

SWINE FLU

Swine Influenza refers to influenza caused by any strain of influenza virus endemic in pigs (swine). These strains are called swine influenza virus SIV.

Swine Influenza is common in swine & rare in humans. People who work with swine, especially with intense exposure, are at risk of swine Influenza provided swine carry a strain able to infect humans. However, these strains rarely are able to pass from humans to human.

However rarely SIV mutates into a form able to pass easily from human to human. The strains responsible for the swine Influenza outbreak is believed to have undergone such a mutation. This virus is named swine Influenza because one of its surface proteins is similar to SIV virus that usually infect pigs, but this strain is spreading in people & it is unknown if it infects pigs.

In humans the symptoms of swine Influenza are similar to those of Influenza & of Influenza like illness in general.

The symptoms are fever, chills, sore throat, coughing, muscle pain, severe headache, weakness & general discomfort. However, the strain for 2009 swine Influenza outbreak in most cases causes only mild symptoms & the infected person recovers fully in few days.

Human flu are of 3 genera

--- Two endemic also in swine Influenza

---- Influenza virus A (common)

---- Influenza virus C (rare)

Influenza B has not been reported in swine. But within A & C virus, the strains endemic to swine & humans are largely distinct.

Background

The swine Influenza is a descendant to the infamous "Spanish Flu" which caused pandemic in human in 1918-19 & in less than a year about 2 crore people died world wide which is the greatest no. of people ever killed in such short period of times by natural or man made catastrophe. It was within a decade that the disease stopped circulating among humans but since then the swines are infected.

Although the swine had initially caught the virus from humans but it is undergone slight changes over the years mutation and this strain occasionally infect individuals who work closely with pigs but these one rare & therefore there is currently no requirement of raceimation to pigs against swine Influenza. The flu virus is tricky virus, it constantly changes form to elude the protective anti bodies that this body has developed in response to the previous exposure to Influenza virus or to Influenza vaccines. Every 2-3 years it under goes minor or changes & roughly a decade after the bulk of the world population has developed some level of resistance to these minor changes, it undergoes a major shift that enables to its tear off on yet another paramedic sweep around the world, infecting hundreds of million of people who suddenly find their antibody defenses outflanked.

Swine 19-19 Spanish flu parademic, the initial waves of the disease was relatively mild & second wave was highly lethal. In 1957 Asian Flu, 45 million people are infected & 70,000 died, 11 year later in 1968-69 the Hong Kong flu parademic afflicted 50 million people death was 38000, cost3.9 billion dollars. Since there are isolated cases from pigs.

Medical researches world wide are recognizing the swine flu virus might mutate again & deadly virus as deadly as Spanish flu might emerge & are watching its appearance in 2009 outbreak & are making contingency plan for possible global pandemic

Classification of virus

Influenza A virus –Swine Influenza is known to be caused influenza A subtype.H1N1, H1N2, H3N1, H3N2, H2N3.

In Swine Influenza i.e., virus A subtype.(H1N1,H1N2,H3N2)are circulating throughout the world, but prevalent was H1N1 , till 1998 but since Aug 1998,H3N2 subtype have been isolated from pigs.

Avian Influenza virus H3N2 is endemic pigs in China, Vietnam & increasing fears of emergence of a new variant strain. Health experts say pigs can carry human Influenza virus which can combine with H5N1, passing genes and mutating the form which can pass easily among humans. H3N2 evolved from H2N2 by antigenic shift. The H5N1 were found in pigs China in August 2004, which causes human influence.

Symptoms

Fever

Cough

Sore throat

Body ache

Fatigue

Chills.

In 2009 a high number of patients are reporting Diarrhea & vomiting also. Due to these non specific symptoms the sick person ,history of contact with confirmed case of swine flue was present or in that part of this world. Where there are cases of swine flu preceding their illness onset.

Confirmatory Test

Swab testing from throat or nasal sample

Pathophysiology

Influenza virus bind through haemagglutinin onto sialic acid sugars on the surface of epithelial cells especially of nose throat and lungs of mammals and intestines of birds.

Swine Flu in humans: People who work with poultry and swine, especially people with intense exposure are at risk of zoonotic infection with influenza virus endemic in these animals and such a reassortment can occur.

Transmission of influenza from swine to human, who work with swine, was documented in study in 2004 in USA.

Therefore it was recommended that people whose jobs involved handling of poultry and swine be focused on increased public health surveillance.

2009 swine flu influenza outbreak is a reassortment of several strains of influenza subtype H1N1 including strains endemic in humans and two strains endemic in pigs and avian influenza

Human to human transmission of swine flu is like that of seasonal flu through coughing, sneezing of infected people and also touching something with virus on it and touching then own nose or mouth.

Swine flue cannot be spread by pork products, Swine virus is not transmitted through food. The swine flu is most contagious during first 5 days of illness, although some people mostly children can remain contagious up to 10 days.

Diagnosis can be made by sending the specimen, collected during first 5 days to lab for analysis.

The swine flu is susceptible to 4 drugs.

