ID CONSULT

Predictions for '09: What's Old Is New Again

BY MARY ANNE JACKSON, M.D.

Happy 2009! It's time for the annual look into the future of infectious diseases.

Two common themes were evident last year: increasing antibiotic resistance, and changing epidemiology and vaccine-preventable infections. Last year's predictions that were on the mark included the rise in pneumococcal serotype 19A, the drop in rotavirus cases, the lack of a national solution to vaccine reimbursement, the need for new strategies to raise vaccine coverage rates, and the rise in methicillin-resistant *Staphylococcus aureus* (MRSA) infections. This year, some similar themes prevail and some items may surprise you:

► MRSA will become a more prominent pathogen in your local neonatal intensive care unit (NICU). Practicing pediatricians are well aware of the emergence of MRSA. As evidence, most have probably drained more abscesses in the last year than in their entire career to date. Sporadic phone calls have alerted us to cases of MRSA infection in community hospital nurseries, and while we have not encountered a NICU outbreak of MRSA infection, they are well reported and may be difficult to halt. Active NICU surveillance (periodic nasal screening), screening of new admissions hospitalized elsewhere, and utilization of contact precautions (until results are available) may be necessary.

► Multidrug-resistant gram-negative infections will emerge throughout pediatric hospitals, and no new help is on the horizon for these bad bugs, which have been coined the ESKAPE bacteria. They include two gram-positive bugs—*Enterococcus faecium*, *Staphylococcus aureus*, and gram negatives including four species of *Klebsiella*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, and *Enterobacter* species—which together are responsible for two-thirds of all health care–associated infections. While a few new drugs are available or coming for MRSA, there are few that target gram-negative pathogens. For more information, check out the article by Dr. Helen Boucher of Tufts University (Clin. Infect. Dis. 2009;48:1-12).

► Parental declinations of certain vaccines will plateau. No question that pediatricians are spending an increasing amount of time addressing parental concerns regarding vaccines, but the majority of parents still trust their pediatrician to provide appropriate vaccine information. The key, though, is making sure you appropriately address their concerns and deliver a clear and positive message with high-quality information.

Check out Meg Fisher's article in the September 2008 Pediatric Infectious Disease Journal for a great discussion of vaccine safety (Pediatr. Infect. Dis J. 2008: 27:827-30).

► Pertussis cases will hit an all time low overall but beware: Outbreaks will still occur, particularly among older children. Implementation of the adolescent/adult tetanus-diphtheria-reduced antigen acellular pertussis (Tdap) vaccine is ongoing, but we still have a large susceptible population of children aged 8-12 years, as well as adults. We recently cared for a 5-week-old infant with whooping cough who required ECMO (extracorporeal membrane oxygenation). I suspect we will continue to see such cases.

The role of postpartum Tdap is important, and pediatricians should encourage their obstetrics colleagues to use a standing order to give vaccine to mothers before hospital discharge (if they have not received a tetanus-containing vaccine in the past 2 years, or prior Tdap).

► The new improved pneumococcal conjugate vaccine may be closer than you think. The emergence of multidrug-resistant serotype 19A disease has challenged the management of pneumococcal infection from acute suppurative otitis media to more serious infections like pneumonia and meningitis. Last May, the Food and Drug Administration granted fast-track designation for the Wyeth 13-valent vaccine (which includes 19A) to speed the process.

► Cases of *Clostridium difficile* will increase. In 2005, the Centers for Disease Control and Prevention alerted us to the reports of an increase in incidence and severity of *C. difficile*–associated disease (CDAD), both community acquired and health care–facility acquired or associated. While most practitioners are aware that the major driving force in CDAD is antimicrobial use, this strain appears to be causing infection in otherwise healthy persons who haven't received antibiotics. One study confirmed that with respect to health care–associated CDAD, the availability of adequate infection control personnel was associated with lower rates.

► You might see *Haemophilus influenzae* type b (Hib) invasive infection in the coming year. A Nov. 21 CDC report detailed information regarding the continued vaccine shortage (MMWR 2008; 57:1252-5). (See Policy & Practice item, p. 23.) Vaccine supplies currently are insufficient to supply the booster dose, and some studies suggest that this dose is particularly important for protection and herd immunity. In the United Kingdom, a booster dose was not initially recommended; after an initial decrease in disease, the rate of invasive infection rose again. There is concern that prolonged deferral of the Hib booster in the United States may produce similar results, so be on the look out.

