

## Background

- Although penicillin allergy is commonly reported, less than 1% of the population are truly allergic to penicillin. False penicillin allergy labelling may be associated with suboptimal antibiotic selection, greater costs, and higher prevalence of antibiotic-resistant organisms.

## Objective

- To evaluate outcomes of implementing a pharmacist-led penicillin-allergy screening protocol on the antibiotic prescribing habits and the appropriateness of selecting first line antimicrobial therapy.

## Method

- A retrospective, quasi-experimental study included 97 patients with suspected or confirmed common infections. Data was collected between January 2020 to August 2021 for the pre-protocol implementation group (PPG) and between November 2021 to April 2022 for the post-protocol implementation group (PPI) Adults (> 18 years) with a documented penicillin allergy were included.
- Patients with penicillin allergy were identified and interviewed by our Emergency Department (ED) clinical pharmacists using an evidence-based algorithm. Data were analyzed using two-sample Student's t-test and descriptive statistics.

**Table 1. Baseline Characteristics of Pre-protocol Implementation & Post-protocol Implementation Groups**

	Pre-protocol implementation group (PPG) (N=51) Mean ± SD or n (%)	Post-protocol implementation group (PPI) (N=46) Mean ± SD or n (%)	P value
<b>Age</b>	62.9 ± 17.63	53.26 ± 16.65	0.0035
<b>Female gender</b>	30 (58.8)	27 (58.7)	0.9898
<b>History of multiple comorbidities</b>	34 (66.7)	19 (41.3)	0.0139
<b>History of previous beta-lactam tolerance</b>	31 (60.8)	22 (47.8)	0.2036
<b>IgE mediated reaction</b>	19 (37.3)	14 (30.4)	0.4807

**Abbreviations: IgE, immunoglobulin E**

**Table 2. Antibiotics Prescribed in the Pre-protocol Implementation and Post-protocol Implementation Groups**

	Pre-protocol implementation group (PPG) (N=51) n (%)	Post-protocol implementation group (PPI) who received antibiotics (N=38) n (%)	P value
<b>Ciprofloxacin</b>	14 (27.5)	7 (18.4)	0.32
<b>Moxifloxacin</b>	9 (17.6)	0 (0)	0.008
<b>Ertapenem</b>	2 (3.9)	1 (2.6)	0.74
<b>Meropenem</b>	4 (7.8)	5 (13.2)	0.41
<b>Cefepime</b>	5 (9.8)	4 (10.5)	0.91
<b>Piperacillin-tazobactam</b>	3 (5.9)	4 (10.5)	0.42
<b>Vancomycin</b>	8 (15.7)	3 (7.9)	0.27
<b>Clindamycin</b>	5 (9.8)	7 (13.2)	0.24
<b>Aztreonam</b>	8 (15.7)	2 (5.3)	0.13

## Results

- Fifty-one patients in PPG and 46 in PPI. In the PPG, 60.8% (31/51) had a history of beta-lactam tolerance and 26% (8/31) tolerated at least a penicillin derivative previously. While, twenty-two patients (47.8%) in the PPI tolerated beta-lactams and 50% (11/22) tolerated at least one penicillin derivative.
- Thirty-eight patients (82.6%) had a documented infection in the PPI and received an antibiotic. The use of Moxifloxacin was significantly lower in the PPI vs the PPG, 0% (0/38) vs 17.6 (9/51) respectively, (P=0.008). However, the use of ciprofloxacin, vancomycin, and aztreonam was lower in the PPI vs the PPG but was not statistically significant.
- Antibiotic therapy appropriateness was higher in the PPI as compared to the PPG, 86.8% (33/38) vs 49% (25/51) respectively, (P=0.0004). In the PPI, documented penicillin allergies were delabeled in 23.9% (11/46) of patients.

## Conclusion

- We observed higher rates of appropriate first line antibiotic therapy selection post-implementation of the pharmacist led penicillin allergy screening protocol. This could be an effective strategy to optimize antimicrobial therapy in the hospital setting.