Office vs. ED Outcomes in Bronchiolitis Studied

BY DOUG BRUNK
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Febrile infants with bronchiolitis treated in primary care settings received a full sepsis evaluation one-half as often as other febrile infants and seemed to have even lower rates of serious bacterial illness, compared with infants treated in emergency departments and hospitals, results from a study of more than 3,000 cases show.

Those are key findings from the first large-scale study to examine primary care treatment and associated bacterial infections among febrile infants with clinically diagnosed bronchiolitis.

Although most existing studies in the medical literature have shown that the rates of serious bacterial illness in children evaluated in emergency departments or hospitalized with fever and bronchiolitis or respiratory syncytial virus (RSV) range from 0% to 10%, "No studies of the office-based care of febrile infants with clinically diagnosed bronchiolitis have been published, leaving primary care practitioners without generalizable guidelines for management," researchers led by Dr. Lynn M. Luginbuhl of the department of pediatrics at Harvard Medical School, Boston, reported.

In a report from the Pediatric Research in Office Settings (PROS) network, a research program of the American Academy of Pediatrics, Dr. Luginbuhl and her associates prospectively studied 3,066 febrile infants in 219 practices in 44 states who were evaluated between Feb. 28, 1995, and April 25, 1998 (Pediatrics 2008;122:947-54).

Infants were eligible for the trial if they had had a temperature of 38° C or higher in the office or in the preceding 24 hours at home and were previously healthy, without major comorbidity.

They compared the frequency of sepsis evaluation, parenteral antibiotic treatment, and serious bacterial illness in infants with and without clinically diagnosed bronchiolitis, which was defined in the study manual as "an infection of the bronchioles characterized by wheezing, tachypnea, fever, and cough, and is usually associated with respiratory viruses, in particular RSV. Conclusive diagnosis includes isolation of RSV from nasopharyngeal washings or positive RSV antigen. Parainfluenza A and B are also common causes."

The researchers then used logistic regression to identify predictors of sepsis evaluation and parenteral antibiotic treatment.

Clinicians made a clinical diagnosis of bronchiolitis in 218 of the 3,066 (7%) infants.

Compared with infants without a diagnosis of bronchiolitis, those with the diagnosis were significantly older (a mean of 8 weeks vs. 7 weeks, respectively) and were significantly less likely to undergo a complete sepsis evaluation (14% vs. 28%, respectively); urine testing (33% vs. 54%); cerebrospinal culture (16% vs. 32%); and to receive parenteral antibiotic treatment (33% vs. 45%).

There were no serious bacterial illnesses (SBIs) among infants with a diagnosis of bronchiolitis. SBIs among the infants without a diagnosis of the condition included 167 (5%) cases of urinary tract infection, 49 (2%) cases of bacteremia, and 14 (less than 1%) cases of meningitis.

Dr. Luginbuhl and her associates had no relevant conflicts to disclose. ■

In-Hospital *C. difficile* Rises, but Not Mortality, Colectomy Rates

BY ELIZABETH MECHCATIE
Senior Writer

Cases of *Clostridium difficile*–associated disease at children's hospitals increased significantly between 2001 and 2006, but in-hospital mortality and colectomy rates did not increase during that time, in what the authors say is the first study to report "the increasing nationwide burden" of *C. difficile*–associated disease at freestanding pediatric hospitals.

A significant increase in the use of oral metronidazole to treat *C. difficile*-associated disease (CDAD) and the preponderance of cases in children with complex medical conditions were among the other notable findings of the retrospective cohort study, conducted at 22 children's hospitals across the United States, according to Dr. Jason Kim of the division of infectious diseases at Children's Hospital of Philadelphia, and his associates (Pediatrics 2008;122:1266-70).

They pointed out that, while the incidence and severity of CDAD in adults had been increasing, the epidemiology of CDAD in the pediatric population has "remained relatively undefined."

Previous studies were usually done in one center, and provided inconsistent results. But this study was a multicenter trial and documented the largest number of pediatric CDAD cases reported—4,895 cases among children under age 18 years, they said.

