1786. Safety, Efficacy, and Clinical Impact of Penicillin Allergy Skin Testing in Immunocompromised Cancer Patients at a Comprehensive Cancer Center
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Session: 217. Antimicrobial Stewardship: Impact of Allergy Saturday, October 6, 2018: 12:30 PM

Background. Patients reporting penicillin (PCN) allergies often receive alternative antibiotic therapy associated with significant health and economic disadvantages. The use of penicillin allergy skin testing (PST) to rule out PCN allergies is safe and effective in immunocompetent patients, yet data in immunocompromised patients are limited.

Methods. A quality improvement process using PST to clarify PCN allergies and guide antibiotic therapy was implemented at MD Anderson Cancer Center (April–October 2017). Patients admitted to Leukemia and Genitourinary Medical Oncology (GUMO) services with a history of Type I reactions to PCN were eligible.

Results. A total of 218 consecutive patients with reported PCN allergies were screened; 100 met inclusion criteria, were consented, and underwent PST (67 leukemia, 33 GUMO). Sixty-one percent of tested patients reported cutaneous reactions, and 79% reported reactions >20 years ago. The most common reported allergy was to penicillin V/G (64%). Forty-eight percent were on steroids and 49% were on immunosuppressive therapy at the time of PST. For leukemia patients the median absolute neutrophil count was 0.78 (0–64.88 K/μL) and absolute lymphocyte count was 0.81 (0–116.71 K/μL). Ninety-five percent patients tested negative for PCN allergy and 4% were positive (three Leukemia, one GUMO). One test was indeterminate (negative histamine control). After PST, 25 of 67 (37%) patients receiving antibiotic therapy were changed to an alternative antibiotic. Twenty-nine patients underwent penicillin oral challenge between May 31, 2017 to April 30, 2018, with 15% of those with cancer, 8 (53%) were male, median age 56 years (IQR 44, 67), 15 (100%) avoiding penicillin, and 7 (47%) penicillin challenge was positive.

Conclusion. PST is safe and effective to rule out PCN allergies in immunocompromised patients, with 95% of patients testing negative for PCN allergy, suggesting that patient-reported allergy is unreliable. The rate of negative tests is comparable to published patients, with 95% of patients testing negative for PCN allergy, suggesting a high level of agreement.

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1787. The Safety and Efficacy of an Oral Penicillin Rechallenge Program in Cancer Patients: A Pilot Multicenter Study
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Background. Patient-reported antibiotic allergies (so-called antibiotic allergy labels [AALs]) are found in one in four cancer patients and significantly impact patient outcomes. Whilst 85% of AALs can be removed by skin testing, the role of simple point-of-care oral penicillin rechallenge in this cohort remains unknown. We report on a novel penicillin rechallenge program in cancer patients.

Methods. An oral penicillin rechallenge program was implemented at Austin Health (Melb, Aus) and Peter MacCallum Cancer Centre (Melb, Aus) on May 31, 2017. Patients were prospectively identified by Infectious Diseases and antimicrobial stewardship (AMS) services at both sites and reviewed by the conjoint Antibiotic Allergy Service for suitability as per the criteria outlined in Figure 1. Patients underwent supervised challenge with oral penicillin VK 250 mg or amoxicillin 250 mg, dependent on reported index allergy, and observed for 2-hours post. Patients were followed for up to 12 months post for adverse events and antibiotic usage.

Results. Twenty-nine patients underwent penicillin oral challenge between May 31, 2017 to April 30, 2018, with 15% of those with cancer, 8 (53%) were male, median age 56 years (IQR 44, 67), 15 (100%) avoiding penicillin, and 7 (47%) penicillin challenge was positive.

Conclusion. A pilot penicillin oral rechallenge program was safe in cancer patients. This program serves as a future model for active “de-labelling” in carefully selected cancer patients, without formal allergy services, aiding AMS programs.

Figure 1. Selection algorithm for oral penicillin rechallenge program.

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1788. Cost-Effectiveness of Penicillin Skin Testing Among Patients With Methicillin-Sensitive Staphylococcus aureus Bacteremia and Reported Penicillin Allergy
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Background. Methicillin-sensitive Staphylococcus aureus (MSSA) bacteremia is a highly lethal infection; first-line therapy with β-lactam, commonly cefazolin, provides a significant mortality benefit over the second-line therapy, vancomycin, which is often used in patients reporting β-lactam allergy.

Methods. We designed a cost-effectiveness model of inpatients aged 55–75 years with MSSA bacteremia and a self-reported history of β-lactam allergy. The model adopted a US health-system perspective, a lifetime horizon, and a willingness-to-pay threshold of $100,000 per quality-adjusted life year (QALY). We compared routine care (vancomycin), history screening (questionnaire assessing anaphylaxis history), and bedside penicillin skin testing. Incremental cost-effectiveness ratio (ICER) was measured using 2017 US dollars per QALY. Baseline co-morbid states (diabetes, malignancy, and end-stage renal disease [ESRD] requiring dialysis) were also modeled. Future costs and benefits were discounted at 3% per year.

Figure 1. Selection algorithm for oral penicillin rechallenge program.

