

Swine Influenza

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Nature of the disease

Swine influenza (SI) is a virus disease that can cause epidemics of acute respiratory disease in pigs. The disease is due to viruses from the type A of the Orthomyxoviridae family, (there are three types of Orthomyxoviridae, A, B and C). Etiology of SI is complex according to the high genetic variation of the causative viruses, mainly on two glycoprotein : hemagglutin (H) and neuramidase (N). A nomenclature for virus designation has been established by WHO in 1980.

The disease causes high morbidity but low mortality. It can also persist as an endemic infection and is a potential zoonosis.

Classification

SPC List D disease, WHO surveyed disease

Susceptible species

Pigs are the main host. However, strains of swine influenza virus can also be directly transmissible to humans, and reciprocally. SI was responsible for the human outbreak in 1918-20 that killed more than 20 million people over the world (Spanish flu). A recent strain has also been responsible for an outbreak in 1976.

There is increasing evidence of interchange of influenza viruses between pigs, other mammalian (including marine mammals) and avian hosts, either directly or after a process of genetic reassortment or mutation.

Distribution

Epidemics of swine influenza occur fairly regularly each winter in North America and Europe. Outbreaks have also been reported in many other parts of the world, including South Africa, Kenya, India, China, Hong Kong, Japan, Singapore and South America.

Clinical signs

There is a very high morbidity rate and most pigs in a herd get the disease almost simultaneously. Outbreaks typically occur colder months but in some cases SI remains endemic. Young pigs are more severely affected.

The first signs are:

Then there is a sudden onset of acute respiratory signs:

Most pigs recover about six days after the onset of the disease. The mortality rate is generally about 1%, but may be higher in young piglets. SI can precipitate outbreak of more serious respiratory disease causing mortality.

In humans the disease is much more severe causing viral pneumonia that is often fatal.

Post-mortem findings

The lesions are confined to the respiratory system and are not very specific.

Differential diagnosis

The following diseases must be considered in the differential diagnosis:

Specimens required for diagnosis

Although the presumptive diagnosis can be based on clinic and epidemiology it is preferable to address samples to reference laboratories.

Identification of the virus can be done by many techniques including immunohistochemical detection, hemagglutination-inhibition coupled to neuramidase inhibition, ELISA and PCR, sometimes several techniques must be combined to identify (H) and (N) subtypes. Identification tests can be performed from nasal (preferably) or pharyngeal swabs from live animals. Samples must be suspended in glycerol saline and kept at 4°C if they are tested within 48 hours and at 70°C, shipped with dry ice if they are tested after a longer delay. Alternatively lungs from spontaneously dead or sacrificed animals can be sent under similar conditions.

For serology, blood samples (about 20 ml each) should be collected from pigs that are in the acute and convalescent stages of the disease (2 to 3 weeks later). Tests are made by hemagglutination inhibition and demonstrate a raise in the antibody level. The interpretation of serological results may be complicated in young pigs because of the persistence of maternal antibodies.

Transmission

Swine influenza is transmitted by direct contact between pigs. In the acute stages of the disease, high concentrations of virus are found in nasal secretions. Virus is transmitted by aerosols over a short distance. The virus can be shed for 30 days after infection and has been recovered from clinically normal animals.

The disease is spread to new areas and farms by the movement of infected pigs or carrier people.

The virus is easily carried and spread by avian species, particularly waterfowl and turkeys. Outbreak of Asian subtypes of influenza A may involve duck to pig transmission since these animals are traditionally kept together. Care should be taken to prevent spread from and between birds and humans to swine.

In endemic areas, while virus is present throughout the year, outbreaks are seasonal, tending to occur in late autumn and early winter.

Epidemics are often explosive, with outbreaks occurring on most pig farms in a locality over a short period.

Risk of introduction

Swine fever is most likely to be introduced through importation of infected pigs. These animals should be screened by serology to determine if they have been exposed to swine influenza.

Note that infection from humans to pigs is also possible.

Control / vaccines

The best way to deal with swine influenza is to prevent the occurrence and spread of the disease.

Where the disease does occur, the primary treatment is supportive therapy. Infected pigs require a dry, clean, dust free environment. Antibiotics are also essential to treat and control any secondary bacterial infections that usually develop. Expectorants are commonly used as a herd treatment and are administered in the drinking water.

Commercial vaccines are available in Europe and North America. Results from various studies show that vaccinated animal exposed to swine influenza virus have markedly reduced nasal shedding, virus infection in lung tissue, and lung pathology compared to non-vaccinated animals. Studies have also shown that maternally derived antibody in vaccinated sows protected 5 week old pigs from clinical disease, virus infection in the lung, and lung pathology but did not prevent nasal viral shedding.

As the passage of swine influenza to humans is a serious threat if suspected, the disease should be diagnosed and notified to Public Health Department.

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