Technique, Teens' Weight Influence Needle Length

BY BRUCE K. DIXON
Chicago Bureau

CHICAGO — Body weight and injection technique should guide the choice of needle length when immunizing adolescents during immunizations, according to a poster study presented at the annual Interscience Conference on Antimicrobial Agents and Chemotherapy.

"We looked at the performance of a 5/8-inch vs. a 1-inch needle—using both pinching and flattening of the injection site—in relation to the recipient's body weight," Dr. Michael Koster said.

Using a needle that is too short may result in reduced immunogenicity and more adverse reactions to vaccines that are intended for intramuscular injection, whereas using a needle that is too long may strike bone and injure underlying neurovascular structures, Dr. Koster said in an interview.

For both the pinching technique and the muscle-flattening technique on adolescents weighing 88-155 pounds, a 1-inch needle is appropriate. For those weighing less than 88 pounds, the shorter needle is best, said Dr. Koster, who conducted the study at Schneider Children's Hospital at North Shore in Manhasset, N.Y.

The investigation included 141 participants aged 11-15 years. Of the total, 28% of the participants weighed less than 88 pounds, while about 20% weighed more than 132 pounds, said Dr. Koster, now a pediatric infectious disease fellow at Hasbro Children's Hospital in Providence, R.I.

The investigators recorded the adolescents' height, weight, and arm circumference, and conducted upper-arm ultrasonography during both muscle pinching and skin flattening of the participants' nondominant arms. These ultrasound measurements were duplicated by a second investigator and averaged for analysis.

"When injecting someone [while using] the pinching technique, you increase muscle and subcutaneous tissue layers, in which case you'll want a little longer needle. When flattening, typically using the forefinger and thumb, you can go up to [a weight of] about 50 kilos [110 pounds] and be safe in terms of getting the vaccine into the muscle without striking bone," Dr. Koster said at the meeting, which was sponsored by the American Society for Microbiology. As a general rule, with the pinching technique, a 1-inch needle is appropriate most of the time, and the shorter needle is appropriate only for patients who weigh less than 88 pounds.

'Independent of technique, it would be appropriate to use a 5/8-inch needle on subjects less than 88 pounds.'

DR. KOSTER

With the flattening technique, the shorter length is appropriate only three-quarters of the time and only on patients weighing less than 110 pounds. "Independent of technique, it would be appropriate to use a 5/8-inch needle on subjects less than 88 pounds," he said.

Although females had a larger subcutaneous layer than did males of the same body weight, the difference did not result in the use of a different needle length, Dr. Koster said, adding that body weight was a better predictor of required needle size than was arm circumference.

The American Academy of Pediatrics Red Book makes needle length recommendations for adolescents only in terms of body weight and sex. For example, both sizes of needles are recommended for those who weigh less than 132 pounds. The 1-inch needle is recommended for females who weigh 132-198 pounds and males who weigh 132-260 pounds. The AAP recommends an even longer (1½-inch) needle for females over 198 pounds and males over 260 pounds. Only 2 of the 141 subjects were that heavy, and the data on these two still are being analyzed.

Data from previous studies have suggested that obese adolescents who are immunized with 1-inch needles develop lower hepatitis B virus (HBV) vaccine titer levels, compared with those vaccinated with 1½-inch needles, and this seemed to have been borne out by findings in a limited study of 24 obese subjects aged 14-24 years (J. Adol. Health 2006;38:101).

In that study, after randomization to 1-inch and 1½-inch needle groups, subjects (females over 198 pounds and males over 265 pounds) were given an HBV vaccination using a 0-, 1-, and 4-month schedule. HBV surface antibody was obtained 2 months after the third vaccination, and data showed that the final titer levels in the 1½-inch needle group were statistically significantly higher than in those in the 1-inch needle group.

"I hope that adjustments are made in the 2009 Red Book to reflect our finding that optimal needle length is influenced by intramuscular injection technique," Dr. Koster said, adding that there is heightened need for these data because several vaccines recently have been licensed and recommended for all adolescents in the United States. ■

Influenza Vaccine Rates Poor Among High-Risk Adolescents

BY DOUG BRUNK
San Diego Bureau

SAN DIEGO — The number of adolescents with asthma and other high-risk conditions who received the influenza vaccine increased between 1992 and 2002, but the coverage remains poor at about 15% overall, results from a large HMO study showed.

