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BACKGROUND

- True IgE-mediated reactions to penicillin are uncommon among inpatients.
- Those at high risk of a true penicillin reaction experience anaphylaxis, positive skin testing, recurrent reactions, and reactions to multiple beta-lactam antibiotics.
- A change from guideline-directed therapy due to reported beta-lactam allergies to non-preferred agents may lead to increased risk of *Clostridioides difficile*, methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant *Enterococcus* (VRE).
- Non-preferred agents include: aminoglycosides, carbapenems, daptomycin, fluoroquinolones, linezolid, and vancomycin.
- Evidence supports evaluation of reported allergies to impact guideline-directed therapy.

OBJECTIVES

- Evaluate the reliability of documented penicillin allergies in the community hospital setting
- Optimize antimicrobial use by limiting non-preferred agents in patients with a documented penicillin allergy
- Determine areas for improvement utilizing a pre- and post-implementation technique

METHODS

- Quasi-experimental

| Pre-Implementation | Post-Implementation |
|---|---|
| <ul style="list-style-type: none"> • December 1, 2019 – February 29, 2020 • n = 181 | <ul style="list-style-type: none"> • December 1, 2020 – February 28, 2021 • n = 169 |

- **Implementation:** Vigilanz[®] alert for pharmacy assessment fired for patients with a listed beta-lactam allergy and who were on non-preferred therapy

| Inclusion Criteria | Exclusion Criteria |
|---|---|
| <ul style="list-style-type: none"> • ≥18 years of age with a documented penicillin allergy • Individuals receiving non-preferred antibiotic therapy • Inpatient units at Olathe Medical Center and Miami County Medical Center, including procedural areas | <ul style="list-style-type: none"> • Olathe Health clinics |

- **Primary Endpoint:** number of patients having received preferred and non-preferred antibiotic therapy with a reported beta-lactam allergy
- **Secondary Endpoints:** number of clinically non-relevant beta-lactam allergies documented; assess use alternative therapies; assess cost of non-preferred therapies
- Statistical analysis: chi-squared analysis

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Disclosure: Nothing to Disclose

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RESULTS

Demographics

| Table 1. | Pre-Implementation | Post-Implementation |
|-------------------------------|---------------------------------|---------------------------------|
| Average Age (years) | 55 | 66 |
| Male (%) | 35% | 33% |
| Average Weight (kg) | 93 | 86 |
| Average Length of Stay (days) | 4.44 | 6.50 |
| Top Indication | Prophylaxis - surgery/procedure | Prophylaxis - surgery/procedure |
| Second Indication | Pneumonia | Pneumonia |
| Third Indication | Skin or soft tissue infection | Skin or soft tissue infection |
| Infectious Disease Consults | 20 | 52 |

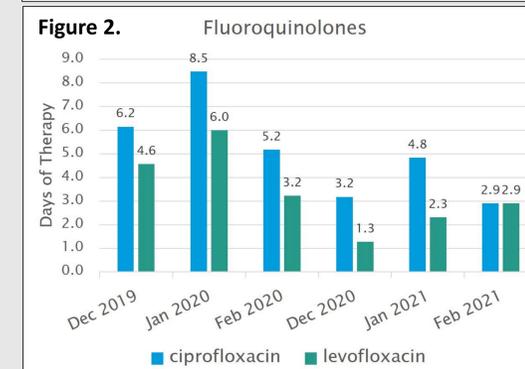
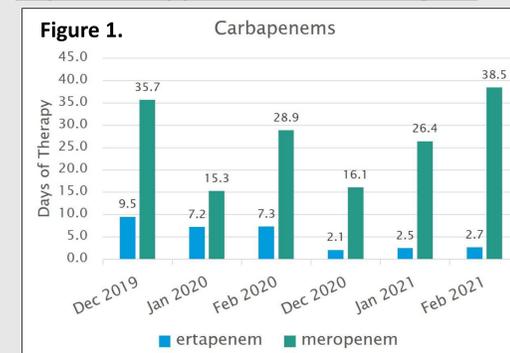
Primary Endpoint

| Table 2. | Pre-Implementation | Post-Implementation |
|----------------------------------|--------------------|---------------------|
| Preferred Therapy | 71 | 133 |
| Non-Preferred Therapy | 80 | 29 |
| Unable to Assess Appropriateness | 30 | 7 |
| Totals (n) | 181 | 169 |

