

# Early Antibiotics May Predispose Children to IBD

BY MICHELE G. SULLIVAN

FROM THE ANNUAL DIGESTIVE DISEASE WEEK

NEW ORLEANS — Children who receive antibiotics during their first year of life may be at increased risk of developing inflammatory bowel disease before age 10, based on a case-control study presented at the meeting.

The investigators found that children with inflammatory bowel disease were almost three times more likely to have received at least one antibiotic prescription before reaching their first birthday,

## VITALS

**Major Finding:** Children who received at least one antibiotic during the first year of life were 2.6 times more likely to develop inflammatory bowel disease during childhood than were those who did not take an antibiotic during infancy.

**Data Source:** Case-control study of 393 children.

**Disclosures:** Mr. Shaw said he had no conflicts of interest. Dr. Bernstein disclosed relationships with Abbott Canada, Shire Pharmaceuticals, and UCB Pharma. Dr. Proctor disclosed relationships with Abbott Laboratories and Genentech.

compared with children in a control group.

The findings are enough to give pediatricians a moment's pause before reaching for the prescription pad, said lead author Dr. Charles Bernstein, head of gastroenterology and director of the University of Manitoba IBD clinical and research center.

"This association may give us cause to think about the overuse of antibiotics in young children, especially in those who may be at risk for developing IBD," he said in a prepared statement.

His protégé, Manitoba University doctoral student Souradet Y. Shaw, presented the data at the meeting. The investigators conducted a case-control study that used information extracted from the University of Manitoba Inflammatory Bowel Disease Epidemiological Database, which contains information on every IBD patient diagnosed in the province since 1984.

The investigators found 36 cases of pediatric inflammatory bowel disease with full prescribing records. The controls were 360 children without IBD who were matched for age, sex, and region of residence.

Most of the pediatric IBD patients had Crohn's disease (79%); the rest had ulcerative colitis. The average age at diagnosis was 8 years.

Antibiotic use was significantly more common among the cases than the controls; 58% of the cases (21 children) had received at least one prescription during their first year of life, compared with 39% (139) of the controls. About half of those prescriptions were for otitis media.

A regression analysis indicated that

cases were 2.6 times more likely than were controls to have taken antibiotics during infancy. When the investigators controlled for sex, however, the association remained significant only for boys.

"There does seem to be some link between getting an antibiotic in the first year of life and developing an inflammatory bowel disease in childhood," Mr. Shaw said. "But this was a small sample size, and shows only an association—not

a causative effect." However, the findings are strong enough to warrant further investigation in larger groups, he said.

He speculated that early transformation of the gut biome could predispose a child to inflammatory bowel disease. "One possible mechanism is that early antibiotics might change the balance between the 'good' flora and the 'bad' flora," he said. "There may also be some interference with proper immune system

exposure to the bacteria in the gut."

Dr. María T. Abreu commented in an interview, "Something is different about the environment in the developed world that leads to an increase in IBD. Therefore, it is reasonable to consider that changes in the gut microbiome may predispose to IBD.

"We also know that innate immune defects are associated with IBD, so it may be that these patients need antibi-

## With all 4 doses, she's good to grow



Give her proven protection with the only DTaP-IPV/Hib<sup>a</sup> vaccine.<sup>1-4</sup>

Keep her growing strong with all the recommended childhood immunizations.

### Help protect with all 4 doses of Pentacel vaccine and help enhance compliance

The 2008 National Immunization Survey shows that by 24 months of age, 1 in every 5 children did not receive all 4 recommended doses of DTaP vaccine.<sup>5</sup>

According to the AAP<sup>6</sup>, administering a combination vaccine may enhance timeliness and compliance.<sup>6,7</sup>

### Pentacel vaccine:

- Contains a Hib component, so it fits easily into the primary series at 2, 4, 6, and 15-18 months of age<sup>1,8</sup>
- Can save a shot at the crowded toddler visit<sup>8</sup>

Four doses of Pentacel vaccine constitute a primary pertussis immunization series.<sup>1</sup> Children should receive a fifth dose of DTaP at 4-6 years of age.<sup>1</sup>

To learn more about the efficacy, convenience, and safety of Pentacel vaccine, please visit [pentacel.com](http://pentacel.com).

To order Pentacel vaccine, log onto [VaccineShopper.com](http://VaccineShopper.com)<sup>®</sup> or call **1-800-VACCINE** (1-800-822-2463).

otics more often. Nevertheless, there are many good reasons to discourage needless antibiotic use in children," said Dr. Abreu, professor of medicine and chief, division of gastroenterology, University of Miami.

Dr. Bernstein also cautioned against interpreting the findings as indicating a cause of IBD. "It's also possible that children who require antibiotics may, for other reasons, be predisposed to developing IBD," he said. "However, if the use of antibiotics is associated with triggering IBD, it may be by [affecting] bowel flora at a vulnerable point in development."

