Update on Avian Influenza

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Possible human to human transmission in China

An article in *The Lancet*, March 2008 states that a family cluster of confirmed cases of the highly pathogenic avian influenza virus H5N1 was possibly due to human to human transmission. Genetic sequencing confirmed the likelihood that a 24 year old who died of bird flu passed the virus directly to his father who was taking care of him while he was in hospital. The father recovered and was given Oseltamivir, Rimantadine as well as a serum from a woman who was inoculated with an experimental H5N1 vaccine.

According to WHO, the H5N1 virus has already killed 234 people out of 376 in 12 countries. since 2003. Most were due to direct infection by sick birds but in a few rare cases it appears that there was human to human transmission. This occurred among genetically related persons.

Factors favouring the continuous reoccurrence of the H5NI virus

Statistical risk modelling was carried out in Thailand and Vietnam to analyse the statistical association between the presence of H5N1 virus and 5 key environmental variables comprising altitude, human population, chicken numbers, duck numbers and rice cropping intensity, and consistent patterns emerged suggesting that the risk is associated with duck abundance, human population and rice cropping intensity.

Avian influenza H5N1 virus in mosquitoes collected from a Thai poultry farm

A paper published in last March's issue of *Vector-borne and Zoonotic Diseases* showed that mosquitoes collected from a poultry farm during an outbreak of H5N1, tested positive for the virus using Reverse Transcriptase-PCR.

Arthropod vectors were never previously implicated in the epidemiology and transmission of avian influenza viruses and this now leaves open the question whether the virus surviving in the insect vector will be competent in vertebrate cells and in a form that may be infectious to live susceptible poultry and/or mammals.

International symposium reports on the use of antivirals in patients with H5N1

Physicians' reports during last March's International Symposium on Respiratory Viral Infections in Singapore, support the approval of Tamiflu for both treatment and post exposure prevention of influenza in adults and children over 1 year of age. However the magnitude of effect of Tamiflu in treating and preventing novel strains of influenza cannot be predicted as it has not been studied.

The WHO has recommended that higher doses and longer treatment durations may be required to combat novel strains of influenza. In the most recent clinical management guidelines issued by the WHO, Tamiflu remains the primary antiviral agent of choice for the treatment of H5N1 virus infections.

Interesting Symposium findings

In Indonesia, out of 119 reported H5N1 human cases, 22 survived - an 18% survival rate. Of the 119 cases, 33 patients received no Tamiflu, all of whom died. Tamiflu was administered to the other 86 patients, with a 26% survival rate. Time from onset of illness to initiation of treatment appeared to influence survival. The 2 patients who received Tamiflu within 24 hours of illness onset survived.

When the drug was given within 4 days, 55% survived, and 35% survived when given Tamiflu within 6 days. The survival rate of those receiving it later than 6 days after illness onset was 18%.

Information about 8 Vietnamese patients infected with H5N1 was also presented. All 8 patients received Tamiflu, but all of them were admitted to hospital later than 5 days after onset of illness. Only 3 of the 8 patients survived, reinforcing the hypothesis that treatment benefit is reduced for patients that receive the drug later in the course of illness. In 2 patients who were unable to take the drug orally due to the severity of their illness, physicians administered the drug by nasogastric tube and found that it was well absorbed and there was a reduction in the patients' viral load.

Susceptibility of circulating H5N1 strains to Tamiflu

Clinical findings supported by animal data, also presented at the symposium, showed that oseltamivir treatment was effective against H5N1 influenza viruses representing different clades/subclades.

Data also confirmed the low level of resistance reported to date with Tamiflu to H5N1, as there were only 5 cases of published reports of H5N1 resistance or reduced susceptibility.

This compares to the 14% of the seasonal influenza A H1N1 virus isolates tested this year showing resistance to Tamiflu. It is important to note that these increased levels of resistance have only been reported in this year's H1N1 (Solomon Islands) seasonal strain and not in patients infected with H5N1 who were administered Tamiflu.

Complete change of flu vaccine strains for the northern Hemisphere

This is the first time in 20 years that the trivalent vaccine will be completely changed in a single year for 2008-2009 Northern hemisphere season. The current H3N2 will be changed to the Brisbance/10 strain currently circulating in the USA. Nevertheless, manufacturers are concerned that with 3 new strains, delays will occur, hindering the delivery of the vaccine in time for the start of the season.

US panel recommends wider paediatric use of influenza vaccines

The US Centre for Disease Control and Prevention's Advisory Committee on Immunization Practices has recommended that current immunization guidelines should be extended to include all children aged 18 months to 18 years. The panel recommends that this measure should be adopted as soon as possible.