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Monitor the 2009-H1N1 Influenza Outbreak

BY MARY ANNE JACKSON, M.D.

We are learning more daily about the 2009-H1N1 influenza, now also called the novel H1N1 flu, as the outbreak unfolds. It will be critical for us as clinicians to stay on top of developments so that we can tailor our patient care accordingly. Although disease activity seems to be decreasing, taking what we know today and preparing for fall is imperative.

As the name suggests, this strain of the virus has never circulated in the population before, but there has been some speculation that the low rate of disease in persons older than age 50 years may relate to circulation of a closely related strain decades ago.

Public health officials' main concern has been that with a large susceptible population, the outbreak will evolve into a major global pandemic with high morbidity and mortality, as occurred in 1918. Estimates from the Centers for Disease Control and Prevention suggest that even if this outbreak is a moderate one, up to 35% of the U.S. population could be infected and up to 207,000 people could die.

What is important to us as pediatricians is that in times of pandemic flu, mortality has been highest among the young and healthy. Some investigators propose as an explanation that the virus provokes a cytokine storm in people with a robust immune system, resulting in a kind of immunologic paralysis. Indeed, initial reports from Mexico suggested that most flu deaths were occurring in otherwise healthy individuals; authorities there are now reviewing their data to better assess who may be at greatest risk.

The clinical picture of influenza is usually easy to recognize: an abrupt onset of fever, cough, sore throat, and rhinitis. In a recent study from Finland, myalgia and headache were less common in children than they were in adults. At our institution, in the recent outbreak, we have gotten more selective about which children we test for influenza because we found that using the CDC criteria of a fever of at least 37.8° C and a runny nose, we picked up a lot of common colds and croup. In our first 15 pediatric cases of this flu, the mean fever was much higher at 39.8° C. So the low-grade fever used to guide testing in adults is probably not going to be reliable in children.

Another discovery has been that our rapid influenza test is not sensitive for the H1N1 virus; therefore, such testing may not aid in diagnosis. The take-home message is that it's wise to check with your local infectious disease specialists about the diagnostic performance of the rapid test used by your laboratory. In contrast, we have found that the multiplex polymerase chain reaction test that we use has reliably picked up all cases of H1N1 flu, although it identifies them as influenza A isolates that are not able to be subtyped using standard H1N1 primers.

Education will be key in responding to this outbreak. The worried well are flocking to their doctors' offices and sitting in waiting rooms next to those with mild influenza, who also don't need to be there. At our institution, we are distributing a handout to parents that explains that influenza testing and antiviral therapy are not needed for mild influenza. We instruct them in how to provide home care and about warning signs that mean they should seek care for their child.

At this point, antiviral therapy among children with influenza is mainly being restricted to those admitted to the hospital and those at high risk for complications. The latter group includes, among others, children younger than age 5 years, but particularly those younger than age 2. If more than 48 hours have elapsed since symptom onset, the therapy may have little effect, so symptomatic management alone is reasonable. Antiviral prophylaxis should be considered for exposed siblings who are at high risk for influenza complications.

Pediatricians need to be vigilant and prepared for the known possible complications of influenza, especially superinfection including bacterial pneumonia. Some of the less common complications can have tricky presentations in the pediatric population. For example, in children, influenza-related encephalopathy can manifest as aphasia, and in some children with influenza-associated myositis, parents may contact their provider with the concern that their child has an acute onset of paralysis as the child refuses to walk.

In contrast to adults with influenza, who are infectious to others for roughly 6 days, children are infectious for at least 10 days. This is going to be problematic because it may be necessary to maintain barrier protection for hospitalized children for longer than a week.

The novel H1N1 outbreak has clearly been taxing the health care system and health care providers, especially on the outpatient side. Although we have been preparing for such an event for years, several logistical problems have emerged. One is a shortage of N95 masks, a required piece of personal protective equipment when caring for hospitalized patients with pandemic influenza. Another is a shortage of staff, as personnel with suspected or confirmed infection must stay home.

We are anticipating that a vaccine against the 2009-H1N1 virus could be available by September or October. It's likely going to require two shots, in addition to the standard seasonal influenza shot. This might be a hard sell to vaccine-hesitant parents under usual circumstances, but it is too soon to tell what the reception will be like in the context of the current outbreak.

