were likely unnecessary.

"Too often clinicians are making inferior antibiotic decisions based on unverified penicillin allergy histories that may date back to a patient's childhood and are no longer valid," says Kimberly Blumenthal , MD, MSc, with the Division of Rheumatology, Allergy, and Immunology, MGH, and lead author of the study.

"As a result, patients are often prescribed antibiotics other than penicillins and cephalosporins—some of our core infection fighters—that may increase the risk of adverse side effects and antibiotic resistance.

"This pattern could be changed with a little more testing or, in many cases, by simply taking the time to talk to patients in order to learn more about a reported penicillin allergy, instead of taking the penicillin allergy label at face value."

Approximately half of hospitalized patients today receive antibiotics to treat or prevent infections caused by bacteria, and more than 10 percent have a penicillin allergy documented in their medical records.

In the first study to investigate antibiotic use patterns in documented penicillin allergy on a national scale, Mass General researchers combed the records of nearly 11,000 patients at 106 hospitals.

They found that the 16 percent of inpatients with a penicillin allergy on their medical records were typically treated with β-lactam alternative antibiotics, including significantly increased use of clindamycin, linezolid, fluoroquinolones, aminoglycosides, tetracyclines, and vancomycin.

The highest risk exposure was to clindamycin, which is associated with C difficile infection. Patients with a documented penicillin allergy were five times more likely to be given clindamycin than those without such an allergy.

Another key finding involved inpatients with a documented penicillin allergy who received antibiotics as prophylaxis for an upcoming surgical procedure to prevent infections. Although a β-lactam is the recommended antibiotic for this indication in most cases, the study found that patients with a documented penicillin allergy were nine-fold less likely to receive a β-lactam, but seven-fold more likely to receive a β-lactam alternative antibiotic.

"Hospitals should especially be targeting penicillin allergy evaluations for patients with planned surgical procedures and those who are otherwise likely to be prescribed clindamycin," says Rochelle Walensky, MD, MPH, chief of Infectious Diseases at MGH, Steve and Deborah Gorlin MGH Research Scholar and senior author of the study.

"For patients who claim a penicillin allergy, those interventions could be as simple as asking the right questions and compiling a comprehensive history. Unfortunately, antibiotic decisions are often made based on limited information or without a thorough investigation. We learned from our study that antibiotic prescribing without full allergy information can ultimately do the patient more harm than good."

Blumenthal, an expert in allergy and immunology, underscores the need

for hospitals across the country to more aggressively address penicillin allergy risk detection. While a diagnostic test exists to help clinicians accurately make that determination, less than half of hospitals have access to it, she points out.

"Hospitals should clearly be treating patients with the most targeted and effective antibiotic for their infection, rather than being influenced by a penicillin reaction years earlier that might have been nothing more than itching or a headache," Blumenthal declares. "That will require hospitals to become much more vigilant and proactive in penicillin allergy assessment as part of their inpatient antibiotic stewardship programs."

More information: Kimberly G. Blumenthal et al, Association Between Penicillin Allergy Documentation and Antibiotic Use, *JAMA Internal Medicine* (2020). DOI: 10.1001/jamainternmed.2020.2227

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