UCSF studies examine antibiotic prescribing patterns for children

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Two new studies led by researchers at the University of California, San Francisco have found some antibiotics may be overused for children with asthma and urinary tract infections.

The findings raise concerns around breeding drug resistance in children and underscore the need for pediatricians to take a more prudent approach when prescribing antibiotic medications. In the case of asthma, the findings have led to a new trial, in which the value of targeted antibiotics is being tested.

Both studies are published in the June issue of the journal *Pediatrics* and now are available online at pediatrics.aappublications.org.

"It is critical for pediatricians to promote the judicious use of antibiotics," said Michael Cabana, MD, MPH, senior author of the asthma study and chief of general pediatrics at UCSF Benioff Children's Hospital.

Nearly 9 million children in the United States have asthma, a chronic respiratory condition that causes the lung's airways to swell and narrow, according to the National Institutes of Health. While certain medications do help prevent asthma attacks and control ongoing symptoms, national health guidelines do not currently recommend antibiotics as an asthma therapy.

Cabana, along with first author Ian Paul, MD, MSc, of the Penn State

College of Medicine, and colleagues examined data from two nationally representative surveys that track visits to doctors' offices and emergency departments throughout the country. They assessed how frequently antibiotics were prescribed to children younger than 18 who were seen for asthma-specific complaints from 1998 to 2007.

Of the 5,198 outpatient visits included in the analysis, antibiotics were prescribed during nearly one in six visits. The researchers estimate that this equates to about 1 million antibiotic prescriptions for kids with asthma in the United States each year.

The study also indicated that when pediatricians discussed best practices for treating asthma and preventing attacks during office visits, patients were less likely to receive antibiotic prescriptions. As a next step, the researchers emphasize the importance of encouraging more doctors to take the time to educate their patients about asthma in order to eliminate unwarranted prescriptions.

Additionally, researchers need to systematically examine whether antibiotics have any positive impact on asthma symptoms, so national guidelines can be adjusted, if necessary. According to Cabana, there are anecdotal reports suggesting that some antibiotics – particularly a group of drugs called macrolides – may help reduce asthma-related inflammation. UCSF has been designated one of nine participating centers in a recently launched NIH-sponsored trial that will test whether antibiotics are effective in children with asthma.

"This study is a great example of how we have to constantly examine and question what we do, so we can develop valuable studies that will help us continue to improve the therapies we can offer to kids," Cabana added. "Just because something does not fall within today's guidelines doesn't mean we should automatically dismiss it as being potentially helpful."

In the second study, lead UCSF author Hillary Copp, MD, MS, and colleagues investigated patterns of antibiotic use for pediatric urinary tract infections (UTIs) using the same national survey data from 1998 to 2007. On average, urinary tract infections account for at least 1.5 million outpatient visits by children each year in the United States.

The study focused on prescriptions of broad-spectrum antibiotics, which act against a wide range of disease-causing bacteria. Narrow-spectrum antibiotics, in contrast, are effective against more specific families of bacteria, and cause less bacterial resistance since they are more targeted.

Based on the 1,828 doctor visits for pediatric urinary tract infections captured in the analysis, the researchers found that antibiotics were prescribed during 70 percent of the visits, and broad-spectrum antibiotics were the prescription of choice one-third of the time. Moreover, the use of a specific class of broad-spectrum antibiotics, called third-generation cephalosporins, doubled during the study period. Given that narrower-spectrum alternatives often are just as effective against infections, the findings imply that efforts are needed to educate physicians in order to promote more appropriate drug selection, explained Copp.

"It is always concerning when we see a rise in a particular antibiotic class, as this can create drug resistance through antibiotic selection pressures," said Copp, who is an assistant professor of pediatric urology at UCSF. "It is okay to prescribe broad-spectrum antibiotics if a doctor thinks the clinical scenario warrants it. However, when this is done, a urine sample should be obtained so therapy can be tailored accordingly and patients can transition to a more narrow-spectrum drug based on the urine culture results."

Provided by University of California, San Francisco