MedicalXpress

New study determines double flu jab needed against bird flu pandemic

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An international study led by University of Leicester researchers has determined that vaccination will be the best way to protect people in the event of the next influenza pandemic – but that each person would need two doses.

In an article in the *New England Journal of Medicine* published on October 9, researchers from the University of Leicester and University Hospitals of Leicester report on a study carried out at the Leicester Royal Infirmary.

Dr Iain Stephenson, Consultant in Infectious Diseases at the Infirmary and a Clinical Senior Lecturer at the University of Leicester carried out the research with Professor Karl Nicholson, Professor of Infectious Diseases at the University of Leicester and Consultant Physician at the Leicester Royal Infirmary.

The research was carried out in collaboration with Katja Hoschler, and Maria C. Zambon of the Health Protection Agency, Kathy Hancock, Joshua DeVos, Jacqueline M. Katz, from the Centers for Disease Control and Prevention, Atlanta, Michaela Praus and Angelika Banzhoff, from Novartis Vaccine, Germany. It is published in a letter to the *NEJM*.

An influenza pandemic occurs when a new influenza strain emerges (one to which humans have no immunity), mutates and spreads globally as a virus. Although it is not possible to predict the actual pandemic influenza strain, global health authorities have identified H5N1 avian influenza as

a strain with the greatest pandemic potential in humans. H5N1 is currently circulating in birds and has caused serious illness in more than 380 people worldwide with a mortality rate, among people known to have been infected, of greater than 60 percent.

Dr Stephenson said: "In the event of the next influenza pandemic, vaccination will be the best way to protect people. Because of manufacturing capacity constraints, vaccines ideally need to be as a low dose as possible so that limited antigen material can be optimally used.

"In addition, it generally takes two doses of vaccine to give a good response, so if a pandemic occurred it would take some time to produce vaccine and then administer 2 doses to protect people. Therefore stockpiling of vaccines has been suggested to overcome some of these difficulties. However, subjects will still require 2 doses to generate protection and if the pandemic spreads rapidly this could be challenging to deliver."

The Leicester study looks at boosting those people who were vaccinated up to 7 years ago in the first H5 vaccine trials conducted in Leicester with a new updated H5 vaccine, in comparison to vaccinating subjects for the first time.

"We have found that a single low dose booster vaccine, given 7 years later, generated a very rapid response and within 1 week of vaccination, over 80% subjects had an excellent response to all strains of the H5 virus. In comparison, the unprimed subjects who were vaccinated for the first time needed two doses of vaccine and achieved protective levels of antibody after 6 weeks as expected.

The results indicate that regardless of which avian strain individuals are originally primed with, they are quickly protected against a broad range of avian strains following their booster vaccine, even strains they were

not initially inoculated against. These results potentially provide a rationale to prevent pandemic influenza by proactively immunizing the public with stockpiled pre-pandemic vaccines.

"Therefore the importance of this study is to help policy makers decide how to use the stockpiled vaccine. We find that proactively priming subjects (such as key personnel and first responders) to generate long lived memory immune responses that could be boosted rapidly many years later could be used as a potential vaccination strategy."

Source: University of Leicester