Serogroup 22 Is Developing as a Meningitis Threat

BY PATRICE WENDLING
Chicago Bureau

TORONTO — Serogroup 22 is emerging as an important cause of pediatric meningitis, Dr. Carrie L. Byington and her associates reported in a poster at the Pediatric Academic Societies annual meeting.

Serogroup 22 appears to have a greater propensity to cause meningitis than other vaccine or nonvaccine serotypes, according to an analysis of 300 cases of pediatric invasive pneumococcal disease (IPD) among patients under age 18 years in Utah.

Serogroup 22 appeared to have a greater propensity to cause meningitis than other vaccine or nonvaccine serotypes in a Utah study.

Serogroup 22 is not included in the licensed 7-valent pneumococcal conjugate vaccine (PCV-7) or in higher-valent vaccines under investigation.

Of the 300 cases of pediatric IPD that occurred from 1997 to 2005 at Primary Children's Medical Center in Salt Lake City, 52 were meningitis with or without bacteremia.

During the period prior to the licensure of the PCV-7 vaccine from 1997 to 2000, serotypes 14 (24%), 19F (16%), and 6B (12%) most often caused meningitis.

During the post–PCV-7 period from 2001 to 2005, serogroup 22 (19%), 14 (11%), 18C (11%), and 3 (7%) were the most common groups.

When analyzed by serogroup, 7 of 11 serogroup 22 isolates (64%) were recovered in blood and cerebrospinal fluid from children with meningitis, reported Dr. Byington, professor of pediatrics and associate chair for clinical research at the University of Utah, also in Salt Lake City, and her associates.

When compared with other non-PCV serotypes that caused meningitis (types 3, 7, 15, and 33), serogroup 22 was more likely to be associated with meningitis (64% vs. 20%), with a relative risk of 3.8.

Serogroup 22 also was more often associated with meningitis than the PCV-7 vaccine serogroups 14, 19F, and 6B (64% vs. 42%), with a relative risk of 2.14.

The findings may be related to the fact that individual serotypes of *Streptococcus pneumoniae* have differing propensities to colonize and cause invasive disease, Dr. Byington said in an interview.

"For example, in Utah, we have not documented a single pediatric isolate of serotype 1 that has resulted in colonization," she said. "Rather, all isolates of serotype 1 have been from children with invasive disease, specifically complicated pneumonia.

"As we continue our surveillance, we undoubtedly will learn more about serogroup 22 and its propensity to cause IPD."

Although meningitis cases nationally have declined significantly since the PCV-7 vaccine was approved, the trend was not significant in the Utah data.

Meningitis made up 20% of invasive pneumococcal disease cases in the prelicensure period (25/127) and 16% (27/173) in the postlicensure period, Dr. Byington and her associates reported

The gains experienced by the rest of the United States were not seen in Utah because prior to the introduction of PCV-7, Utah had a high proportion of invasive pneumococcal disease caused by nonvaccine serotypes, Dr. Byington explained.

"This mismatch may then have allowed for more rapid serotype replacement than what has been seen in other parts of the U.S., including the emergence of serogroup 22," she said.

It is hoped that these pneumococcal serogroup data may inform future vaccine design, Dr. Byington and her associates concluded. ■

High Procalcitonin, CRP Predict Severe Bacteremia in Infants

BY MICHELE G. SULLIVAN
Mid-Atlantic Bureau

Elevated procalcitonin and C-reactive protein are highly predictive of a severe bacterial infection in infants and young children admitted to the emergency department with fever without a source, investigators reported.

With their optimal cutoff points, procalcitonin (PCT) and C-reactive protein (CRP) had both better sensitivity and specificity for severe bacterial infections than either white blood cell or absolute neutrophil count, said Dr. Barbara Andreola of the University of Padova, Italy, and her coinvestigators. CRP has long been studied as a sensitive marker of bacterial infection, and there has been mounting interest in PCT. The aim of this study was to investigate their diagnostic use, compared with the current markers being used.

PCT and CRP had both better sensitivity and specificity for severe bacterial infections than either white blood cell or absolute neutrophil count.

The prospective observational study included 404 infants and children younger than 3 years who were admitted to an emergency department with fever of unknown origin. The patients' median age was 10 months; 107 were infants younger than 3 months. Duration of fever was less than 24 hours in 143 children and less than 8 hours in 45 children (Ped. Infect. Dis. J. 2007;26:672-77).

