Medical Xpress

Adjuvants improve immune response to H7N9 flu vaccine

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In a phase 2 trial that included nearly 1,000 adults, the AS03 and MF59 adjuvants (a component that improves immune response of inactivated influenza vaccines) increased the immune responses to two doses of an inactivated H7N9 influenza vaccine, with AS03-adjuvanted formulations inducing the highest amount of antibody response, according to a study in the July 21 issue of *JAMA*.

In March 2013 the first human infections with the avian influenza A(H7N9) virus were reported in China, and since that time hundreds of cases have been documented. While most infections are believed to result from exposure to infected poultry, the potential for viral adaptation that would facilitate person-to-person transmission is a major concern. Previous experience with an inactivated H7N7 influenza vaccine indicated that hemagglutinin (a substance on the outer coat of the influenza virus) H7 is poorly immunogenic, necessitating evaluation of adjuvanted H7N9 vaccines, according to background information in the article.

Lisa A. Jackson, M.D., M.P.H., of Group Health Research Institute, Seattle, and colleagues randomly assigned 980 adults (19 through 64 years or age) to receive the H7N9 vaccine on days 0 and 21 at doses of 3.75 µg, 7.5 µg, 15 µg, and 45 µg of hemagglutinin with or without AS03 or MF59 adjuvant. The study was conducted at 5 U.S. sites from September 2013 through November 2013; safety follow-up was completed in January 2015.

Two doses of vaccine were required to induce detectable antibody titers in most participants. After 2 doses of an H7N9 formulation containing 15 µg of hemagglutinin given without adjuvant, with AS03 adjuvant, or with MF59 adjuvant, the proportion achieving an hemagglutination inhibition antibody (HIA) titer of 40 or higher was 2 percent without adjuvant (n = 94), 84 percent with AS03 adjuvant (n = 96), and 57 percent with MF59 adjuvant (n = 92).

The two schedules alternating AS03-and MF59-adjuvanted formulations led to lower geometric mean (average) titers (GMTs) than the group induced by two AS03-adjuvanted formulations but higher GMTs than two doses of MF59-adjuvanted formulation. Older age and prior administration of seasonal influenza vaccine were independently associated with a decreased antibody response.

"These results imply that, of the options currently available utilizing adjuvants included in the national stockpile, based on the immune response data, AS03 should be considered a first-line adjuvant for strategies incorporating an inactivated H7N9 vaccine in adults," the authors write.

"This study of 2 adjuvants used in influenza vaccine formulations with adjuvant mixed on site provides immunogenicity information that may be informative to influenza pandemic preparedness programs."

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