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The Use of Penicillin Skin Testing to Assess the Prevalence of Penicillin Allergy in an Emergency Department Setting

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STUDY OBJECTIVE: Patient-reported penicillin allergies are often unreliable and can result in unnecessary changes in antibiotic therapy. Although penicillin allergy skin testing is commonly performed in allergy clinics, it has not been used in emergency departments (EDs) to verify self-reported allergies. We hypothesize that ED-based testing is possible and that the false-positive rate of patients with self-reported penicillin allergy are greater than 90%.

METHODS: This prospective observational cohort study enrolled a convenience sample of ED patients with a self-reported penicillin allergy. Patients were enrolled by one of 2 emergency physicians who performed skin prick and intracutaneous tests with penicillin major and minor determinants. The total testing time was 30 minutes. The proportion of false-positive self-reported allergies was computed with 95% confidence intervals (CIs) by using the score method.

RESULTS: A total of 150 patients (mean age 42 years; SD 16 years; 46% men; 47% black) were enrolled. The false-positive rate for self-reported penicillin allergy was 137 of 150 (91.3%; 95% CI 85.3% to 95.1%). There were no adverse reactions associated with penicillin skin testing. Compared with patients with a false-positive penicillin allergy result (confirmed by negative penicillin skin testing result), patients reporting a true penicillin allergy confirmed by positive penicillin skin test results tended to be more frequently men (61.5% versus 44.5%; Delta 17.0%; 95% CI -13.5% to 42%), black (69.2% versus 44.5%; Delta 24.7%; 95% CI -6.9% to 46.8%), and have no family history of drug allergy (7.7% versus 17.5%; Delta 9.8%; 95% CI -20.9% to 20.4%), but self-reported other drug allergies more frequently (61.5% versus 38.7%; Delta 22.9%; 95% CI -7.7% to 47.5%).

CONCLUSION: Penicillin skin testing is feasible in the ED setting. A substantial number of patients who self-report a penicillin allergy do not exhibit immunoglobulin E-mediated sensitization to penicillin major and minor determinants. Penicillin testing in the ED may allow the use of more appropriate antibiotics for patients presenting with a history of penicillin allergy.

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