MedicalXpress

Flu is transmitted before symptoms appear, study suggests

August 29 2012

Research at Imperial College London examining influenza transmission in ferrets suggests that the virus can be passed on before the appearance of symptoms. If the finding applies to humans, it means that people pass on flu to others before they know they're infected, making it very difficult to contain epidemics.

The research was supported by the National Institute for Health Research (NIHR) Imperial Biomedical Research Centre.

Knowing if people are infectious before they have symptoms is important to help authorities plan for an epidemic, but is has been difficult to establish this from data collected during outbreaks. Previous research using mathematical models estimated that most flu transmission occurs after the onset of symptoms, but some happens earlier.

The new study, published in the open access journal PLOS ONE, is the first to investigate this question experimentally in an animal model. Ferrets are commonly used in flu research because they are susceptible to the same virus strains and show similar symptoms to humans.

Ferrets with flu were put in contact with uninfected ferrets for short periods at different stages after infection. Transmission occurred before the first symptom, fever, appeared, both when the ferrets were in the same cage and when they were in adjacent cages.

Professor Wendy Barclay, the study's lead author from the Department

of Medicine at Imperial College London, said: "This result has important implications for pandemic planning strategies. It means that the spread of flu is very difficult to control, even with self-diagnosis and measures such as temperature screens at airports. It also means that doctors and nurses who don't get the flu jab are putting their patients at risk because they might pass on an infection when they don't know they're infected."

The flu strain used in the study was from the 2009 swine flu pandemic, which killed almost 300,000 people worldwide.

The researchers found that ferrets were able to pass on flu to others just 24 hours after becoming infected themselves. The animals did not suffer from fever until 45 hours after infection and began sneezing after 48 hours. The results are consistent with earlier studies which found that sneezing is not necessary to transmit flu – droplets of virus are expelled into the air during normal breathing.

In the late stages of infection, after five or six days, flu was transmitted much less frequently, suggesting that people can return to work or school soon after symptoms subside with little risk of passing flu on to others.

The first author, Dr Kim Roberts, who is now based at Trinity College Dublin, said: "Ferrets are the best model available for studying flu transmission, but we have to be cautious about interpreting the results in humans. We only used a small number of animals in the study, so we can't say what proportion of transmission happens before symptoms occur. It probably varies depending on the flu strain."

More information: KL Roberts et al. Transmission of a 2009 H1N1 pandemic influenza virus occurs before fever is detected, in the ferret model. *PLOS ONE*, 29 August 2012. dx.plos.org/10.1371/journal.pone.0043303

Provided by Imperial College London