MedicalXpress

When prescribing antibiotics, doctors most often choose strongest types of drugs

August 1 2013

When U.S. physicians prescribe antibiotics, more than 60 percent of the time they choose some of the strongest types of antibiotics, referred to as "broad spectrum," which are capable of killing multiple kinds of bacteria, University of Utah researchers show in a new study.

Unfortunately, in more than 25 percent of such prescriptions are useless because the infection stems from a virus, which cannot be treated with antibiotics. This overuse of antibiotics has a number of downsides, including that these types of drugs kill more of the "good" bacteria found in our bodies – which may lead to more side effects – and also contribute to the growth of antibiotic-resistant bacteria, according to Adam L. Hersh, M.D., Ph.D., an infectious disease expert, assistant professor of pediatrics at the University of Utah School of Medicine and senior author on a study published July 29, 2013, in the *Journal of Antimicrobial Chemotherapy*.

Discerning whether an infection is viral or bacterial can be tricky, according to Hersh, which probably accounts for much of the overuse of antibiotics. "It seems that the natural bias, when there is uncertainty about an infection's cause, is to err on the side of prescribing antibiotics," he says. "Our study found that the majority of prescriptions are for antibiotics that kill a wider range of bacteria, and that they are most likely to be given when they're not needed, such as in cases of viral infections."

The types of illnesses where doctors seem to choose stronger antibiotics

include respiratory problems, skin infections and urinary tract infections, which in many cases would be better treated by other antibiotics that are less likely to cause resistance.

Hersh, Andrew T. Pavia, M.D., also an infectious disease expert and professor of pediatrics at the University of Utah, Lauri A. Hicks, D.O., a medical epidemiologist at the U.S. Centers for Disease Control and Prevention, and University of California, San Francisco, medical student Daniel J. Shapiro, conducted the study using a public database with information on ambulatory care visits at physician offices and hospital-based outpatient and emergency departments nationwide. Studying data from between 2007-2009, they identified a sample of 238,624 visits by patients 18 and older at those medical facilities and found that 61 percent of antibiotic prescriptions were for broad-spectrum drugs, such as Levaquin®. Narrow-spectrum antibiotics, such as amoxicillin and doxycycline, comprised the remaining 39 percent of antibiotic prescriptions.

Based on the sample of 238,000-plus visits, the researchers estimate there was an average of 985 million annual ambulatory care visits for the 2007-2009 period, with antibiotics being prescribed in an estimated 101 million of those visits each year – 62 million in which broad-spectrum antibiotics were prescribed and 39 million that resulted in narrow-spectrum antibiotics prescriptions.

While this study looked only at adult ambulatory care visits, the prescription pattern for children is similar, according to Hersh. "Many antibiotics prescribed for children are unnecessary, particularly for conditions caused by viruses, where antibiotics don't help at all," he says. "Even when an antibiotic is indicated, such as for strep throat or some ear infection, physicians often prescribe and antibiotic such as a Z-Pak, which can be less effective than amoxicillin."

Hicks emphasizes that antibiotic overuse among children and adults is a serious problem and a threat to everyone's health. "The biggest problem with using antibiotics when they're not needed is the development of antibiotic resistance, which is when bacteria survive by outsmarting the antibiotic," she says. "Common infections become difficult to treat, and when you really need an antibiotic, it may not work."

Uncertainty about the cause of an infection is one factor in the overuse of broad-spectrum antibiotics, but there are other influences too, according to Hersh. This includes a misperception by physicians that their patients expect an antibiotic if they take the time to see the doctor. But Hersh believes this second factor is changing, due in part to major efforts to educate people about the problems associated with overuse of antibiotics, such as CDC's "Get Smart: Know When Antibiotics Work" program.

"The public is increasingly aware of the downside and side effects of antibiotics," Hersh says. "Actually, when they see their doctor, most patients just want an explanation as to what's wrong and are open to considering why an antibiotic wouldn't be helpful."

He urges patients to play a larger role by asking their doctor two questions: Do I really need this antibiotic? And, is this antibiotic the best choice for my infection?

"Both doctors and patients have a role in ensuring the effectiveness of antibiotics is preserved by using them only when needed," Pavia says.

Provided by University of Utah Health Sciences

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