Researchers unlock secrets of 1918 flu pandemic

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WASHINGTON (Reuters) - Researchers have found out what made the 1918 flu pandemic so deadly -- a group of three genes that lets the virus invade the lungs and cause pneumonia.

They mixed samples of the 1918 influenza strain with modern seasonal flu viruses to find the three genes and said their study might help in the development of new flu drugs.

The discovery, published in Tuesday's issue of the Proceedings of the National Academy of Sciences, could also point to mutations that might turn ordinary flu into a dangerous pandemic strain.

Yoshihiro Kawaoka of the University of Wisconsin and colleagues at the Universities of Kobe and Tokyo in Japan used ferrets, which develop flu in ways very similar to humans.

Usually flu causes an upper respiratory infection affecting the nose and throat, as well as so-called systemic illness causing fever, muscle aches and weakness.

But some people become seriously ill and develop pneumonia. Sometimes bacteria cause the pneumonia and sometimes flu does it directly.

During pandemics, such as in 1918, a new and more dangerous flu strain emerges.

"The 1918 influenza pandemic was the most devastating outbreak of infectious disease in human history, accounting for about 50 million deaths worldwide," Kawaoka's team wrote.

It killed 2.5 percent of victims, compared to fewer than 1 percent during most annual flu epidemics. Autopsies showed many of the victims, often otherwise healthy young adults, died of severe pneumonia.

"We wanted to know why the 1918 flu caused severe pneumonia," Kawaoka said in a statement.

They painstakingly substituted single genes from the 1918 virus into modern flu viruses and, one after another, they acted like garden-variety flu, infecting only the upper respiratory tract.
But a complex of three genes helped to make the virus live and reproduce deep in the lungs.

The three genes -- called PA, PB1, and PB2 -- along with a 1918 version of the nucleoprotein or NP gene, made modern seasonal flu kill ferrets in much the same way as the original 1918 flu, Kawaoka's team found.

Most flu experts agree that a pandemic of influenza will almost certainly strike again. No one knows when or what strain it will be but one big suspect now is the H5N1 avian influenza virus.

H5N1 is circulating among poultry in Asia, Europe and parts of Africa. It rarely affects humans but has killed 247 of the 391 people infected since 2003.

A few mutations would make it into a pandemic strain that could kill millions globally within a few months.

Four licensed drugs can fight flu but the viruses regularly mutate into resistant forms -- just as bacteria evolve into forms that evade antibiotics.

(Reporting by Maggie Fox, editing by Will Dunham and John O'Callaghan)