Debate Continues Over Flu Vaccine Strategies

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The benefits of vaccinating the elderly population against influenza may be substantially less than previously thought, and concentrating immunization efforts on the younger population with high-risk conditions might result in better outcomes, according to two separate studies.

Alternatively, funneling the limited vaccine supply to school-aged children could result in indirect community-wide protection, another group suggests.

Although the Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices (ACIP) is currently finalizing new vaccination guidelines based on three tiers of priority (see related story on p. 1), debate continues among researchers worldwide over the best way to use the limited vaccine supply.

Vaccinating the Elderly

Even as ACIP's proposed new guidelines place the elderly population in the first tier of vaccination priorities, a study from the National Institutes of Health (NIH) challenges the assumption that vaccinating this population results in decreased influenza-related mortality (Arch. Intern. Med. 2005;165:265-72).

Increased vaccination rates among the elderly population (aged 65 and older) since before 1980 should theoretically have substantially decreased pneumonia and influenza mortality rates in this age group, reported Lone Simonsen, Ph.D., an epidemiologist at the NIH, and colleagues.

But the authors documented no change in the number of deaths attributable to influenza. They used a cyclical regression model to generate estimates of national influenza-related mortality for 33 influenza seasons between 1968 and 2001, adjusting for the increase in average age of the elderly population over this time period, as well as for the increased frequency of influenza A–dominant seasons in the 1990s.

"Our findings indicate that the mortality benefits of influenza vaccination may be substantially less than previously thought," they reported.

This difference between their findings and those of observational studies attributing as much as a 50% reduction in deaths among the elderly to influenza vaccination may be partly explained by a "hypothesis of disparity in vaccination: Very ill elderly people, whose fragile health would make them highly likely to die over the coming winter months, are less likely to be vaccinated during the autumn vaccination period," they noted. Thus, some or all of the reduction in mortality observed in some of these studies was "not attributable to vaccination, but rather to underlying differences between vaccinated and unvaccinated cohorts," they suggested.

Keiji Fukuda, M.D., an epidemiologist at the CDC, said the new study will not change ACIP's three-tiered priority guidelines for vaccination. The study's ability to draw conclusions about vaccination's effectiveness is "quite limited," because it did not directly compare illness and death in vaccinated and unvaccinated people.

The authors "did not say that vaccine doesn't work," he told this newspaper. "Based on these considerations, both CDC and NIH strongly believe that vaccination of the elderly must continue, even while we try to develop better ways to protect this most fragile and vulnerable of groups."

Vaccinating the Old and the Young

In contrast with the NIH study, a separate study published in the same issue of the journal documented substantial benefits to vaccinating both elderly people as well as younger individuals who are at high risk of complications from influenza (Arch. Intern. Med. 2005;165:274-80).

This case-control study nested within the larger Dutch Prevention of Influenza, Surveillance, and Management (PRISMA) study included 8,593 subjects, reported Eelko Hak, Ph.D., of University Medical Center Utrecht, the Netherlands, and colleagues.

The subjects were grouped into three categories: high-risk children and adolescents aged 6 months to 17 years; high-risk adults aged 18-64 years; and people aged 65 years and older.

The study was conducted during the 1999-2000 influenza A epidemic and the two following influenza seasons, in which influenza activity was very mild.

Under Dutch guidelines, high-risk medical conditions include chronic bronchitis, emphysema, asthma, and other respiratory diseases; acute or chronic ischemic heart disease, heart failure, atrial fibrillation, and other heart disease; cerebrovascular disease; diabetes mellitus; chronic renal disease; chronic staphylococcal infection; and immune-related diseases.

Among the 411 high-risk children and adolescents, 58% (240) had been vaccinated against influenza, as had 70% of the 1,778 high-risk adults (1,246), and 81% of the 6,404 elderly people (5,197).

The study identified 1,920 patients who experienced 2,095 episodes of influenza. There were 320 deaths, 192 hospitalizations, and 1,583 GP visits.

Using incidence rates among unvaccinated subjects during the 1999-2000 influenza A epidemic and adjusting for age, gender, comorbidities, and health insurance coverage, the authors calculated the protective effect of vaccination in the cohort.

They found that among high-risk children, vaccination prevented 43% of GP visits for influenza, pneumonia, acute exacerbations of chronic lung disease, and acute otitis media.

Additionally, vaccination prevented 78% of deaths, 87% of hospitalizations, and 26% of GP visits among high-risk adults. And among elderly subjects, vaccination prevented 50% of deaths and 48% of hospitalizations.

"The results of our study lend strong support for the view that all high-risk persons benefit from annual influenza vaccination, regardless of age," the authors said.

Vaccinating Children

But with such low vaccination rates in high-risk populations, vaccination strategies should be reconsidered, according to a commentary published in a separate journal (Am. J. Epidemiol. 2005;161:303-6).

Targeting school-aged children—the group most responsible for community-wide transmission—while maintaining immunization in high-risk and elderly individuals could greatly curtail the spread of influenza in the general population, according to Ira M. Longini Jr., Ph.D., and M. Elizabeth Halloran, M.D., of Emory University in Atlanta.

Mathematical models and evidence from community trials suggest that by vaccinating school-aged children, transmission can be reduced in the entire community, they reported.

"The best strategy for minimizing the number of influenza deaths and morbidity … would be to concentrate vaccine in the high-risk and high-transmitting population groups simultaneously," they said. This could be achieved by targeting 70% of schoolchildren, as well as high-risk groups. ■