CRE infection rate rising in young children

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Children are becoming infected with the highly fatal antibiotic resistant bacteria CRE at a much higher rate than the recent past, according to a data analysis by researchers at Rush University Medical Center. The study was published in the Centers for Disease Control's publication *Emerging Infectious Diseases* on Oct. 14.

CRE stands for Carbapenem-resistant Enterobacteriaceae, a type of bacteria that most often is found in inpatient care settings (i.e., hospitals and long term care facilities) and that is resistant against many types of antibiotics. As a result, about half of the patients who become infected with CRE die from it, according to estimates by the U.S. Centers for Disease Control and Prevention.

Although there is a growing amount of data on CRE in adults, there is little data on CRE in children. "There have not previously been any nationwide studies assessing the prevalence and epidemiology of CRE in U.S. children, so to date no one has known whether CRE are a true emerging problem in children," says Latania Logan, MD, the lead author of the study findings and an assistant professor of pediatrics at Rush. The study received support from the National Institute Of Allergy And Infectious Diseases.

Drawing on a nationwide data base of reports from 300 microbiology laboratories, the study assessed the presence of CRE bacteria in 316,253 cultures obtained from children in the U.S. from 1999 to 2012. The study found that CRE in children is still relatively uncommon, but that the rate of infection had increased significantly among children of all ages and settings, from 0 percent in 1999-2000 to .47 percent in 2011-2012. The greatest increase, from zero to 4.5 percent, was found in cultures from children between ages 1 through 5 cared for in intensive care units. In addition, CRE isolates found in the bloodstream increased from zero to 3.2 percent during the study period. This is important because according to the CDC, up to half (50 percent) of people who develop CRE bloodstream infection die from the infection.

Most adult CRE cases are found in residents of long-term care facilities, the elderly and the critically ill. While infection among children similarly is higher in intensive care settings as it is in adults, the ways that the bacteria are causing the antibiotic resistance to last line therapy such as the carbapenems may be different.

"This difference would affect how the patients are treated and infections are best prevented. We are looking at these differences currently so that we can figure out the best strategies for prevention," Logan says.

Chicago is the primary region for some of the notoriously drug resistant

forms of CRE, which also are able to travel easily between bacteria and between people. Logan believes more studies are needed to assess the children at highest risk for infection and the ways bacteria become resistant to antibiotics in children.

"It is important to help understand the epidemiology of these organisms and to prevent spread of CRE by alerting hospitals of individuals who previously have been found to carry these germs, which allows the facility receiving the patient to place the individual under appropriate isolation precautions," Logan says. "Novel initiatives such as this as well as antimicrobial stewardship efforts will be critical in reducing spread of these dangerous bacteria."

Provided by Rush University Medical Center