BY MICHAEL E. PICHICHERO, M.D.

ID CONSULT

New Viruses Are an Old Story

We're seeing a lot of new viruses lately, but that's nothing new.

The novel pandemic H1N1 flu is just one of many emerging viruses that we're seeing clinically, although we may not always recognize them. Metapneumovirus, bocavirus, and norovirus are three others. But new viruses have been emerging since time began. One of my favorite books, Jared Diamond's "Guns, Germs, and Steel: The Fates of Human Societies" (New York: W.W. Norton & Co., 1997), describes how the Europeans who conquered the New World were aided in large part by the diseases they brought with them to a vulnerable population, a weapon at least as successful as those designed for warfare.

Diamond, a geography professor at the University of California, Los Angeles, who won a Pulitzer prize for his book, also points out that from the beginning of time, humans have acquired mutated germs from animals, resulting in disease of varying severity. The Europeans conquered by spreading new disease.

Of course, the current pandemic influenza A(H1N1) strain that we're dealing with now didn't come from human conquerors, but it did come from animals—more than one type, in fact. The virus was originally referred to as swine flu because laboratory testing showed that many of its genes were similar to those of influenza viruses that normally occur in pigs in North America.

However, now it is clear that this new virus is different from that which normally circulates in North American pigs, and actually includes genes from influenza viruses that normally circulate in pigs in Europe and Asia, along with avian genes and human genes, according to the Centers for Disease Control and Prevention.

Although this influenza strain surprised us in a couple of ways—it didn't come from birds and it isn't as virulent as we would have expected from a genetically "shifted" virus—the fact that a novel strain has arisen and is being transmitted from human to human is not a surprise.

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Clinically, we are hoping that we have a safe and effective vaccine against the new H1N1 strain and that the supply will be sufficient to allow us to vaccinate all of our patients in a timely manner. In the meantime, the CDC's Advisory Committee on Immunization Practices has drafted new recommendations for the use of antivirals in the upcoming influenza season.

A second emerging virus, human metapneumovirus, was first isolated just 8 years ago, in previously virus-negative nasopharyngeal aspirates from children with respiratory tract infections. Since then, it has been seen worldwide, mainly circulating during the winter and spring. It is closely related to respiratory syncytial virus (RSV), and its clinical appearance resembles that of RSV in many ways, ranging from mild upper respiratory tract infections to wheezing to bronchiolitis, particularly in children less than 1 year of age. Metapneumovirus is generally milder than RSV, although the two infections often occur together.

The two infections are also essentially managed the same way—supportively, or with oxygen if the child becomes hypoxic. But this approach is far less likely with metapneumovirus than with RSV.

In a child with a clinical picture suggesting viral bronchiolitis in the hospital setting, a rapid test for RSV can help to determine whether the child can room with another child who also has RSV. If the test is negative, assume that you're dealing with metapneumovirus alone, and keep the child away from RSV-infected children. In the ambulatory setting, such testing is unlikely to be helpful.

Be aware that like RSV, metapneumovirus can also exacerbate asthma symptoms.

Bocavirus, another newly identified viral pathogen, is closely related to the parvovirus that pediatricians know as the cause of Fifth disease. Clinically, bocavirus is another RSV mimic. Children often present with wheezing in the context of an upper respiratory infection, which can easily be mistaken for asthma. In terms of severity, it probably ranks about the same as metapneumovirus.

Finally, norovirus is an emerging gastrointestinal virus that's been in the news a lot in recent years as the cause of gastritis on cruise ships. Symptoms include diarrhea, abdominal pain, and vomiting. In young children, it's fast surpassing rotavirus as the most common cause of this clinical picture, now that rotavirus vaccination is routine. Like rotavirus, norovirus is highly contagious. It may be transmitted through food, and is the likely culprit when more than one family member is affected. On the bright side, the course of illness for norovirus is shorter than that of rotavirus. Symptoms are usually gone after 1-2 days, as opposed to 5-7 days for rotavirus.

