ECDC Threat Assessment

Reassortment seasonal influenza virus and swine influenza virus

in Saskatchewan, Canada

9 July 2009

SOURCE AND DATE OF REQUEST: ECDC internal decision, 8 July 2009

PUBLIC HEALTH ISSUE: New strain of swine influenza identified in two workers on a pig farm in Canada.

CONSULTED EXPERTS:

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DISEASE BACKGROUND INFORMATION GENERAL

Animal infection and disease

Swine influenza (SI) is an acute viral infection of the respiratory tract in pigs. Subclinical infections are also common. The mortality is low and recovery usually occurs within 7-10 days [1]. A typical swine flu outbreak is usually characterized by respiratory signs, fever, loss of appetite, laboured abdominal breathing and coughing but there can also be inapparent outbreaks [1]. In Europe, infection is common in many countries [2] but it is not a notifiable disease in the European Union (hence there are no routine EU data available). Influenza viruses in pigs have been detected for many years and circulating subtypes include H1N1, H3N2, and H1N2 [3]. The origin and nature of swine-like influenza viruses differ somewhat between Europe and North America [1]. Swine origin influenza viruses also occur in wild birds, poultry, horses and humans, but interspecies transmission is considered a rare event [3].

Human infection and disease

The current pandemic of Influenza A(H1N1)v is of a virus with significant amounts of genetic material from swine influenza though it is now functionally a human influenza virus in terms of transmitting freely from human to human [4].*

Zoonotic infection with swine influenza virus has been detected occasionally in humans since the 1950s and the human disease is usually clinically similar to disease caused by infections with human influenza viruses [5-9]. Complications that include pneumonia and death have been reported in the literature in otherwise healthy adults without underlying disease [1]. Single generation person to person transmission has been reported but appears to be rare and chains of transmission have not been observed. Serological surveys undertaken in North America among persons working with pigs have shown that they quite often have evidence of prior infection with swine influenza viruses [9,11]. But interpretation of sero-prevalence data can be difficult due to cross-reactivity (i.e. infection with an ordinary influenza virus might be misinterpreted as indicating prior swine influenza infection). There are no contemporary serological data from humans for Europe.

EVENT BACKGROUND INFORMATION

Event reported by the Public Health Agency of Canada on 7 July 2009:

- A new strain of influenza was detected in two workers on a pig farm in Saskatchewan, Canada [12]. These two workers suffered only mild illness and have both fully recovered. Further investigations are ongoing including on a third possible case. It is significant that the two cases, as well as the case under investigation, had onset dates and time that occurred within a 24 hour period. This makes swine to human transmission far more likely than human to human.
- This strain is a reassortment between a seasonal influenza strain and a swine influenza virus. It contains HA and NA genes from current human seasonal influenza H1N1 and the other 6 genes from the North American triple reassortment swine influenza A viruses. The human H1N1 genes includes the H275Y marker for oseltamivir resistance which is in the current dominant circulating seasonal A(H1N1) strain in North America.
- Further epidemiological and virological investigations are underway in Canada but there are no sign of any other cases.
- This event is not related to the current pandemic influenza A(H1N1)v virus.

ECDC THREAT ASSESSMENT FOR THE EU

Sporadic human infection with swine influenza virus has been documented in the literature with cases mostly confined to persons that have occupational exposure to pigs. For this reason, some scientists advocate to recommend seasonal influenza vaccination

* The European Commission recently held a meeting on the issues that arise at the animal health interface for the new pandemic virus. Reports of the Commission meeting appear at the following three links **Background document**, **Agenda and presentations** and **Conclusions of the meeting**.

campaigns to persons working with pigs in order to reduce the risk of reassortant viruses emerging [12, 13].

While avian influenza genes are considered an important factor in the emergence of a human pandemic influenza strain, pigs continue to be considered a potential “mixing vessel” for influenza viruses from avian and human origin, thereby potentially leading to new influenza viruses [6, 14].

In this event, we do not know where this reassortment took place: it might be in human or in pigs. Further investigations may provide more information about the source of this new strain.

Short chains of human to human transmission certainly occurs and has been recorded in other events of swine influenza transmission to humans in Europe and the United States [6][7]. That does not seem to have happened here.

CONCLUSIONS AND RECOMMENDATIONS

- While there is no definitive evidence either way, the current assumption of the Canadian authorities is that this incident is pig to human transmission since both cases and a suspected third case had onset of symptoms within 24 hours of each other and therefore unlikely to be due to one person infecting the other.
- These two cases are sporadic cases of human infection with reassorted virus strain. Such infections with swine influenza viruses can be expected occasionally in persons occupationally exposed to pigs as is the case here. These infections are probably under-recognised generally.
- European countries can expect similar events in the future. The risk to humans of swine influenza virus in Europe is an area deserving further surveillance and study [6,15].
- We do not have information regarding the risk for further human to human transmission of swine influenza viruses in Europe in the light of this case.
- Further information on the virus is needed and investigation under way in Canada should indicate whether human to human transmission can be ruled out.
- Conventional protective measures are being undertaken by the health authorities in Canada for those possibly exposed but including offering seasonal influenza vaccine to those working with the herd of pigs.

This Threat Assessment is based on the information available on 9 July 2009, 15h00CEST. A new threat assessment will be published in case further information become available.

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