Evaluation of acute kidney injury with vancomycin therapy in adult

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**OBJECTIVE**
To evaluate the outcomes and risk of acute kidney injury (AKI) associated with a pharmacy-driven vancomycin dosing protocol at a community hospital.

**BACKGROUND**

- Nephrotoxicity related to vancomycin use is estimated to occur in 5-7% of patients.1,2
- AKI was defined for this study using KDIGO criteria: a 50% rise in serum creatinine (SCr) within 7 days from baseline.1
- AKI can occur through many different exposures including sepsis, hydration status, comorbid conditions, and concomitant nephrotoxic medications.1
- Vancomycin is a known nephrotoxic medication (NTM) but the risk of AKI increases when combined with other nephrotoxic exposures.1
- In order to determine the risk of AKI associated with the pharmacy-driven vancomycin protocol, a detailed evaluation of both vancomycin treatment and other AKI exposures was conducted.

**METHODS**

- Clinical information pertaining to patients receiving vancomycin & additional encounter information was extracted from a relational database that is supported by the electronic medical record.
- Queries to this database included:
  - Patient identifiers and demographics
  - Vancomycin order details
  - Pertinent laboratory values
  - Concomitant nephrotoxic agents*

- This information was the basis for a focused critical evaluation through manual data collection including:
  - Preliminary indication
  - Trough goals
  - Evaluation of hydration status
  - Pre-existing conditions, such as chronic kidney disease (CKD)
  - Culture data
  - Duration of acute kidney injury

**RESULTS**

- Table 1: Results from collected data

**CONCLUSIONS**

- Overall, the vancomycin-related AKI rate is similar to published rates.
- When AKI occurs, it is most likely to occur in first 4 days of therapy.
- 96.3% of patients receiving vancomycin experiencing AKI also received concomitant nephrotoxic agents.
- The majority of patients experiencing AKI have a goal trough range of 15-20 mcg/mL.
- As BMI increases in patients with AKI, the potential for initial trough > 20 mcg/mL also increases.

**OPPORTUNITIES**

- More frequent patient monitoring in the first 4 days of therapy
- Reduced dosing in obese patients*
- Reduced dosing in patients with concomitant nephrotoxic agents*
- Re-evaluation of loading dose*
- Assessment of indications requiring higher trough range goals*

*Pending data collection and analysis of patients without AKI

**NEXT STEPS**

- Collect and analyze data for matched patients without AKI
- Update dosing protocol with monitoring requirements for initial 4 days of therapy
- Investigate and update initial and maintenance dosing changes for patients with BMI > 30
- Complete comparison for differences between AKI and non-AKI groups

**REFERENCES**