Dr. Deborah Proctor, who moderated the session, agreed. "A baby is born with a sterile GI tract and it gets populated with bacteria in the first 1-2 years of life. The use of antibiotics during this time could change the flora and therefore could change the ratio of bacteria. This is all speculation, since this study did not address a causal association, but if it holds up in review, physicians should think twice about prescribing antibiotics in infants," said Dr. Proctor, medical director of the inflammatory bowel disease program at Yale University, New Haven, Conn. ■

Reporting from the AAP NCE 2010



PEDIATRIC NEWS reporters Sherry Boschert (left) and Alicia Ault will be onsite at NCE 2010. They'll be bringing you the specialty-specific news that has made PEDIATRIC NEWS the best-read publication in the field.

sanofi pasteur

The vaccines division of sanofi-aventis Group

Indication

Pentacel vaccine is indicated for active immunization against diphtheria, tetanus, pertussis, poliomyelitis, and invasive disease due to *Haemophilus influenzae* type b. Pentacel vaccine is approved for use as a 4-dose series in children 6 weeks through 4 years of age (prior to fifth birthday).

Safety Information

The most common local and systemic adverse reactions to Pentacel vaccine include injection site redness, swelling, and tenderness; fever, fussiness, and crying. Other adverse reactions may occur. Known systemic hypersensitivity reaction to any component of Pentacel vaccine or a life-threatening reaction after previous administration of the vaccine or a vaccine containing the same substances are contraindications to vaccination.

The decision to give Pentacel vaccine should be based on the potential benefits and risks; if Guillain-Barré syndrome has occurred within 6 weeks of receipt of a prior vaccine containing tetanus toxoid; or if adverse events have occurred in temporal relation to receipt of pertussis-containing vaccine. Encephalopathy within 7 days of administration of a previous dose of a pertussis-containing vaccine or a progressive neurologic disorder is a contraindication. Vaccination with Pentacel vaccine may not protect all individuals.

Before administering Pentacel vaccine, please see accompanying brief summary of full Prescribing Information.

CPT<sup>®c</sup> Code: 90698

<sup>a</sup> DTaP = Diphtheria, tetanus, and acellular pertussis; IPV = Inactivated poliovirus; Hib = *Haemophilus influenzae* type b. <sup>b</sup> AAP = American Academy of Pediatrics. <sup>c</sup> CPT = Current Procedural Terminology is a registered trademark of the American Medical Association.

Pentacel vaccine is manufactured by Sanofi Pasteur Limited and Sanofi Pasteur SA and distributed by Sanofi Pasteur Inc.

References: 1. Pentacel vaccine [Prescribing Information], Swiftwater, PA: Sanofi Pasteur Inc.; 2009. 2. Decker MD, Edwards KM, Bradley R, Palmer P. Comparative trial in infants of four conjugate *Haemophilus influenzae* type b vaccines. *J Pediatr*. 1992;120:184-189. 3. Granoff DM, Anderson EL, Osterholm MT, et al. Differences in the immunogenicity of three *Haemophilus influenzae* type b conjugate vaccines in infants. *J Pediatr*. 1992;121:187-194. 4. Greenberg DP, Lieberman JM, Marcy SM, et al. Enhanced antibody responses in infants given different sequences of heterogeneous *Haemophilus influenzae* type b conjugate vaccines. *J Pediatr*. 1995;126:206-211. 5. Centers for Disease Control and Prevention (CDC). Estimated vaccination coverage with individual vaccines and selected vaccination series before 24 months of age by state and local area US National Immunization Survey, 2008. [http://www2a.cdc.gov/nip/coverage/nis/nis\\_jap2.asp?fm=v&rp=tab09\\_24mo\\_jap&qtr=Q1/2008-Q4/2008](http://www2a.cdc.gov/nip/coverage/nis/nis_jap2.asp?fm=v&rp=tab09_24mo_jap&qtr=Q1/2008-Q4/2008). Accessed April 15, 2010. 6. Food and Drug Administration. Pentacel<sup>®</sup>: DTaP-IPV/Hib Combined (diphtheria and tetanus toxoids and acellular pertussis adsorbed, inactivated poliovirus and *Haemophilus b* conjugate [tetanus toxoid conjugate] vaccine combined), VRBPAC Briefing Document. <http://www.fda.gov/ohrms/dockets/ac/07/briefing/2007-4275B1-01.pdf>. Accessed April 8, 2010. 7. American Academy of Pediatrics. Combination vaccines for childhood immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP), the American Academy of Pediatrics (AAP), and the American Academy of Family Physicians (AAFP). *Pediatrics*. 1999;103:1064-1077. 8. CDC. Recommended immunization schedules for persons aged 0 through 18 years—United States, 2010. *MMWR*. 2010;58(51&52):1-4.

**Pentacel<sup>®</sup>**  
 Diphtheria and Tetanus Toxoids and  
 Acellular Pertussis Adsorbed, Inactivated  
 Poliovirus and Haemophilus b Conjugate  
 (Tetanus Toxoid Conjugate) Vaccine  
 Protection To Grow On