Intervention improves adherence to antibiotic prescribing guidelines for children

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An intervention consisting of clinician education coupled with personalized audit and feedback about antibiotic prescribing improved adherence to prescribing guidelines for common pediatric bacterial acute respiratory tract infections, although the intervention did not affect antibiotic prescribing for viral infections, according to a study in the June 12 issue of *JAMA*.

"Antibiotics are the most common prescription drugs given to children. Although hospitalized children frequently receive antibiotics, the vast majority of antibiotic use occurs in the outpatient setting, roughly 75 percent of which is for acute respiratory tract infections (ARTIs). Unnecessary prescribing for viral ARTIs is well documented and has been declining. However, inappropriate prescribing also occurs for bacterial ARTIs, particularly when broad-spectrum antibiotics are used to treat infections for which narrow-spectrum antibiotics are indicated and recommended," according to background information in the article. "Antimicrobial stewardship programs have been effective for inpatients, often through prescribing audit and feedback. However, most antimicrobial use occurs in outpatients with acute respiratory tract infections.

Jeffrey S. Gerber, M.D., Ph.D., of The Children's Hospital of Philadelphia, and colleagues conducted a study to evaluate the effect of an antimicrobial stewardship intervention on antibiotic prescribing for pediatric outpatients. The randomized trial of outpatient antimicrobial stewardship compared prescribing between intervention and control

practices using a common electronic health record. After excluding children with chronic medical conditions, antibiotic allergies, and prior antibiotic use, the researchers estimated prescribing rates for targeted ARTIs standardized for age, sex, race, and insurance from 20 months before the intervention to 12 months afterward (October 2008-June 2011). The study included a network of 18 pediatric primary care practices in Pennsylvania and New Jersey (162 clinicians). Overall, there were 1,291,824 office visits by 185,212 unique patients.

The intervention consisted of one 1-hour on-site clinician education session followed by 1 year of personalized, quarterly audit and feedback of prescribing for bacterial and viral ARTIs or usual practice. The researchers measured rates of broad-spectrum (off-guideline) antibiotic prescribing for bacterial ARTIs and antibiotics for viral ARTIs for 1 year after the intervention.

The authors found that among children who were prescribed antibiotics for any indication, the overall proportion of antibiotic prescriptions that were broad-spectrum decreased from 26.8 percent to 14.3 percent in the intervention group and from 28.4 percent to 22.6 percent in control practices (difference of differences [DOD], 6.7 percent) during the 12-months following initiation of education/audit and feedback.

"When stratifying by the individual bacterial ARTIs targeted by the intervention, broad-spectrum (off-guideline) antibiotic prescribing for pneumonia decreased from 15.7 percent to 4.2 percent in the intervention group and from 17.1 percent to 16.3 percent in the control group (DOD, 10.7 percent). Broad-spectrum prescribing for acute sinusitis decreased from 38.9 percent to 18.8 percent in the intervention group and from 40.0 percent to 33.9 percent in the control practices (DOD, 14.0 percent). Broad-spectrum prescribing for streptococcal pharyngitis started and remained low for both the intervention group (from 4.4 percent to 3.4 percent) and the control group (from 5.6

percent to 3.5 percent) (DOD, -1.1 percent)," they write.

In addition, the baseline rate of any antibiotic prescribing for viral infections was low and did not change significantly after the intervention in either the intervention group (from 7.9 percent to 7.7 percent) or the control group (from 6.4 percent to 4.5 percent) (DOD, -1.7 percent).

"This intervention nearly halved prescribing of broad-spectrum antibiotics to children during acute primary care encounters and decreased use of off-guideline antibiotics for children with pneumonia by 75 percent by 1 year after the intervention," the researchers note.

"Our findings suggest that extending antimicrobial stewardship to the ambulatory setting, where such programs have generally not been implemented, may have important health benefits."

"This targeted application of antimicrobial stewardship principles to the ambulatory setting has the potential to affect the most common indications for antibiotic use. Future studies should examine the key drivers of these effects on antibiotic prescribing and the generalizability of findings to other health systems and measure the sustainability and clinical outcomes associated with differential prescribing patterns," the authors conclude.

"Gerber et al and the participating practices and clinicians have accomplished meaningful improvement in antibiotic prescribing for ARTIs in their pediatric patients," writes Jonathan A. Finkelstein, M.D., M.P.H., of Boston Children's Hospital and Harvard Medical School, Boston, in an accompanying editorial.

"However, broad-spectrum antibiotic overuse continues in humans across age groups and conditions, as well as in agricultural use and other factors that drive emerging resistance. The good news is that a range of

effective techniques for promoting judicious prescribing in ambulatory care have been developed and tested; it is also apparent that the influence and benefit of any of these interventions will vary greatly across settings. Tailoring strategies to contextual factors and adapting them further during implementation may well be more effective than merely rolling out the approach with the greatest average effect in the average practice."

More information: *JAMA*. 2013;309(22):2345-2352
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