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Results. Among patients with MSSA bacteremia and a self-reported penicillin allergy, skin testing produced the best clinical outcomes and was cost-effective relative to history screening, generating 0.51 additional QALYs at an ICER of $22,062 per QALY gained. Among patients with diabetes, malignancy, or ESRD, the ICER for skin testing relative to history screening increased to $30,830–$127,182, reflecting the overall lower life expectancy and high annual survivor healthcare cost in these higher risk groups. Results were robust to wide variations in the cost and diagnostic performance of skin testing; in sensitivity analyses, skin testing remained the optimal strategy when cost was <$5600, specificity >60%, and sensitivity >10%.

Conclusion. Among adults with MSSA bacteremia and a self-reported β-lactam allergy, skin testing is cost-effective relative to history screening and routine care at conventional willingness-to-pay thresholds and should be widely adopted given the mortality benefit of β-lactams over alternate antibiotics in MSSA bacteremia.

Table 1: Outcomes.

| Clinical outcomes                  | PCN SkinTested, N = 80 (%) | Untested, N = 80 (%) | Pvalue |
|-----------------------------------|---------------------------|----------------------|--------|
| First-line antibiotics            | 53 (82.8)                 | 31 (57.4)            | 0.003  |
| Clinical cure                     | 58 (95.1)                 | 57 (100)             | 0.48   |
| 90-day recurrence                 | 3 (5.2)                   | 8 (13.3)             | 0.13   |
| C. difficile infection            | 2 (3.1)                   | 4 (6.3)              | 0.40   |
| Allergic reaction                 | 1 (1.5)                   | 0 (0)                | 0.32   |

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1790. Clinical and Economic Outcome Evaluation with Penicillin Skin Testing as an Antimicrobial Stewardship Initiative in a Not-for-Profit Community Health System

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Background. Penicillin skin testing (PST) is a novel way to reduce the use of broad-spectrum agents, potentially resulting in unnecessary overuse and cost savings. This study evaluated clinical and economic outcomes of antimicrobials prescribed with and without PST in a community health system.

Methods. This quasi-experimental study compared an experimental group of 100 adult patients who completed PST for a self-reported penicillin allergy over an open enrollment period beginning January 2016 to a matched control group of 100 patients over the same time frame that had a listed penicillin allergy as well as consultation with infectious diseases. Patients in the control group were matched to the infection diagnosis codes of the members of experimental group and then randomly selected and matched on a 1:1 basis. The primary outcome was β-lactam days of therapy (DOT) defined as either a penicillin or cephalosporin (not carbapenem). The secondary outcome assessed the average cost of antimicrobial therapy before and after PST.

Results. The control group consisted of 436 patients who met inclusion criteria with 100 patients from that group matched to the 100 patients in the PST group by diagnosis code. The most common self-reported allergy consisted of IgE-mediated (52%) and unknown (30%) in the PST group and IgE-mediated (33%), unknown (20%), and rash (12%) in the control group. Ninety-eight of 100 patients who underwent PST tested negative, with 71 out of 98 (73%) having changes directly made to their antibiotic regimen immediately after PST. B-lactam DOT for the control group consisted of 186 out of 984 (19%, 6.5% of patients received a penicillin specifically). Chi-square test of homogeneity for β-lactam DOT between the two groups was significant (P < 0.00001). Changes to the antimicrobial regimen after PST saved the average patient $353.03 compared with no change in pre-PST regimen (P = 0.045).

Conclusion. PST led to immediate antimicrobial de-escalation in the majority of patients who tested negative. This led to a significant increase in β-lactam usage, specifically penicillins. These benefits were also associated with significant cost savings to patients, justifying the cost of performing PST.

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1791. The Impact of a β-Lactam Allergy Assessment on Astreomum Utilization Within a Healthcare System

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Background. Penicillins remain the cornerstone of therapy for methicillin-resistant Staphylococcus aureus (MRSA) infections, but BTS guidelines caution against their routine use in patients in whom β-lactam allergy is likely, even if confirmed. An Antimicrobial Stewardship Initiative in a not-for-profit community health system aimed to offer a more rigorous approach to any prospective β-lactam use following allergy confirmation. This study examined the impact and associated cost savings of this methodology.

Methods. This was a retrospective cohort study comparing a control group of 688 patients admitted from January 2016 to a matched (based on age, gender, diagnosis, and co-morbidities) control group of 688 patients admitted from May 2017 to May 2018. Length of stay, 30-day readmission rate, and cost were compared. HSRI’s Pharmacy-Readmission Prediction Model version 3.0 was used to assess expected 30-day readmission risk.

Results. Of the patients tested, 61% had a confirmed β-lactam allergy and 50% were extrinsically treated. In the extrinsically group (n = 104), only 2% used β-lactams compared to 11% in the untested group (P = 0.03). Although the average cost of antimicrobial therapy was significantly reduced, $1043.85 vs. $1143.39, this was not statistically significant (P = 0.63).

Conclusion. This study demonstrates the feasibility of a more rigorous and clinically sound approach to allergy confirmation and utilization of β-lactams in selected patients. We recommend the adoption of similar strategies in other settings to optimize antimicrobial stewardship and containment of antibiotic resistance.

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