Title : Swine FLU – H1N1 (S-OIV)

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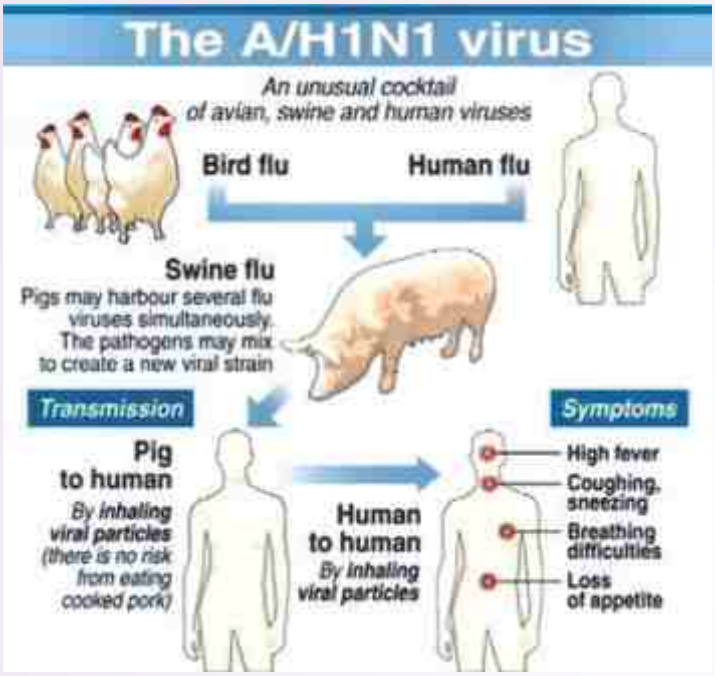


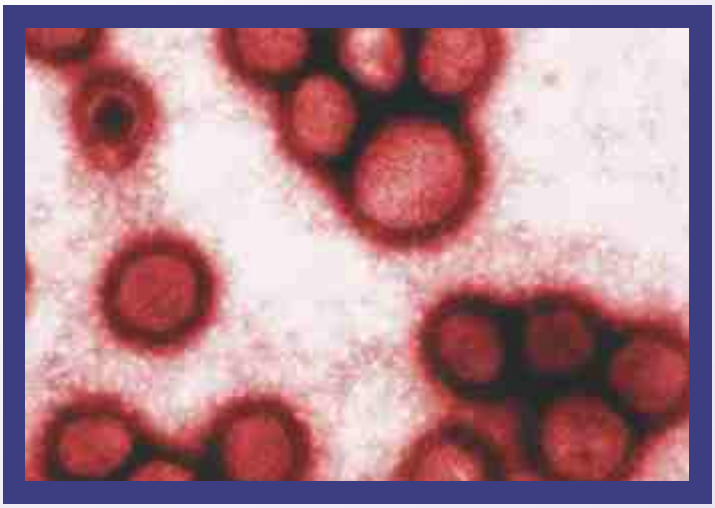
Fig no:1 Transmission of Swine flu in humans.

On April 17/2009, officials reported two cases of Swine flu in California and first case of swine flu in india was reported on Jan 18 /2010 .The series of evolutionary and epidemiologic events starting in 1918,that led to emergence of current swine – origin influenza A (H1N1) strain (S-OIV),which is widely known as Swine flu.

Before 1918, influenza was well described in human but it was never described in pigs earlier. In 1918, this pandemic killed almost 40- 50 million .The clinical presentation represented depicted as severe respiratory disease and search for causative agent began. The breakthrough came in 1931 when Robert Shope, a veterinarian, transmitted the infectious agent of swine flu from sick pigs, by filtering their virus containing secretions to healthy animals. He also discovered that antibody specificity against the 1918 human influenza rapidly diverged from that of swine flu virus. Analysis of full genome sequences of representative influenza A (H1N1) viruses from 17 countries and five continents were sampled between 1918 and 2006 that all eight segments of the virus had generally congruent patterns of evolution over time[2].

[Fig No: 2 Robert Shope, Founder of Antibody against Human Influenza]

The emergence of Influenza A (H1N1) 91 years led to a disastrous global pandemic. That virus is thought to have emerged almost simultaneously from bird into human and swine. In Contrast , S-OIV strain has emerged from swine to human. The History of influenza –A (H1N1) virus is punctuated by frequent, sporiadic cross- species transmission from swine to human.



