

Antibiotic exposure could increase the risk of juvenile arthritis

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Taking antibiotics may increase the risk that a child will develop juvenile arthritis, according to a study from Rutgers University, University of Pennsylvania and Nemours A.I. duPont Hospital for Children published today in *Pediatrics*.

Researchers found that children who were prescribed [antibiotics](#) had twice the risk of developing [juvenile arthritis](#) compared to children the same age who were not prescribed antibiotics. The more courses of antibiotics prescribed, the higher the associated risk, they found. The risk was strongest within one year of receiving antibiotics.

Between 4,300 and 9,700 children under the age of 16 are diagnosed with juvenile arthritis a year, according to the latest Centers for Disease Control and Prevention statistics. Juvenile arthritis, a form of autoimmune disease, involves chronic inflammation of the joints and eyes that can lead to pain, vision loss, and disability. Genetics explains only why about one quarter of children develop arthritis, which means environmental triggers may also play an important role in the onset of disease.

Previous studies indicate that about a quarter of antibiotics prescribed to children - and half of antibiotics prescribed for [acute respiratory infections](#) - are probably unnecessary. "Our research suggests another possible reason to avoid antibiotic overuse for infections that would otherwise get better on their own," said Daniel Horton, a postdoctoral research fellow working in the Department of Pediatrics at Rutgers

Robert Wood Johnson Medical School. He is also a biomedical informatics master's degree candidate in the Rutgers School of Health Related Professions. Formerly a graduate student at the University of Pennsylvania and a physician at Nemours A.I. duPont Hospital for Children, Horton is lead author of the study published today in *Pediatrics*, a peer-reviewed journal of the American Academy of Pediatrics.

Researchers began the study in 2014 because of previous studies showing that antibiotics could predispose children to develop other chronic diseases, including inflammatory bowel disease. Disruption of microbial communities in the intestines and elsewhere appears to play a role in [inflammatory bowel disease](#) and other autoimmune diseases, including [rheumatoid arthritis](#) in adults. "Antibiotics are one of the better known disruptors of human microbial communities," Horton noted.

Using The Health Improvement Network (THIN), a database with information on over 11 million people across the United Kingdom, the researchers compared children with newly diagnosed juvenile arthritis with age- and gender-matched control subjects. THIN provides researchers with high quality data on diagnoses and prescriptions for people under general practitioners' care, Horton said.

Of the roughly 450,000 children studied, 152 were diagnosed with juvenile arthritis. After adjusting for other autoimmune conditions and previous infection, children who received prescriptions for antibiotics had an increased risk for developing juvenile arthritis.

Researchers also found that upper [respiratory tract infections](#) treated with antibiotics were more strongly associated with juvenile arthritis than untreated upper respiratory tract infections. Additionally, they noted that antiviral and antifungal drugs were not linked to juvenile

arthritis, suggesting that risk for arthritis was specific to antibacterial medicines.

"This is an extremely important clue about the etiology of this serious and potentially crippling disease. If confirmed, it also provides a means for preventing it," said Brian Strom, chancellor of Rutgers Biomedical and Health Sciences and a senior author on the study.

Viral infections have been suggested as triggers for juvenile arthritis, but multiple studies argue against this hypothesis. What is more clear, Horton said, is that children with juvenile arthritis have a higher risk of serious infections, in part because the immune system does not protect against infections as well as it should.

"So an alternative explanation to our findings is that this abnormal immune system makes children more susceptible to serious infection even before they are diagnosed with arthritis. Under this hypothesis, antibiotics would be a marker for abnormal immunity rather than a direct cause of arthritis," Horton added. "A majority of children get antibiotics, but only about 1 in 1,000 get arthritis. So even if antibiotics do contribute to the development of arthritis, it's clearly not the only factor."

Horton cautioned that additional research is warranted to confirm these findings and to understand the mechanism that might link antibiotic use and arthritis in [children](#).

More information: *Pediatrics*, [pediatrics.aappublications.org ...
.1542/peds.2015-0036](http://pediatrics.aappublications.org/.../1542/peds.2015-0036)

Provided by Rutgers University

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