The median age of these children was 4 years; CDAD was defined as a hospitalized child with a discharge code for *C. difficile* infection, a laboratory billing charge for *C. difficile* toxin assay, and an initial dose of CDAD antimicrobial therapy (oral or parenteral administration of metronidazole or oral vancomycin).

Of the cases, 54% were boys, 76% were white, 26% were aged 1 year or younger, and 5% were under 1 month of age. Most (67%) had at least one complex underlying medical condition, which among children 1 month and younger was most often a cardiovascular condition; a malignancy was the most common condition among the oldest children.

Between 2001 and 2006, the annual rate of CDAD increased from 2.6 to 4.0 cases per 1,000 admissions, a 53% increase. No regional differences in CDAD incidence were detected.

When they analyzed age groups separately, the authors found a marked increase in cases among children ages 1-5 years, from 0.7 to 1.3 cases per 1,000 admissions, an 85% increase. There were increases from 1.2 to 1.8 cases per 1,000 admissions among children ages 5-17 years. But there was no significant difference in the CDAD incidence among children under age 1 year.

Single therapy of oral metronidazole was the most common treatment (61%), use of which increased significantly over the period studied. The use of oral vancomycin, which was used to treat 3.5% of the children, did not increase during the study.

During the period studied, 61 of the children underwent a colectomy, at a median age of 2.1 years, but the rate did not increase during the study.

All-cause mortality among the children with CDAD was 4%, and did not increase, unlike the increase that has been documented in adults, they observed.

The increase in CDAD cases in the hospitalized children could be attributable to more people carrying *C. difficile*, or to an increase in the more virulent strain of *C. difficile*, the North American pulsed-field gel electrophoresis type 1 (NAP1), which "is considered a major factor for the recent increase in adults," Dr. Kim and his associates wrote.

The researchers pointed out that 26% of the cases occurred in children under age 1 year and 5% under age 1 month—a significant proportion of whom "were at an age previously thought to be unaffected by *C. difficile* toxin." ■

Key Risk Factors Identified For Bronchiolitis Relapse

BY PATRICE WENDLING
Chicago Bureau

CHICAGO — Age less than 2 months and male gender were significant independent predictors of relapse in children after ED treatment for bronchiolitis, according to a secondary analysis of a prospective, observational multicenter cohort of 1,459 patients.

Almost one in five children relapsed within 2 weeks of discharge from the ED—a number comparable with relapse rates observed in children with asthma, Dr. Muhammad Waseem and colleagues reported at the annual meeting of the American College of Emergency Physicians.

Children who had a post-ED relapse event were significantly more likely than those who did not to be younger than 2 months and male.

Bronchiolitis is a common condition in children younger than 2 years—yet there is little, if any, evidence for physicians and parents about which children will have a worsening of their disease after being discharged home from the ED, Dr. Waseem said.

Children younger than 2 years (median 6 months) were enrolled at 30 sites in 15 states during two consecutive bronchiolitis seasons: Dec. 1, 2004, through March 31, 2005, and Dec. 1, 2005, through March 31, 2006. A total of 58% of the Multicenter Airway Research Collaboration cohort's children were male; 38% of patients were white, 31% were black, 26% were Hispanic, and 4% were categorized as other.

Among the 1,243 (85%) patients for whom telephone follow-up was completed at 2 weeks, 722 (58%) were discharged home and met the analysis criteria.

Among the 717 children with relapse data, 121 (17%) had a post-ED relapse event defined as any urgent visit to an ED or clinic for worsening of bronchiolitis during the 2-week follow-up period.

Using a more restrictive definition of worsening of bronchiolitis that included changing the child's medication or hospital admission, 80 children (11%) relapsed, the researchers reported.

Children who had a post-ED relapse event were significantly more likely than those who did not to be younger than 2 months (11% vs. 6%) and male (70% vs. 57%), said Dr. Waseem, an attending physician in emergency medicine at Lincoln Medical and Mental Health Center, Bronx, N.Y., and an associate professor in emergency medicine at Cornell University Medical School, New York.

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