

## **SWINE FLU: A FIGHT AGAINST PANDEMIC**

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### **Summary**

The outbreak of the pandemic Swine Flu in early 2009 provided a major challenge to health services around the world and led to stockpiling of goods, the victimization of particular population groups, and the cancellation of travel and the boycotting of particular foods (e.g. pork). Swine flu is a highly contagious disease of pigs and infection by any one of several types of swine influenza virus. The direct transfer of the virus probably occurs either by pigs (touching noses, or through dried mucus) and close contact with infected people. Symptoms of swine flu are similar to most influenza infections: running nose, body aches, chills, fever (100°F or greater), cough, fatigue, and headache, myalgia, dyspnea with fatigue being reported in most infected individuals. The two major tests that are being used are the nasopharyngeal (or back of the throat) swab for viral culture, the gold standard, and the indirect evidence test by detection of antibodies to novel H1N1 with polymerase chain reaction(PCR) studies. Antiviral treatment with either zanamivir alone or with a combination of oseltamivir and either amantadine or rimantadine should be initiated as soon as possible after the onset of symptoms. There are two kinds of 2009 H1N1 vaccines being produced, A 2009 H1N1 “flu shot” and the 2009 H1N1 nasal spray flu vaccine. In present review paper, I have detailed the transmission, epidemiology, diagnosis, signs and symptoms, various possible treatment and its preventive measures.

**Key words:** Swine Flu, epidemiology, diagnosis, treatments, prevention. Pranayama and Meditation

### **Introduction**

Swine influenza (also called Pig influenza, swine flu, hog flu and pig flu) [1, 5] is an infectious disease caused by any virus belonging to the family Orthomyxoviridae, which is endemic in populations of pig. Swine influenza virus (SIV) or S-OIV (swine-origin influenza virus) is any strain of the influenza family of viruses that is endemic in 2009. The known S IV strains include influenza C and the subtypes of influenza A known as H1N1, H1N2, H3N1, H3N2 and H2N3 and an apparent birthplace Mexico and united states. Swine influenza is known to be caused by influenza-A subtypes H1N1, H1N2, H2N3, H3N1 and H3N2. In pigs, three influenza A virus subtypes (H1N1, H1N2 and H3N2) are the most common strains [6, 9].

Influenza viruses are divided scientifically into three types, designated A, B, and C. Influenza types A and B are responsible for epidemics of respiratory illness that occur almost every winter. Influenza type C usually causes either a very mild respiratory illness or no symptoms at all; it does not cause epidemics and does not have the severe public-health impact of influenza types A and B. Type A viruses are divided into subtypes and are named based on differences in two viral surface proteins called hemagglutinin (H) and neuraminidase (N). There are 16 known H subtypes and nine known N subtypes.

Transmission of the virus from pigs to humans is not common and does not always lead to human influenza, often resulting only in the production of antibodies in the blood. If transmission does cause human influenza, it is called zoonotic swine flu [10]. People with regular exposure to pigs are at increased risk of swine flu infection. The meat of an infected animal possesses no risk of infection when properly cooked [11].

### **Epidemiology**

As on 19 October 2009, more than 414 000 cases and about 5000 deaths had been reported to WHO by 195 countries worldwide [12]. The actual number of cases would be many more as laboratory facilities for confirmation of the diagnosis are limited. Moreover, many countries no longer test patients with flu-like illness for H1N1. As of 19 October 2009, in the WHO Southeast Asia region, 10 of 11 member countries have reported 41 513 cases of H1N1 virus infection and 573 deaths. The 3 hardest hit countries in the region are Thailand (26 465 cases, 165 deaths), India (11 068 cases, 351 deaths) and Indonesia (1097 cases, 10 deaths). In India the state of Maharashtra is the worst affected, followed by Karnataka.

It is difficult to estimate precisely the number of people infected by the H1N1 virus as many may not have developed symptoms, while others with mild illness may not have sought medical care. Uncertainties remain about the extent to which this virus may eventually spread. This will, we believe, depend on 3 factors: communicability of the virus, as measured by attack rates; its virulence or severity, as measured by case fatality rates; and the implementation of an effective national response, in particular, proper case management, measured by the surge capacity of the health or medical services [13].