- Amantadine
- Rimantadine
- Oseltamivir
- Zanamivir

In the 2009 strain, it is recommended to treat patient under medical advice with Oseltamivir & Zanamivir to avoid drug resistance. The vaccine for Human Seasonal H1 N1 virus does not protect against swine H1 N1 flu, the virus strain is same specific variety but are antigenically very different.

Prevention

1. Prevention Components in Swine
2. Prevention of Transmission to Humans
3. Prevention of spread amongst Humans

Prevention Components in Swine

Recently in this decade it has become a greater problem as evolution of the virus has resulted in inconsistent responses to traditional vaccines. Standard commercial swine flu vaccines are effective in controlling the infection when the virus strains match enough to have significant cross protection. Autogenous vaccines made from specific viruses isolated are created and used in more difficult cases.

Prevention of Transmission in Humans

Recommendation is to use standard infection control against influenza. This includes frequent washing of hands with soap and water or with alcohol based hand sanitizers, especially being out in public as influenza spreads in cough & sneezes, it is evident that little particles of viruses can linger on table tops, telephones & other surfaces can be transmitted by fingers to mouth, nose & eyes. Alcohol based gel or foam destroy the viruses & bacteria.

Vaccines against the H1 N1 strain in the 2009 human outbreak are being developed and could be available as early as June 2009.

Any one with flu like symptoms should stay away from work, public transfer & see a doctor.

Treatment oseltamivir or Zanamivir: With these antiviral drugs, the sick person feels better faster & prevents serious flu complications. They should be started within 2 days of sickness.

As preparedness keep supplies of food, boiled water, chlorine bleach as emergency water purifier & surface sanitizers.

Epidemiology

1. Pandemic in 2007 in Philippines
2. In 1918 flu pandemic in human by H1 N1 virus, swine to human or human to swine.
3. In 1976, In US - by swine virus as in pandemic of 1978.

A massive immunization was started and 25% of population was vaccinated. As some sr. citizens died on the day of immunization, it was greatly outray of media that the death occurred due to immunization without any fact verification, leaving to severe set back in control measures.

Even they were reports of Guillian Barre syndrome, a paralyzing neuromuscular disorder, affecting some people receiving swine flu immunization. But it is a rare side effect of influenza vaccine-incidence 1 per million vaccinations.

Public thus refused the trust in government operated health program. However by 1976 end 33% of people were immunized. Due to above immunization program was stopped on 16 Dec 1976. Overall 500 cases of Guillian Barre Syndrome resulted for vaccinations & 25 deaths occurred due to pulmonary complications

2009 Out Break

The new strains of influenza virus involved are a reassortment of several strains of influenza. A virus – subtype H1N1, which are separately endemic in humans & in swines.

The preliminary genetic characterization found that the haemagglutinin (HA) gene was similar to that of swine flu viruses in pigs since 1999.

But at the same time the Neuradiminase (NA) and matrix protein (M) genes resembled the European Swine flu isolates. The virus with this genetic make up was not found circulating in humans or in pigs.

The origin of new strain is unknown, One theory is that Asian and European strains travelled to Mexico in migratory birds or in people, and this combined with Mexican pig in factory farms before jumping over to farm workers.

The earliest human case was at Mexican pig farm, whose nearby neighbors had been complaining about the manure smell & flies. The farm worker was supposed to be suffering from ordinary influenza but lab testing revealed that he had contracted swine flu.

The original disease vector of the virus may have been flies multiplying in manure lagoons of pig forms. The American cases were found to be made up of genetic elements from four different flu viruses.

North American Swine Influenza virus
North American Avian Influenza virus
Human Influenza virus
Swine Influenza virus

Pigs are potential mixing vectors in which reassortment can occur between the influenza viruses of several species.

This new strains appears to be result of reassortment of human and swine influenza viruses. This virus undergoes antigenetic shift because their genome is spilt between 8 pieces of RNA.

These current strains of swine flu can adapt to humans and spread more efficiently than previously known swine H1 N1 strains.

In India surveillance at airports is enhanced & checked swine flu. Govt. has also issued travel advisory at a high level meeting of union health ministers of country & have advised the Indians to restrict visits abroad, particularly Mexico, US, Europe, Canada. Screening of foreigners who have entered India on the past 10 days.

Certain companies like Ranbaxy, Cipla, Hetero, and Netco Pharmaceuticals & Roche have been asked by government. & stock antiviral to tackle any emergency in the country.

Government has stocked 1 million tablets & plans to raise 10 million in next 15 days (Tami Flu). Nine airports are identified for screening foreign visitors among Delhi, Jaipur, Mumbai, Cochin & Goa. Leading to 20% fall in travel. In Mumbai airport authorities have been asked to provide 3 counters wed afternoon & then start screening of travelers.

Vaccines are available for pigs to prevent swine influenza and as of now no vaccine to protect humans from swine flu is there although CDC is formulating one seasonal influenza vaccine to protect against H3 N2 and not H1 N1 virus which is one spreading currently.