

Treatment duration of Enterobacterales bacteremia

Purpose:

Bloodstream infections caused by gram-negative bacteria are a common and deadly occurrence. Current guidelines do not specify the treatment duration of gram-negative bacteremias. As a result, treatment durations range from 7 to 14 days or longer. Multiple studies have reported that shorter treatment durations reduce the risk of adverse reactions, *Clostridioides difficile* infections, antimicrobial resistance, and medication costs. The purpose of this study is to determine if short duration antibiotics are as effective as long duration antibiotics in achieving clinical cure of uncomplicated Enterobacterales bacteremias.

Methods:

This non-inferiority retrospective cohort study was approved by the Institutional Review Board. This study included adult patients hospitalized with Enterobacterales bacteremia identified by a positive blood culture for *Citrobacter*, *Enterobacter*, *Escherichia*, *Klebsiella*, *Proteus* or *Serratia* species. The control group consisted of patients who were treated with antimicrobials for a long duration of more than 10 days. The treatment group included patients treated for a short duration of 10 days or less. The primary outcome was a composite of clinical cure, defined as a lack of bacteremia recurrence within 90 days and having two of the following during antimicrobial treatment: lack of persistent bacteremia, resolution of an abnormal temperature, or resolution of an abnormal white blood cell count. Secondary outcomes included rates of resistance and readmission within 90 days of treatment completion, hospital length of stay in days, and the rates of occurrence of adverse events including acute kidney injury and *C. difficile* infections. It was hypothesized that using short duration antibiotics to treat uncomplicated Enterobacterales bacteremia would not result in worse rates of clinical cure as compared to long duration antibiotics.

Results:

We included 409 patients with 74 in the treatment group and 335 in control. The primary source of infection was UTI and the most common bacteria isolated was *E.coli* in both groups. The primary outcome occurred in 73 patients (99%) in the short duration group and 325 patients (97%) in the long duration group. Short duration antibiotics were not found to be non-inferior to long duration antibiotics. However, when looking at the individual components of the primary outcome, there were no significant differences. There were no significant differences in the rates of antimicrobial resistance and readmission, rates of occurrence of antimicrobial adverse effects, and hospital length of stay.

Conclusions:

There was no significant difference in the primary outcome of clinical cure likely due to the small sample size in the short duration. Based on the information gathered in this study and previous studies looking at similar populations and durations, it is appropriate to recommend shorter antimicrobial treatment durations in select patients with uncomplicated Enterobacterales bacteremias.