Public health officials are hoping transmission of the virus will decrease naturally with the end of the school year. However, resurgence of the 2009-H1N1 disease in the fall is a possibility that we need to be prepared for, particularly if new mutations increase its virulence. ■

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Refusal to Vaccinate Against Pertussis Ups Risk Radically

BY MICHELE G. SULLIVAN

Children whose parents refused the pertussis vaccine were 23 times more likely to contract the disease than were children whose parents allowed them to receive the vaccine, a case-control study found.

Of 156 pediatric pertussis cases identified in a large health care database, 18 (12%) had not received the pertussis vaccine because of parental refusal. Of the 595 matched controls, only 3 (0.5%) had parents who refused to have them vaccinated, Jason M. Glanz, Ph.D., and his colleagues reported (Pediatrics 2009;123:1446-51).

The study was conducted in Colorado, a state with generally high rates of childhood immunization, wrote Dr. Glanz of the Kaiser Permanente Colorado Institute for Health Research, Denver. "Despite high pertussis immunization rates in Colorado, herd immunity did not prevent a high relative risk for pertussis in vaccine refusers," he and his colleagues observed. "This is likely because of a combination of waning immunity to pertussis in adolescents and adults, ongoing endemic circulation, the highly contagious nature of the bacterium, and frequent asymptomatic infections."

The study offers a sobering look at the results of the growing trend of vaccine refusal, Dr. Randy Bergen said in an interview. Dr. Bergen, chair of the pediatric infectious disease section at Kaiser Permanente of Northern California, Walnut Creek, said the antivaccine campaigns of several outspoken celebrities continue to influence parental decisions about their children's health care. "And not only are these unvaccinated children being put at risk of contracting an infectious disease, they are putting vaccinated children at risk as well."

The study examined pertussis vaccination rates and disease prevalence in children aged 2 months to 18 years enrolled in the Kaiser Permanente of Colorado health plan between 1996 and 2007. Each case of pertussis was matched to four randomly selected controls.

Children were considered "vaccine refusers" if their medical charts documented a parental refusal of one or more pertussis immunizations for nonmedical reasons. The review identified 156 children who had a confirmed diagnosis of pertussis during the study period. Of these, 17 (11%) had parents who refused all the recommended pertussis immunizations; 1 additional child received only one of the five recommended doses. Six percent had to be hospitalized for the illness. The mean duration of cough at diagnosis was 12 days.

The cases (mean age, 9 years) were matched with 595 controls, none of whom contracted the disease. Only three of the control children (0.5%) had parents who refused one or more pertussis immunizations. Children who were not vaccinated were 23 times more likely to contract pertussis than were vaccinated children.

Because some of the children in the primary analysis were not Kaiser members during the entire first 20 months of their life, when they would have received all four primary vaccine doses, the investigators conducted a secondary analysis of 27,748 children who were continuously enrolled in the program from 2 to 20 months of age. This cohort included 31 children with confirmed pertussis infections, who were matched with 308 controls. Among the cases, 13% had parents who refused the vaccine; only 0.7% of controls had parents who refused.

"The study highlights the need for effective risk communication between parents and physicians about vaccines and the diseases they prevent," Dr. Glanz and his colleagues wrote.

Dr. Bergen, who is also a practicing pediatrician, agreed, saying that many parents who express concerns about vaccine safety feel more confident after hearing the scientific evidence of their safety. A second group, however, is tougher to convince. "These parents are adamant in their mistaken impression that vaccines are dangerous, and they will not be dissuaded by any information about the severity of the infections vaccines prevent, or the lack of any evidence that vaccines cause autism or any other harm."

"This study suggests that parents who don't vaccinate are putting the community at risk, as well as their own children," Dr. Bergen suggested. "It's similar to the secondhand smoke argument. I understand that those parents are entitled to their choice, but why is that choice more important than another parent's choice to vaccinate? I may not have the right to make the decision for a parent, but as a parent, I do have the right to have some input about the environment my child is in."

Dr. Glanz and his associates indicated that they had no conflicts to disclose. Dr. Bergen likewise had no conflicts of interest. ■