[Fig no: 3: Microscopy picture of S-OIV strain]

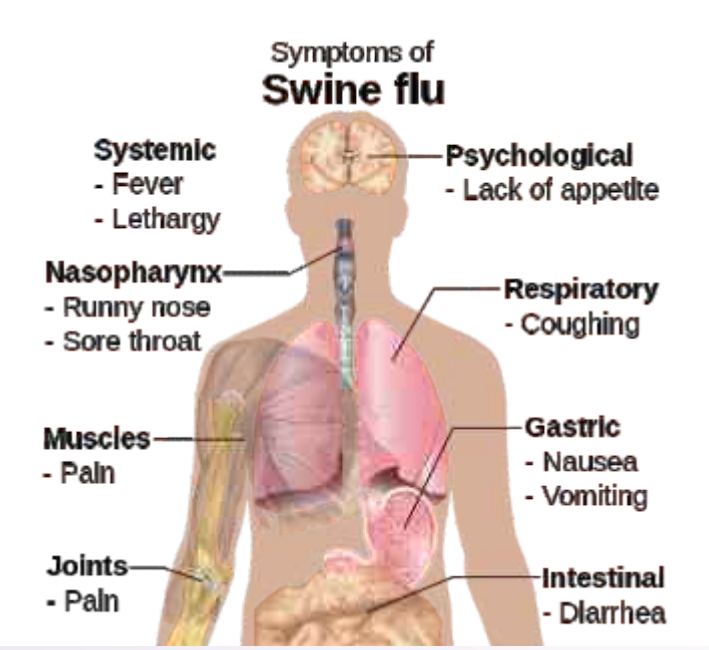
Signs and symptoms

Manifestations of H1N1 influenza are similar to those of seasonal influenza. Patients present with symptoms of acute respiratory illness, including at least 2 of the following:

- Fever
- Cough

- Sore throat
- Body aches
- Headache
- Chills and fatigue
- Diarrhea and vomiting (possible)

In children, signs of severe disease include apnea, tachypnea, dyspnea, cyanosis, dehydration, altered mental status, and extreme irritability. [3]



Diagnosis

- Onset of acute febrile respiratory illness within 7 days of close contact with a person who has a confirmed case of H1N1 influenza A virus infection.
- Onset of acute febrile respiratory illness within 7 days of travel to a community (within the United States or internationally) where one or more H1N1 influenza A cases have been confirmed.[4]
- Acute febrile respiratory illness in a person who resides in a community where at least one H1N1 influenza case has been confirmed.

Laboratory Diagnosis:

Outbreaks of H1N1 influenza (swine flu) are common in pigs year round. Historically, when humans have become infected, it is a result of close contact with infected pigs (but not consumption of pork). However, the current virus is a novel influenza A (H1N1) virus not previously identified in humans, and it appears to be spread by human-to-human transmission.

Clinicians should consider the possibility of H1N1 influenza virus infections in patients who present with febrile respiratory illness. The CDC criteria for suspected H1N1 influenza are as follows

- Onset of acute febrile respiratory illness within 7 days of close contact with a person who has a confirmed case of H1N1 influenza A virus infection, or
- Onset of acute febrile respiratory illness within 7 days of travel to a community (within the United States or internationally) where one or more H1N1 influenza A cases have been confirmed, or
- Acute febrile respiratory illness in a person who resides in a community where at least one H1N1 influenza case has been confirmed.
- In September 2011, Government developed test to diagnose seasonal flu as well as the flu viruses that could become pandemic. The Human Influenza Virus Real-Time RT-PCR Detection and Characterization Panel (rRT-PCR Flu Panel) is an in vitro laboratory diagnostic test that can provide results within 4 hours. It is the only in vitro diagnostic test for influenza that is cleared by the FDA for use with lower respiratory tract specimens and will be given at no cost to qualified international public health.[5]

The kit utilizes a 3-module design and can:

- Identify and distinguish between influenza A and B viruses,
- Classify influenza A viruses by subtype, and
- Detect highly pathogenic avian influenza A (H5N1) virus infection in human respiratory tract specimen

Management

Treatment is largely supportive and consists of

bedrest, increased fluid consumption, cough suppressants, antipyretics and analgesics (eg, acetaminophen, nonsteroidal anti-inflammatory drugs) for fever and myalgias. Severe cases may require intravenous hydration and other supportive measures. Antiviral agents may also be considered for treatment or prophylaxis.

Patients should be encouraged to stay home if they become ill, to avoid close contact with people who are sick, to wash their hands often, and to avoid touching their eyes, nose, and mouth. The WHO recommends the following actions when human infection with H1N1 influenza (swine flu) is confirmed in a community :

- Patients who develop flulike illness (i.e, fever with either cough or sore throat) should be strongly encouraged to self-isolate in their home for 7 days after the onset of illness or at least 24 hours after symptoms have resolved, whichever is longer.
- To seek medical care, patients should contact their health care providers to report illness (by telephone or other remote means) before seeking care at a clinic, physician's office, or hospital.
- Patients who have difficulty breathing or shortness of breath or who are believed to be severely ill should seek immediate medical attention.
- If the patient must go into the community (eg, to seek medical care), he or she should wear a face mask to reduce the risk of spreading the virus in the community when coughing, sneezing, talking, or breathing. If a face mask is unavailable, ill persons who need to go into the community should use tissues to cover their mouth and nose while coughing.
- While in home isolation, patients and other household members should be given infection control instructions, including frequent hand washing with soap and water. Use alcohol-based hand gels (containing at least 60% alcohol) when soap and water are not available and hands are not visibly dirty. Patients with H1N1 influenza should wear a face mask when within 6 feet of others at home.[6]