Secondary Endpoints

- 82% of post-implementation patients reported beta-lactam allergies that were clinically non-relevant
- Only 3% of beta-lactam allergies reported as anaphylactic between pre- and post- data sets
- Pharmacy alert documentation indicated 18 of 169 chart allergies were updated by pharmacy while 87% were marked as “accepted”

Days of Therapy for Non-Preferred Agents



- Primarily female
- Indications ranked the same across periods
- Slight deviations in length of stay and Infectious Disease consults

- Statistical significance seen with implementation of pharmacy beta-lactam implementation assessment
- **p-value = 0.0029**
- “Unable to Assess Appropriateness” is excluded from statistical analysis

- Days of therapy analyzed for all non-preferred therapies
- Favorable trends for both ertapenem and fluoroquinolones

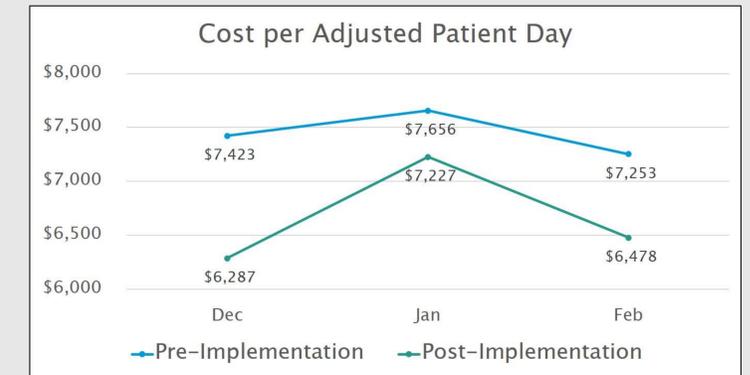
Non-Preferred Agents:

- Gram Positive
- Clindamycin
 - Daptomycin
 - Linezolid
 - Vancomycin

- Gram Negatives
- Aztreonam
 - Ciprofloxacin
 - Levofloxacin
 - Ertapenem
 - Meropenem
 - Gentamicin
 - Tobramycin

RESULTS

Figure 3.



- Cost reduction seen between guideline-directed therapy pre- versus post-implementation

CONCLUSIONS

- A statistically significant difference was found after the implementation of a pharmacy-driven beta-lactam allergy assessment
- Literature supports these findings
- Appropriately assessing antibiotic allergies leads to guideline-directed therapy changes
- Days of non-preferred therapy can be limited, reducing likelihood of more severe infections
- Reduced costs are favorable with guideline-directed therapy

LIMITATIONS

- Lack of direct interaction with patients for assessment
- Post-implementation data set heavy with Infectious Diseases consults
- Census and disease state differences from COVID-19 may contribute to change in prescribing patterns

FUTURE CONSIDERATIONS

- Update allergies with “reaction symptoms” since this field is viewable to providers
- Implement a standardized allergy assessment at admission for pharmacy/nursing at Olathe Health
- Determine appropriateness of allergy skin testing in a community hospital
- Disseminate educational materials to interdisciplinary teams to promote antimicrobial stewardship

References

1. Shenoy ES, Macy E, Rowe TR, et al. Evaluation and Management of Penicillin Allergy. JAMA. 2019;321(2):188-199. doi:10.1001/jama.2018.19283
2. Hunt KV, Harding AM, Taylor SE, Curtain C. Evaluation of medication dose omissions amongst inpatients in a hospital using an electronic Medication Management System. Journal of Evaluation in Clinical Practice. 2018;24(4):688-694. doi:10.1111/jep.12944.
3. Hunt KV, Harding AM, Taylor SE, Curtain C. Evaluation of medication dose omissions amongst inpatients in a hospital using an electronic Medication Management System. Journal of Evaluation in Clinical Practice. 2018;24(4):688-694. doi:10.1111/jep.12944.