

Intranasal Flu Vaccine Found Effective in Children

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A single dose of trivalent live attenuated intranasal influenza vaccine administered to children during a 2003-2004 influenza outbreak was well tolerated and efficacious despite antigenic differences in the vaccine strain and the dominant circulating virus, researchers reported.

This finding from an open-label, non-randomized, community-based trial in children aged 5-18 years suggests trivalent live attenuated influenza vaccine (LAIV-T) protects against influenza via both innate and adaptive immune mechanisms, Dr. Pedro A. Piedra of Baylor College of Medicine, Houston, and his colleagues hypothesized.

Between Oct. 10 and Dec. 30, 2003—the first year the vaccine was licensed for use in the United States in healthy 5- to 49-year-olds—one dose of LAIV-T was administered by nasal spray to 6,569 age-eligible, healthy children, and one dose of trivalent inactivated influenza vaccine was administered by intramuscular injection to 1,040 children with underlying health conditions that increased influenza risks. A second vaccine dose was offered 4-6 weeks later in those under age 9 years receiving the vaccine for the first time, but most did not receive a second dose.

The vaccines were administered as part of a vaccination campaign that resulted in coverage of more than 30% in those aged 5-18 years in the intervention communities, the investigators noted (*Pediatrics* 2007; 120:e553-64; doi 10.1542/peds.2006-2836).

The influenza outbreak, which arrived early that year and coincided with the campaign, allowed investigators to evaluate both direct and indirect effectiveness of vaccination of school-age children during an outbreak. In addition, the dominant influenza virus during that outbreak was a significant antigenic variant—A/Fujian/411/2002 (H3N2)—that was distinct from the vaccine virus—A/Panama/2007/99 (H3N2).

Surveillance in the intervention communities and nearby comparison communities showed that live vaccine recipients developed significant protection against influenza-positive illness (37% vaccine effectiveness) and pneumonia and influenza events (50% overall vaccine effectiveness, 80% effectiveness in those aged 5-9 years).

Those who received the inactivated vaccine did not develop protection, but a number of possible causes for this are outlined, including the fact that most of the children were unable to receive the second vaccine dose during the outbreak period, and because the intervention and reference groups were not particularly well matched.

Furthermore, indirect effectiveness (herd protection) against medically attended acute respiratory illness was noted in nonparticipating children ages 5-11 years (13% reduction in events), and in nonparticipating adults ages 35-44 years (9% reduction in events). Such herd protection resulting from the vaccination of school-age children has been demonstrated in other studies, and is the basis for current consideration of universal influenza vaccination of

school-age children as a complementary strategy to that currently advocated by the Advisory Committee on Immunization Prevention (ACIP) of the Centers for Disease Control and Prevention, Dr. Piedra and his colleagues noted.

The current strategy of vaccine prioritization based on risk for serious influenza-associated complications has resulted in a modest reduction in influenza-related morbidity and mortality, but has failed to control epidemics, they explained.

The investigators added that mathematical models and prior studies suggest that universal vaccination of school-age children—who have high rates of infection, medically attended illness, and hospitalization from influenza, and who “play an important role in the transmission of influenza within families, schools, and communities”—could play an important role in reducing overall influenza-related morbidity and mortality.

In the current study, herd protection

was demonstrated in older individuals, who can be particularly susceptible to morbidity and mortality associated with influenza. However, this finding may have been biased by the significantly lower rates of medically attended acute respiratory illness in this population both before and after vaccination in the intervention communities, which is suggestive of a healthier adult population in the intervention communities, Dr. Piedra and his associates noted. ■

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