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Among US children, more infections caused by drug-resistant bacteria

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Infections caused by a concerning type of antibiotic-resistant bacteria are on the rise in U.S. children, according to a new study published in the *Journal of the Pediatric Infectious Diseases Society* and available online. Although still uncommon, the bacteria are increasingly found in children of all ages, especially those 1-5 years old, raising concerns about dwindling treatment options.

Researchers led by Latania K. Logan, MD, of Rush University Medical Center in Chicago, analyzed resistance patterns in approximately 370,000 clinical isolates from pediatric patients, collected nationwide between 1999 and 2011. Specifically, they determined the prevalence of a resistant type of Gram-negative bacteria, Enterobacteriaceae, that produces a key enzyme, extended-spectrum beta-lactamase (ESBL). The enzyme thwarts many strong antibiotics. Another indicator of ESBL prevalence, susceptibility to third-generation cephalosporins—an important class of antibiotics used to treat many infections—was also measured.

The prevalence of ESBL-producing bacteria increased from 0.28 percent to 0.92 percent from 1999 to 2011; resistance to third-generation cephalosporins increased from 1.4 percent to 3.0 percent. ESBLs were found in children across the country of all ages, but slightly more than half of the isolates with this resistance were from those 1-5 years old. Nearly three-quarters (74.4 percent) of these bacteria were resistant to multiple classes of antibiotics.

"These antibiotic-resistant bacteria have traditionally been found in health care settings but are increasingly being found in the community, in people who have not had a significant history of health care exposure," Dr. Logan said. "In our study, though previous medical histories of the subjects were unknown, 51.3 percent of the children presented in the outpatient or ambulatory setting."

While the overall rate of these infections in children is still low, ESBL-producing bacteria can spread rapidly and have been linked to longer hospital stays, higher health care costs, and increased mortality, the study authors noted. In a 2013 report, the Centers for Disease Control and Prevention called ESBLs a "serious concern" and a significant threat to public health.

Physicians should obtain cultures for suspected bacterial infections to help determine which antibiotics are best, Dr. Logan said. "Some infections in children that have typically been treated with oral antibiotics in the past may now require hospitalization, treatment with intravenous drugs, or both, as there may not be an oral option available."

More research is needed to define risk factors for these infections in children, their prevalence in different settings, and their molecular epidemiology, Dr. Logan said. A companion study by several of the same researchers, also now available online in the *Journal of the Pediatric Infectious Diseases Society*, suggests that children with neurologic conditions are at higher risk for infections caused by ESBL-producing bacteria.

Additional drug development, keeping younger patients in mind, is also needed. "The overwhelming majority of current research for new pharmaceuticals against antibiotic-resistant organisms are in adults," Dr. Logan said. "New drug options will need to be available for young children."

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