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Title
Evaluation of a penicillin allergy pharmacy assessment on non-preferred antimicrobial use in a community hospital

Purpose
In order to improve patient outcomes, promote antibiotic stewardship, and reduce the risk of antimicrobial resistance, reported penicillin allergies need to be assessed in order to determine their clinical significance in guiding antibiotic therapy. Historically, Olathe Medical Center and Miami County Medical Center have assessed patient allergies upon admission. While the process determined what a patient's medication allergy was, it did not always provide details that effectively provided direction for guideline-directed therapy. The purpose of this study was to compare the number of patients that received preferred and non-preferred antibiotic therapy with a reported penicillin allergy.

Methods
This quasi-experimental comparison analysis, utilized a pre-implementation versus post-implementation intervention. The pre-implementation period ranged from December 1, 2019 to February 29, 2020. Patients were included if they had a listed penicillin allergy and were on non-preferred therapy, including: vancomycin, clindamycin, fluoroquinolones and other non-beta lactam antibiotics. The post-implementation period ranged from December 1, 2020 to February 28, 2021. The intervention was a pharmacist's clinical assessment of a patient's penicillin allergy using an electronic clinical tool. An alert would fire for patients on non-preferred therapy with a listed beta-lactam allergy. The pharmacist would then assess the allergy to determine if therapy was appropriate or could be changed. The primary endpoint was the number of patients having received preferred and non-preferred antibiotic therapy with a reported penicillin allergy. Secondary endpoints included the number of clinically non-relevant allergies documented, use of alternative therapies and cost. This data was analyzed using a Chi-squared test.

Results
For the primary endpoint, statistical significance was seen between the pre-implementation and post-implementation of the beta-lactam allergy assessment by pharmacy with a p-value of 0.0029. Of 181 subjects in the pre-implementation group, 71 were on preferred therapy, 80 on non-preferred therapy and 30 were unable to be assessed for appropriateness of therapy. Of the 169 in the post-implementation group, 133 were on preferred, 29 on non-preferred and 7 were unable to be assessed. Regarding secondary endpoints, 82% of post-implementation patient reported beta-lactam allergies were clinically non-relevant. Days of therapy trends indicate a decrease in the use of clindamycin, ertapenem and fluoroquinolones between the two periods. The cost per adjusted patient days indicated a reduction anywhere from 400 to 1,100 dollars.

Conclusion
The implementation of a pharmacy-driven beta-lactam allergy assessment showed statistical significance. This is supported by the current literature and helps promote the proper assessment of medication allergies in a patient's medication history. The appropriate assessment of antibiotic allergies leads to guideline-directed therapy changes, reducing both the risk of serious infections and costs.