

SUMMARY OF RESULTS



SHREC

Antibacterial Resistance Leadership Group

The Antibacterial Resistance Leadership Group (ARLG) funds, designs, and conducts clinical research that will help prevent, diagnose, and treat infections caused by bacteria that are resistant to antibiotics.

The ARLG, along with the team of study doctors, scientists, and researchers, are pleased to describe the results from a study focused on antibiotic review strategies in community hospitals to prevent overuse of antibiotics.

WHAT IS THE STUDY TITLE?

Clinical Impact of Ceftriaxone Resistance in *Escherichia coli* Bloodstream Infections:
A Multicenter Prospective Cohort Study



WHAT IS THE PURPOSE OF THE RESEARCH? WHAT IS THE PRIMARY ENDPOINT?

The purpose of this study was to compare the clinical outcomes of two groups of patients with infections in their blood from a bacterium called *Escherichia coli* or *E. coli* for short. The two groups included patients who either had a type of *E. coli* that responded to an antibiotic called ceftriaxone or a type of *E. coli* that was resistant to treatment with ceftriaxone. Patients in the latter group received antibiotics other than ceftriaxone to treat their infection.

Clinical outcomes were described using a method called Desirability of Outcome Ranking (DOOR), where outcomes ranged from alive with no events (such as remaining in or readmission to the hospital) to death within 30 days after diagnosis.

The main objective of the study was to compare the clinical outcomes of both groups of patients 30 days after being diagnosed with *E. coli* infection based on the DOOR ranking.



WHY IS THIS RESEARCH IMPORTANT TO PATIENTS, CLINICIANS, AND OTHER RESEARCHERS?

It's important to find out whether *E. coli* infections of the bloodstream that do not respond to ceftriaxone unfavorably affect a patient's outcomes.



WHY WAS THIS RESEARCH CONDUCTED? WHAT IS THE RATIONALE?

E. coli infections are one of the most common types of bacterial infections found in the bloodstream. Ceftriaxone is used to treat many kinds of bacterial infections, including *E. coli* infections in the blood. However, there is a growing number of *E. coli* infections in the blood that are resistant to ceftriaxone in the United States.

Studies looking at the clinical outcomes of patients with *E. coli* infections in the blood have shown that patients with infections that do not respond to treatment with ceftriaxone do worse than those with infections that do respond. It isn't clear, though, if those worse outcomes are related to other factors like delays in treatment and problems with the immune system. Therefore, a prospective study was designed that accounted for other possible contributing factors.



MANUSCRIPT OF PRIMARY RESULTS

<https://pubmed.ncbi.nlm.nih.gov/36381622/>



WHEN DID THE RESEARCH TAKE PLACE?

Between November 12, 2020
and April 28, 2021



ARLG

Antibacterial Resistance Leadership Group



WHO WAS INVOLVED?

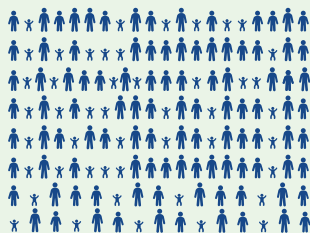
The study included 300 adult and pediatric participants with an *E. coli* infection in their bloodstream at 14 hospitals across the United States. Half of the participants were diagnosed with ceftriaxone-resistant *E. coli* and half with *E. coli* that did respond to ceftriaxone.

300

Adult and pediatric participants with an *E. coli* infection in their bloodstream



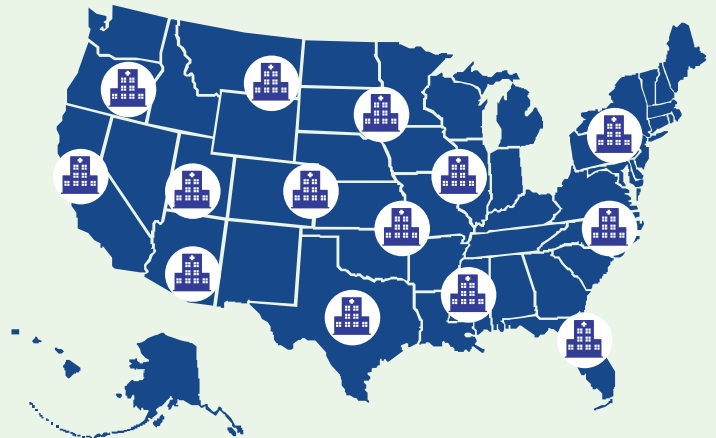
Half of the participants diagnosed with ceftriaxone-resistant *E. coli*



Half of the participants with *E. coli* that did respond to ceftriaxone

14

Hospitals across the United States



WHAT HAPPENED DURING THE STUDY?

In this study, researchers collected information about participants from their electronic health records. They also sent samples to a central laboratory to confirm the type of bacteria found in the bloodstream by the local hospital.



HOW WILL THE RESULTS HELP PATIENTS AND DOCTORS?

Findings from this study highlight the need to be thoughtful about antibiotic use, so development of antibiotic-resistant types of bacteria and the associated negative outcomes can be reduced.

IS THE STUDY REGISTERED WITH CLINICALTRIALS.ORG?

Yes. NCT04574596



WHAT WERE THE RESULTS?

The study showed that, overall, participants with ceftriaxone-resistant *E. coli* had worse clinical outcomes than participants with ceftriaxone-susceptible *E. coli*. Participants with ceftriaxone-resistant *E. coli* were also less healthy as a group to begin with, and this was thought to be the main explanation for the worse outcomes that were seen, rather than a direct effect of the infection with more resistant bacteria.

Participants with ceftriaxone-resistant *E. coli* were more likely to have prolonged stays in the hospital, to be more likely to remain in the hospital 30 days after diagnosis, and to have a new need for transfer to a long-term care facility from the hospital. These findings indicate that being infected with a ceftriaxone-resistant *E. coli* may impact quality of life more so than infection with *E. coli* that responds to treatment with ceftriaxone.



WHAT'S NEXT?

More research is needed with a larger group of patients diagnosed with *E. coli* infections where outside contributing factors are limited, so scientists can better understand the role that antibiotic resistance plays in patient outcomes and quality of life.