Booster vaccination may help with possible future avian influenza pandemic

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New evidence suggests that a booster vaccination against H5N1 avian influenza given years after initial vaccination with a different strain may prove useful in controlling a potential future pandemic. The study is published in the August 1 issue of The *Journal of Infectious Diseases,* now available online.

H5N1 continues to pose a major health risk to birds and humans. As of mid-June, more than 60 percent of the more than 380 human cases have been fatal, and hundreds of millions of birds have died or been culled to prevent the spread of the disease. Should the virus evolve making human-to-human transmission more likely, a destructive global influenza pandemic could result.

The cornerstone of planning for such a possible pandemic is the development and distribution of effective vaccines. Several vaccines have been developed, but as the virus continues to mutate into genetically distinct lineages, or clades, the problem arises as to whether vaccines based on an older clade will be effective against newer versions. The new study is the first to report that giving one dose of a newer-clade vaccine to those who were vaccinated previously with older versions is more effective than giving only doses of the newer vaccine to unvaccinated subjects.

The study, conducted by Nega Ali Goji, MD, and colleagues from New York, Maryland, and Alabama, gave a single booster dose of a vaccine based on a clade 1 H5N1 virus circulating in Vietnam in 2004 to

subjects who eight years earlier had received two doses of a vaccine based on the original, clade 0 virus that appeared in Hong Kong in 1997. Sixty-four percent had a positive immune response, which compares favorably to the results of a previous study using two doses of the clade 1 Vietnam virus, in which only 43 percent of those vaccinated had a positive immune response.

The results not only support the booster technique, but also show that even though the virus had mutated since the initial vaccination, using it to boost an earlier vaccine is more effective than simply vaccinating subjects with the most current vaccine. These findings are important given the fact that influenza viruses are mutating constantly.

"These results suggest that one strategy for pandemic control could involve prevaccination of some segments of the population prior to the emergence of a pandemic so that effective protection could be achieved with a single dose schedule if and when a pandemic emerges," the authors wrote. "If the finding that priming can result in enhanced responses to single-dose vaccination schedules were confirmed, then pre-pandemic vaccination programs could be considered, especially in populations of first responders, health care workers, or the military. Such populations might then be able to be effectively and rapidly vaccinated with a single dose of a vaccine specific for an emerging pandemic if it were to occur."

In an accompanying editorial, Gregory A. Poland, MD, of the Mayo Clinic College of Medicine, noted that some are already looking to begin such prevaccination primers against H5N1 influenza. For example, Japan is planning to immunize health care workers starting in 2009, and the U.S. Department of Defense is offering a vaccine to those in high risk specialties.

Dr. Poland pointed out that new studies are needed to investigate

different types of vaccine administration, deal with vaccinations that prevent death but not infection and illness, search for more broadly cross-protective influenza vaccines, and collect data on the vaccination of those who are not healthy adults. Although, he said, "determining who should receive these vaccines, when, and in what order and under what circumstances deserves widespread debate," he agrees that the findings of the study are novel, as they "suggest that such a prime-boost strategy using vaccines derived from different H5 clades, separated by years, may be worthwhile, immunologically feasible, and safe."

Source: Infectious Diseases Society of America