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Evaluation of beta-lactam allergy classification and carbapenem use in patients admitted to the medical-surgical floors of a large, community hospital

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**BACKGROUND AND OBJECTIVE**

**Background**
- CDC reports half of patients admitted to the hospital received at least 1 dose of antibiotics from 2006-2012
- Approximately 32 million people in the United States have a documented allergy to a beta-lactam (BL) antibiotic
- Approximately 10% of all US patients report having an allergic reaction to a BL in their lifetime
- Fewer than 1% has a true IgE (immunoglobulin E) mediated allergy to a BL
- Over 80% of those patients with an IgE-mediated allergy lose sensitivity after 10 years
- Penicillin-skin testing cost: ~$220
- Per the CDC, carbapenem use increased by 37% from 2006-2012
- Carbapenems are rarely first line antibiotics, but are frequently used when first line agents are excluded due to the patient’s drug-allergies
- Carbapenem use is associated with increased healthcare costs and promotion of antibiotic resistance

**Objective**
- Determine the beta-lactam (BL) allergy-risk stratification for patients at Parkview Regional Medical Center with a documented allergy to a BL

**DESIGN AND METHODS**

**Design**
- Observational, retrospective cohort study of patients with BL allergies to evaluate the EMR determined risk level stratification of their allergy to a BL and the correlations with carbapenem antibiotic use within 24 hours of admission
- Parkview Health IRB approved this quality improvement project

**Methods**
- Data was collected on any patient admitted to the general medical floors at Parkview Regional Medical Center between August 3rd, 2020 and October 23rd, 2020
- We identified 235 unique documented beta lactam allergies of 197 hospitalized patients
- Data collected included
  - Age
  - BL allergy and reaction type
  - Non-BL antibiotic allergies
  - Allergy-risk stratification (EMR)
  - Allergy-risk stratification (JAMA article)
  - BL antibiotics received within 24 hours of current admission
  - BL antibiotics received on previous admissions and in the outpatient setting
  - At minimum of one attempt for an interview via telephone was made for all patients

**RESULTS**

- **Figure 1. Beta-lactam allergy-risk stratification**
  - Low risk = 19.3%
  - Medium risk = 32.7%
  - High risk = 79.9%

- **Table 1. Patient characteristics**

**DISCUSSION AND CONCLUSION**

**Discussion**
- Out of 235 unique beta lactam allergies identified, 192 (81.7%) of the allergies had severity classifications of “not-specified” in the Parkview EMR
- 38 out of 197 (19.3%) patients had allergies to beta-lactam antibiotics with the reaction type of “unknown,” making it harder to accurately stratify these patients by reaction type
- For patients who received a beta-lactam within the first 24 hours of their current admission, the likelihood the beta-lactam received was a carbapenem are as follows:
  - High risk = 79.9%
  - Medium risk = 32.7%
  - Low risk = 19.3%

**Limitations**
- Retrospective cohort study
- Data collection via chart review
- No in-person interviewing due to the COVID-19 pandemic, only telephone-based interviewing permitted (67.5% of patients reached via telephone)

**Future Directions**
- Study results will facilitate change in the Parkview Health System regarding allergy classification, allergy risk stratification, and prescribing habits

**REFERENCES**


**AUTHOR DISCLOSURES**

Authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.