Medication Summary

Laboratory testing has found the H1N1 influenza A (swine flu) virus susceptible to the prescription antiviral drugs oseltamivir and zanamivir. Other antiviral agents (eg, amantadine, rimantadine) are not recommended because of recent resistance to other influenza strains documented over the past several years.

The usual vaccine for influenza administered at the beginning of the flu season is not effective for this viral strain. Also, other antiviral agents (eg, amantadine, rimantadine) are not recommended because of recent resistance to other influenza strains documented over the past several years.

Basic supportive care (ie, hydration, analgesics, cough suppressants) should be prescribed. Empiric antiviral treatment should be considered for confirmed, probable, or suspected cases of H1N1 influenza. Treatment of hospitalized patients and patients at higher risk for influenza complications should be prioritized

WHO guidelines : WHO guidelines recommend treating serious cases immediately. The guidelines represent an international panel of experts who reviewed all available studies regarding antiviral agents (with emphasis on oseltamivir and zanamivir). Evidence indicates that oseltamivir, when properly prescribed, significantly decreases risk of pneumonia (a leading cause of death for both pandemic and seasonal influenza) and the need for hospitalization.

For patients who initially present with severe illness or whose condition begins to deteriorate, initiate oseltamivir as soon as possible.

For patients with severe or deteriorating illness, treatment should be provided even if started later. Where oseltamivir is unavailable or cannot be used for any reason, zanamivir may be given. This recommendation applies to all patient groups, including pregnant women, and all age groups, including young children and infants[7].

For patients with underlying medical conditions that increase the risk of more severe disease, WHO recommends treatment with either oseltamivir or

zanamivir. These patients should also receive treatment as soon as possible after symptom onset, without waiting for the results of laboratory tests. Pregnant women are included among groups at increased risk, and WHO recommends that pregnant women receive antiviral treatment as soon as possible after symptom onset.

At the same time, the presence of underlying medical conditions will not reliably predict all or even most cases of severe illness. Worldwide, around 40% of severe cases are now occurring in previously healthy children and adults, usually younger than 50 years. Some of these patients experience a sudden and very rapid deterioration in their clinical condition, usually on day 5 or 6 following the onset of symptoms.

Clinical deterioration is characterized by primary viral pneumonia, which destroys the lung tissue and does not respond to antibiotics, and the failure of multiple organs, including the heart, kidneys, and liver. These patients require management in intensive care units using therapies in addition to antivirals.

Peramivir, an investigational, intravenous neuraminidase inhibitor in Phase 3 clinical trials, has been used successfully in adults and children under an emergency investigational new drug program in the United States. It was well tolerated and associated with recovery in the majority of patients hospitalized with severe H1N1 infection.

Prophylaxis with antiviral agents should also be considered in the following individuals (pre-exposure or postexposure):

- Close household contacts of a confirmed or suspected case who are at high risk for complications (eg, chronic medical conditions, persons >65 y or < 5 y, pregnant women)
- School children at high risk for complications who have been in close contact with a confirmed or suspected case.
- Travelers to Mexico who are at high risk for complications (eg, chronic medical conditions, persons >65 y or < 5 y, pregnant women)
- Health care providers or public health workers who were not using appropriate personal protective equipment during close contact with a confirmed or suspected case
- In September 2009, the CDC updated recommendations concerning the use of antiviral medications for prevention because of reported oseltamivir resistance; antivirals should not be used for postexposure chemoprophylaxis in healthy children or adults to manage outbreaks in the community, school, camp, or other settings.[8]
- Reserve antiviral chemoprophylaxis for persons at higher risk for influenza-related complications who have had contact with someone likely to have been infected with influenza.

Pre-exposure prophylaxis can be considered in the following persons:

- Any health care provider who is at high risk for complications (eg, persons with chronic medical conditions, adults >65 y, pregnant women)
- Individuals not considered to be at high risk but who are nonetheless traveling to Mexico, first responders, or border workers who are working in areas with confirmed cases
- Oseltamivir ring prophylaxis can be considered for outbreaks of pandemic H1N1 influenza A, especially among closed populations such as military personnel; ring prophylaxis involved the use of oseltamivir 75 mg once daily to members of the same military unit where contact opportunities were substantiaL

Mortality/Morbidity

H1N1 influenza (swine flu) tends to cause high morbidity but low mortality rates (1%-4%).

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