If you haven't had a chance, I highly recommend "Germs, Guns, and Steel." It came out in 1997, but still resonates today. Diamond's 2005 book, "Collapse: How Societies Choose to Fail or Succeed" (New York: Penguin Group [USA] Inc.) is also worth reading. While the first book shows us how societies succeed, the 2005 book discusses how they can fail. We certainly see both sides in our battles with emerging and ongoing infections. ■

DR. PICHICHERO, *a specialist in pediatric infectious diseases, practices in Rochester, N.Y. He is also professor of microbiology, immunology, pediatrics, and medicine at the University of Rochester. To respond to this column, e-mail Dr. Pichichero at pdnews@elsevier.com.*

School Program Improves Flu Vaccine Coverage in Texas

BY KERRI WACHTER

BALTIMORE — School-based influenza vaccination programs can improve the vaccination rate for school-aged children, but getting tweens and teens to participate can be hard, based on a study of school districts in central Texas.

"Expansion of the school-based immunization trial from elementary to middle and high schools improved influenza immunization coverage in school-aged children to 40%," Dr. Manjusha Gaglani said at a conference on vaccine research sponsored by the National Foundation for Infectious Diseases. This compares with 30% coverage achieved with community-based vaccinations.

On average, influenza immunization coverage was 48%, 28%, and 22% for 26 elementary, 10 middle, and 8 high schools (public), respectively, in the 2007-2008 school year. Average coverage was 52% for parochial schools, 34% for home-schooled children, and 10% for public schools (K-12). The community-based influenza immunization field trial achieved influenza vaccine coverage of 15%-30% of school-aged children between 1998 and 2006. In 2007, a school-based trial was initiated in local elementary schools. The trial was expanded to middle and high schools during the 2008-2009 school year to increase influenza immunization coverage in school-aged children.

Middle and high school students had lower rates of vaccination coverage than elementary children, even though information packets were mailed directly to parents instead of having students take them home, as elementary school students did, said Dr. Gaglani, a pediatric infectious diseases specialist at the Scott and White ambulatory pediatric clinic in Temple, Tex.

The information packets included a letter to parents, a brochure on the program, an influenza vaccine permission form, an assent script for children, an optional nonparticipation form, information about live and inactivated influenza vaccines, and privacy authorization forms. Parents were asked to call with questions and could choose to be present for the immunization either at school or a pediatric clinic. Parents could state a preference for inactivated influenza vaccine and were asked to schedule second doses for eligible children at the Scott and White pediatric clinic.

Approximately 2-4 weeks before the scheduled influenza vaccination day, informed consent and assent were obtained from the parent and capable children 7 years of age or older. Influenza vaccine permission forms containing children's demographic and health information were completed, signed, and dated by the parent and child, and collected by teachers and/or school nurses. School staff organized student flow, and research staff triaged students for live or inactivated influenza vaccine based on the child's health information. Research, public health, and school nurses and investigators administered the vaccines during school hours. Vaccinated students were given a "Guide to Study Participants" and a 6-week health report postcard. Children also were offered "flu fighter" stickers.

The enhanced program involved health care entities and independent school districts. In the program's second year (2008-2009), children aged 4-18 years were enrolled from 45 intervention-area schools—7 public school districts and 5 parochial schools. Home-schooled children also were included.

In all, approximately 22,914 information packets were sent to students. Between Sept. 22 and Dec. 18, 2008, immunization day was conducted at 48 schools, 2 days each at two high schools, and at a church for home-schooled students. Students also were enrolled at the pediatric clinic during six weekend and nine evening clinics, and at one community event. Based on the preliminary results, live nasal spray influenza vaccine was administered to 77% of a total of 9,007 students enrolled in the program.

An additional 588 students and 60 students were immunized at the pediatric clinic and community event, respectively. In addition, 1,878 school staff were vaccinated (67% received the trivalent inactive vaccine). Of the 652 students who returned nonparticipation forms, 91 students reported receiving the influenza vaccine. Another 267 said they would receive the influenza vaccine from their physician.

Dr. Gaglani reported that she has received grants from MedImmune Inc., Sanofi Pasteur Inc., GlaxoSmithKline, and Novartis, and that she is a consultant/speaker for MedImmune and Sanofi Pasteur. In addition, Sanofi Pasteur supplied the vaccine used in the study. ■