**Initial empiric treatment of acute pyelonephritis in the emergency department with gentamicin vs ceftriaxone**

**Background:** *Escherichia coli* (*E. coli*) is the predominant pathogen in acute pyelonephritis, accounting for approximately 90% of cases. The increasing rates of resistance of *E. coli* to guideline recommended agents presents a significant challenge to clinicians when selecting empiric treatment for pyelonephritis. Aminoglycosides (AG) have favorable activity against uropathogens, penetrate renal tissue, and achieve high concentrations in the urine. These characteristics make AG a potential treatment option for the management of pyelonephritis, however the adverse effects of nephrotoxicity and ototoxicity have limited the class’s use in practice. The purpose of this study is to evaluate the efficacy and safety of gentamicin, as compared to ceftriaxone, in the initial empiric treatment of acute pyelonephritis among University of New Mexico Hospitals (UNMH) Emergency Department (ED) patients.

**Methods:** This is a retrospective chart review of adult patients seen in the UNMH ED from 1 January 2020 to 31 December 2021 with a primary diagnosis of acute pyelonephritis. Patients are included if they received at least one dose of empiric treatment with gentamicin or ceftriaxone and were discharged home with a 6 to 15-day course of cephalexin. Exclusion criteria are hospital admission, pregnancy, history of renal transplant, bacteremia, suspected or confirmed acute or chronic infection outside of the kidneys, concurrent antibiotic use with gentamicin, ceftriaxone, or cephalexin, and renal or urinary tract surgery within the past 30 days of ED presentation. The primary outcome is rate of clinical failure which is defined as a documented change in antibiotic therapy based on culture results and susceptibilities resistant to gentamicin, ceftriaxone, or cephalexin or a return visit to the ED, urgent care, or UNMH clinic within 30 days for non-resolving or worsening fever, leukocytosis, or flank pain. Secondary outcomes include rate of microbiological failure, rate of treatment-related adverse events, and length of stay in the ED. Statistical analysis will be performed using SPSS software. Baseline categorical variables and the primary outcome will be compared using a Chi Square test. Continuous baseline variables will be compared using a 2-tailed independent sample t test. Statistical significance is defined as p <0.05. Univariate logistic regression will be used to assess confounding variables.

**Results**

In Progress

**Conclusions**n/a