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INTRUÇÕES

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Dangerous New Antibiotic-Resistant Bacteria Reach U.S.: Woman infected with microbes that fight a last-line-of-defense drug; common infections could become untreatable
By Melinda Wenner Moyer for Scientific American, on May 27th, 2016

A dangerous new form of antibiotic resistance has spread to the United States. Researchers at the Department of Defense announced that a Pennsylvania woman developed a urinary tract infection (UTI) with bacteria that fought off an antibiotic of last resort called colistin, and had 15 genes for resistance to other antibiotics. Until now, many bacteria have been vulnerable to colistin, even if they have been able to survive other medications. Since this type of resistance can easily spread within bacteria, the findings have sounded alarm bells among scientists over fears that common infections will soon be untreatable.

Bacteria have exhibited colistin resistance in the past, but this time it is different. Previous forms of the resistance weakened the microbes, and the resistance genes were located on DNA that was not easily shared among bacteria. But Chinese, British and now American researchers discovered that *mcr-1*, a new gene for colistin resistance, was circulating among animals and people housed on circular pieces of bacteria DNA called plasmids. Bacteria carrying plasmids can share copies of them with other bacteria when they come into contact, which allows the colistin resistance to spread widely and rapidly. Because colistin is commonly used in food animals in China, but not in people, “the emergence of *mcr-1* likely occurred because of extensive use of colistin in food animal production—which is yet another example of how injudicious use of antimicrobials comes back to hurt us,” explains James Johnson, an infectious disease specialist at the University of Minnesota.

People may pick up these bacteria in various ways, including from their food. Although the types of *E. coli* that cause UTIs are found within the urinary tract, they typically end up there because they have migrated from the gut. Research suggests that these types of *E. coli* often contaminate raw meat; in 2010 the U.S. National Antimicrobial Resistance Monitoring System reported that more than 75 percent of retail chicken and turkey meat was contaminated with *E. coli* and that many of these bacteria were resistant to multiple antibiotics. The *E. coli* found on poultry meat were of the type that can—if ingested when food is not cooked properly—migrate from the gut and cause serious infections such as UTIs.

Ultimately, the big fear is that the newly discovered *mcr-1* gene will end up being picked up by other multi-drug-resistant bacteria, particularly a kind known as Carbapenem-resistant *Enterobacteriaceae*, or CRE. These microbes are resistant to a class of drugs called carbapenems, which are reserved to treat resistant infections. Infections with CRE are “becoming more and more common,” says Lance Price, a microbiologist who directs the Antibiotic Resistance Action Center at George Washington University—“and right now, colistin is among the only drugs that can cure them. If CRE end up intermingling with bacteria containing the *mcr-1* gene inside a person or animal’s gut, or even on a piece of meat—and this could already be happening unbeknownst to anyone—the world could suddenly be faced with pan-drug-resistant bacteria. Then it’s untreatable”.

“*Escherichia coli* Harboring *mcr-1* and *bla*_{CTX-M} on a Novel IncF Plasmid: First report of *mcr-1* in the USA”
McGann et al. Antimicrob. Agents Chemother. (Online 26 May 2016) doi:10.1128/AAC.01103-16



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