► Most physicians are still unaware of the new guidelines for subacute bacterial prophylaxis. In 2007, the American Heart Association issued the first major revision of these guidelines and endorsed antimicrobial prophylaxis for only five circumstances: prosthetic heart valves, prior infective endocarditis, cardiac transplant with valvulopathy, unrepaired cyanotic congenital heart disease, and repaired congenital heart disease with either prosthetic patch or other device in the first 6 months after placement or beyond that if there is a residual defect at the site of patch or device. Read more about it at: www.americanheart.org/presenter.jhtml?identifier=3047051.

► A rise in tuberculosis cases will occur in the United States. A recent study in Clinical Infectious Diseases showed a particular risk for undocumented immigrants with tuberculosis to be sicker longer than documented immigrants or U.S.-born patients. With this comes a potential for increased risk for transmission.

► Do you know about the CDC's Web site for students who are planning to Study Abroad (www.cdc.gov/Features/StudyAbroad)? It seems that international travel is becoming a right of passage. This site provides information on a variety of infection- and non–infection-related topics, and connects you to other key Web sites. Check it out, pass it on, and I wish you the best in 2009. ■

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Varicella/speC Gene May Up Risk of Necrotizing Fasciitis

BY KERRI WACHTER
Senior Writer

WASHINGTON — Recent varicella infection and the presence of a specific virulence factor gene were strongly associated with the development of necrotizing fasciitis among Quebecois children with invasive group A streptococcal infections, according to a retrospective analysis involving 68 patients.

Children with varicella had a sixfold greater risk of necrotizing fasciitis (odds ratio 6.2) and those with the speC gene had a fourfold greater risk (odds ratio 4.0), on the basis of a multivariate analysis, Dr. Philippe Ovetchkine reported at the jointly held annual Interscience Conference on Antimicrobial Agents and Chemotherapy and the annual meeting of the Infectious Diseases Society of America.

"The story began a few years ago in Montreal, when we observed a high number of children hospitalized for invasive group A streptococcal infections. In particular, we noticed concomitant necrotizing fasciitis," said Dr. Ovetchkine, a pediatrician at the Sainte-Justine Mother and Child University Hospital Center in Montreal. This observation was recently confirmed by the public health department of Quebec.

The researchers conducted a retrospective chart review of all children (younger than 18 years) with documented invasive group A streptococcal infections from January 1999 to December 2007, in order to understand the risk factors for necrotizing fasciitis. Necrotizing fasciitis (NF) cases occurred only during the years 2003-2005.

Invasive group A streptococcal infection was defined as the presence of a compatible clinical presentation and the isolation of group A streptococcus from a normally sterile body site; NF was defined as the presence of necrosis in the fascia and polymorphic infiltrate. A total of 68 children with invasive group A streptococcal infections (44% girls, mean age 60 months) were identified. Group A streptococcus was recovered from blood culture in 38 of the children, cerebrospinal fluid in 2, articular fluid in 4, pleural fluid in 7, and surgical intraoperative samples in 17. Eighteen children had NF, all of whom required surgical intervention.

Recent varicella was significantly more common in the children who developed NF than in those who did not—56% and 14%, respectively. Toxic shock syndrome was also significantly more common among those who developed NF (33%) than in those who did not (4%). On multivariate analysis, toxic shock syndrome was not found to be a significant factor in the development of necrotizing fasciitis. This may be because of the low number of cases (six in the NF group and two in the group without), Dr. Ovetchkine said in an interview.

Group A streptococcal isolates were evaluated for cell surface M virulence protein gene (emm) typing and the presence of several virulence factor genes (speA, speB, speC, ssa, smeZ, and sic). In terms of M protein genes, emm1 (30%) and emm12 (17%) were predominant. In some patients without NF, the researchers did observe speC genes in the streptococcal strains.

Dr. Ovetchkine hypothesizes that the presence of the speC gene can lead to a specific phenotype of invasive group A streptococcal infections: necrotizing fasciitis. "Moreover, speC could act as a superantigen and favors the occurrence of toxic shock syndrome in this context," he said.

Dr. Ovetchkine stated that he had no conflicts of interest to disclose regarding his presentation. ■