"About 85% of these kids who should have been getting the vaccine weren't getting it," Dr. Mari M. Nakamura said in an interview during a poster session at the annual meeting of the Infectious Diseases Society of America. "A risk-based approach to vaccination isn't working in this population. Universal vaccination in this age group may be warranted instead."

She and her mentor, Dr. Grace M. Lee, reviewed the medical records of 18,703 patients aged 11-17 years with high-risk conditions who were enrolled in Harvard Pilgrim Health Care for at least one influenza season and the preceding 1-year period, from 1992 to 2002.

High-risk conditions were indicated by ICD-9 diagnoses, and included asthma or other chronic pulmonary disease, chronic cardiac disease, immunosuppressive disorders or therapy, sickle cell anemia or other hemoglobinopathy, chronic renal dysfunction, or chronic metabolic disease.

"The burden of influenza is especially high in children and adolescents with high-risk conditions, accounting for excess hospitalizations, outpatient visits, and antibiotic courses," the researchers wrote.

They evaluated the changes in influenza vaccination rates over the time period, as well as the number of missed opportunities for vaccination (defined as office visits during the first 4 months of influenza season at which an unvaccinated adolescent was not vaccinated).

The mean age of patients was 14 years, and 48% were female, reported Dr. Nakamura, a Harvard pediatric health services research fellow at Children's Hospital Boston. The majority of patients (90%) had asthma or other chronic pulmonary disease, whereas 2% had more than one high-risk condition.

Influenza vaccination rates improved significantly from 1992 to 1993 (from 8.3% to 12.8%), and then again from 1993 to 2002 (from 12.8% to 15.4%).

The researchers also noted that between 1992 and 2002, about half of all unvaccinated patients had at least one missed opportunity for vaccination.

"The main reasons that they came in included preventive care and the need for other vaccinations," she said. "This tells us that providers are a group to target, to remind them that these patients should be getting flu vaccine every year."

The study was funded by Harvard Pilgrim Health Care and by the Agency for Healthcare Research and Quality. The researchers disclosed that they had no conflicts of interest. ■

HPV Vaccine in Pregnancy No Longer Contraindicated

BY BETSY BATES
Los Angeles Bureau

SAN DIEGO — The human papillomavirus vaccine, although still not recommended for use in pregnancy, is no longer listed as contraindicated by the Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices.

"This may lessen the concern when a woman inadvertently receives a dose before learning she is pregnant," Dr. Hal Lawrence said at Perspectives in Women's Health sponsored by FAMILY PRACTICE NEWS, OB.GYN. NEWS, and INTERNAL MEDICINE NEWS.

"Given time and more data, multiple doses of the vaccine may prove to be safe during pregnancy, offering clinicians an opportunity to initiate or complete the three-dose series during a period of routine office visits," added Dr. Lawrence, vice president for practice activities, American College of Obstetricians and Gynecologists.

For now, however, neither intentional initiation of the vaccine series nor delivery of doses two and three during pregnancy is recommended, according to updated information available from the CDC's Guidelines for Vaccinating Pregnant Women, available at www.cdc.gov/vaccines/pubs/pre-guide.htm.

The HPV vaccine contains neither live nor attenuated viral particles; instead, it contains particles engineered to resemble the L1 protein on the virus's outer capsule.

Although it provokes a robust immune response, "it does not have any actual viral activity," said Dr. Lawrence. To date no adverse events related to the mother or the developing fetus have been associated with administering the vaccine during pregnancy.

In an interview, Dr. Lawrence emphasized that the data are limited. "What we are really saying is that while no adverse events have been reported, there is not enough information to recommend HPV vaccination in pregnancy," he said.

Dr. Lawrence said that clinicians with patients who received the HPV vaccine during pregnancy are encouraged to call the HPV Vaccine Pregnancy Registry at 800-986-8999 to add to the information base. As HPV vaccinations during pregnancy are identified and pregnancy outcomes are tracked, the CDC and other organizations may reevaluate use of the vaccine during pregnancy.

In other news regarding HPV vaccines, Dr. Lawrence cited recent data showing partial blocking of 10 additional HPV strains, in addition to HPV 6, 11, 16, and 18, the four covered by the quadrivalent vaccine. "This may boost protection [against cervical cancer] to 90%," he said.

HPV is also responsible for the majority of anal and vulvar cancers in young women and for head, neck, and oral cancers, any of which could potentially be prevented with the HPV vaccine, he said.

OB.GYN. NEWS, FAMILY PRACTICE NEWS, and INTERNAL MEDICINE NEWS are published by the International Medical News Group, a division of Elsevier. ■