A final diagnosis of severe bacterial infection (SBI) was made in 94 patients (23%); among those without SBI, 16% had focal bacterial infections, 9% had proven viral infections; and the rest of the patients had probable viral infections.

Blood work included tests for PCT and CRP levels, as well as white blood cell and absolute neutrophil counts. In a multivariate regression analysis, PCT and CRP were significantly better predictors of severe bacterial infection than cell counts or clinical assessment. An elevated white blood count was associated with twice the risk for SBI, while an elevated neutrophil count was associated with an increased SBI risk of 38%.

At a cut-off of 1 ng/mL, PCT was associated with a 6-fold increase in the risk of a severe bacterial infection, while a level of more than 2 ng/ml was associated with a more than 13-fold increased risk.

A CRP of more than 40 mg/L was associated with a fourfold increase in the risk of SBI, while a level of more than 80 mg/L was associated with more than an eightfold increased risk.

PCT also predicted specific organ involvement, Dr. Andreola and her associates said, with the highest values found in sepsis and meningitis. In children with fever of less than 8 hours' duration, PCT was the best predictor of SBI. "PCT seems to be a more accurate predictor at the beginning of an infection whereas CRP, if correctly employed by taking into account the time needed for its rise in the bloodstream, may be a better screening test in emergency settings, because of its overall better sensitivity and feasibility—its lower cost, better availability, and better historical practice," they said. ■

Watch for Recurrent Otitis Media in Children Who Snore

BY HEIDI SPLETE
Senior Writer

MINNEAPOLIS — Children with frequent, loud snoring are significantly more likely to develop recurrent otitis media and to require tympanostomy tubes than are children who don't snore, based on data from more than 16,000 children aged 5-7 years.

Recurrent otitis media and habitual snoring share many risk factors. To assess the relationship between these conditions, Dr. David Gozal of the University of Louisville (Ky.) and his colleagues compared the frequency of recurrent otitis media (ROM) and the need for tympanostomy tube placement in school-aged children who snored versus those who did not snore.

Children with a history of habitual snoring were almost three times more likely than those without such a history to have had tympanostomy tubes.

The researchers presented their findings in a poster at the annual meeting of the Associated Professional Sleep Societies.

Parents of 16,321 children who attended public school in Jefferson County, Ky., completed questionnaires about their children's sleeping habits.

Overall, 1,844 children (11%) had a history of habitual snoring (defined as snoring more than 3 nights per week). More than half (53%) of the habitual snorers were boys, and 26% of the habitual snorers were black.

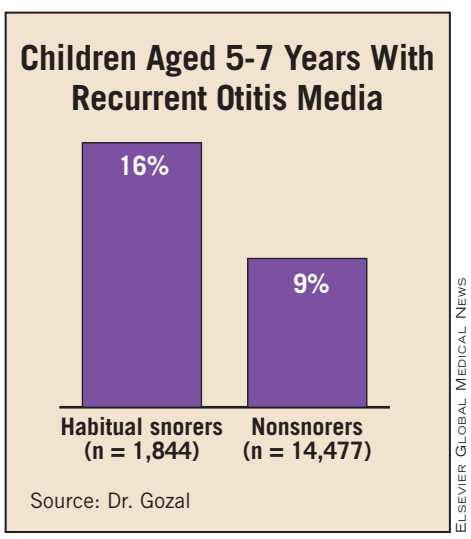
A total of 5,074 children had a history of ROM, and 2,604 children had tympanostomy tubes.

Nearly twice as many of the habitually snoring children had a history of ROM, compared with children who did not snore (16% vs. 9%), even after controlling for known otitis media risk factors such as asthma, chronic rhinitis, allergies, and exposure to cigarette smoke, they reported.

Similarly, children with a history of habitual snoring were almost three times more likely than children without a history of snoring to have had tympanostomy tubes placed (24% vs. 9%, respectively), after controlling for the same risk factors, the investigators found.

The findings support an association between habitual snoring and an increased risk of ROM and need for tympanostomy tubes.

Additional studies are needed to assess the prevalence of obstructive sleep apnea in children with ROM, the investigators wrote. ■



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