Penicillin Allergy Testing

An outpatient nurse-driven program for patients with cancer

Sejal Morjaria, MD, Faye Inumerables, MSN, RN, ACNS-BC, OCN®, Dhruvkumar Patel, MS, Nina Cohen, PharmD, BCPS, AQ-ID, Susan Seo, MD, Susan Posthumus, BSN, RN, OCN®, Steven C. Martin, MD, Anna Kaltsas, MD, MS, Shawna Lee, BS, Nicole Boucher, MPA, and Erica Fischer-Cartlidge, DNP, CNS, CBCN®, AOCNS®

BACKGROUND: Penicillin allergy testing (PAT) can decrease the use of unnecessary antibiotics by clarifying who is truly allergic.

OBJECTIVES: This article describes the development and implementation of an oncology outpatient nurse-driven PAT program.

METHODS: A nurse-driven program, initiated with allergy screening at the first encounter, was designed to identify patients with oncologic diagnoses eligible for PAT. Once verified eligible, patients undergo a three-step testing process (scratch test, intradermal injection, and IV challenge dose) administered by the infusion nurse.

FINDINGS: From November 2018 to December 2019, 82 outpatients with reported penicillin allergies were screened; 90% were eligible for PAT, and 97% of patients tested were negative for penicillin allergy. A significant reduction in aztreonam use among patients admitted for hematopoietic stem cell transplantation was also noted as compared to before PAT was offered.

KEYWORDS
penicillin; penicillin allergy testing; oncology; allergy screening

DIGITAL OBJECT IDENTIFIER
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NURSING INVOLVEMENT IS RECOGNIZED AS AN ESSENTIAL COMPONENT of national antibiotic stewardship efforts by the American Nurses Association (ANA) and the Centers for Disease Control and Prevention (CDC) (Monsees et al., 2019). Among these efforts, the CDC (2017) recommends penicillin allergy testing (PAT) to appropriately confirm allergies before prescribing antibiotics. Although numerous agencies have emphasized that antibiotic stewardship efforts have an interprofessional approach, practical guidance for how to do this is lacking (Monsees et al., 2019). This article will describe the development and implementation of an outpatient nurse-driven PAT program and the importance in patients with cancer.

Background

Penicillin allergy is the most commonly reported drug allergy, with about 10%–20% of the U.S. population reporting it (Alharbi, 2019; Gonzalez-Estrada & Radojicic, 2015). However, more than 90% of previously allergic patients can tolerate penicillin without developing a reaction (Sacco et al., 2017). Penicillin and other beta-lactam derivatives are often withheld based on a self-reported allergy, and, instead, second-line antibiotics that may be less effective, more expensive, or more toxic are used (Baden et al., 2016). For example, aztreonam, a second-line alternative antibiotic, costs three times as much as piperacillin/tazobactam and is associated with decreased susceptibility for *Pseudomonas aeruginosa*, a bacterium commonly responsible for pneumonia and postoperative infections (Solensky, 2014).

Patients with a self-reported penicillin allergy have been shown to have longer hospital stays and increased rates of methicillin-resistant *Staphylococcus aureus* and *Clostridium difficile* (Blumenthal et al., 2018), likely as a result of alternate antibiotic use. For these reasons, the 2016 antimicrobial stewardship guidelines from the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America endorsed PAT for those with allergies greater than five years ago and lower risk (i.e., not anaphylaxis) to improve the use of first-line antibiotics (Barlam et al., 2016). Although a variety of patient populations stand to benefit from PAT, the oncology population may derive a significant benefit because of their