### **Signs and Symptoms**

#### **In swine [14, 15]**

In pigs influenza infection produces following symptoms

- Fever
- Lethargy
- Sneezing
- Coughing
- Difficulty breathing and
- Decreased appetite
- Abortion
- Weight loss and poor growth, infected pigs can lose up to 1 pounds of body weight over a 3 to 4 week period

**In humans [16, 17]**

According to the Centers for Disease Control and Prevention (CDC), in humans the symptoms of the 2009 "swine flu" H1N1 virus are similar to those of influenza and of influenza-like illness in general. Symptoms includes

- Fever
- Cough, sore throat
- Body and headache
- Chills and fatigue
- Muscles and joint pain
- Shortness of breath
- Diarrhea and vomiting

**Sample Collection & Laboratory Diagnosis [18]**

Patients with flu-like-symptoms should seek medical help immediately on onset of symptoms. This helps in early diagnosis, proper treatment and prevention of complications. For diagnosis of swine influenza A infection, respiratory specimen (NP (nasopharyngeal swab), throat swab (nasal aspirate, nasal washing) would generally need to be collected within the first 4 to 5 days of illness (when an infected person is most likely to be shedding virus). However, some persons, especially children, may shed virus for 10 days or longer.

- Sample Collection and handling is same as for human avian flu or seasonal influenza like illness.
- Sample Collection: should be labeled clearly and include patient's complete information.
- Laboratory biosafety measures should be followed for collection, storage, packaging and shipping of influenza samples.

**Available Laboratory tests**

- Rapid Antigen Tests: not as sensitive as other available tests.
- RT-PCR
- Virus isolation
- Virus Genome Sequencing
- Four-fold rise in swine influenza A (H1N1) virus specific neutralizing antibodies. It is important to note that samples from all cases, once the Pandemic starts, are not required to be tested.

**Preventive Measures**

There is no need to worry a lot as the Swine flu is curable. As suggested by elders that prevention is better than cure, the following precautionary measures must be taken, to minimize the chances of getting infected with Swine flu;

1. People showing flu like symptoms such as fever, cough, running nose and difficulty in breathing should be allowed to stay at home for a period of 7 to 10 days and consult your nearest medical practitioner

2. Avoid contact with the pigs (swine). If you have pigs in your area then please inform the local municipal office so that they can take care of those pigs by keeping them isolated.
3. Keep a distance of minimum 6 feet from people affected with Catarrh, Cough and Fever.
4. Swine flu is communicable disease, so use the face masks to protect from the swine flu antigens.
5. Cover your nose and mouth when coughing or sneezing, using one time disposable tissue when possible.
6. Avoid shaking hands, embracing and visiting the congested places and also crowded places like theaters, this can be a cause of spreading ground for Swine flu.
7. Wash your hands frequently with soap or diluted water of dettol at least 6-8 times a day to reduce the spread of virus.
8. Instruct the above points to children as they may be victimized easily with the Swine flu.
9. Avoid eating outside food because it may be contaminated and may make you infected with the virus.
10. Don't use the public urinals because many people spit there, which could lead to the spreading of the disease.
11. Use boiled water only to drink.

### **Vaccination**

A flu vaccine is the single best way to protect against influenza illness. There are two kinds of 2009 H1N1 vaccines being produced: A **2009 H1N1 “flu shot”**— an inactivated vaccine (containing killed virus) that is given with a needle, usually in the arm. The indications for who can get the 2009 H1N1 flu shot are the same as for seasonal flu shots. The flu shot is approved for use in people 6 months of age and older, including healthy people, people with chronic medical conditions and pregnant women. The same manufacturers who produce seasonal flu shots are producing 2009 H1N1 flu shots for use in the United States this season. The 2009 H1N1 flu shot is being made in the same way that the seasonal flu shot is made.

### **The 2009 H1N1 nasal spray flu vaccine**

A vaccine made with live, weakened viruses that do not cause the flu (sometimes called LAIV for “live attenuated influenza vaccine”). The indications for who can get the 2009 H1N1 nasal spray vaccine are the same as for seasonal nasal spray vaccine. LAIV is approved for use in healthy\* people 2 years to 49 years of age who are not pregnant. The nasal spray vaccine for use in the United States is being made by Med Immune, the same company that makes the seasonal nasal spray vaccine called “FluMist®.” The 2009 H1N1 nasal spray vaccine is being made in the same way as the seasonal nasal spray vaccine.

About 2 weeks after vaccination, antibodies that provide protection against 2009 H1N1 influenza virus infection will develop in the body. The 2009 H1N1 vaccine will not protect against seasonal influenza viruses. Vaccination against 2009 H1N1 should begin as soon as vaccine is available and continue throughout the influenza season, into December, January, and beyond. This is because the timing and duration of flu activity can vary. Flu seasons can last as late as April or May. CDC's Advisory Committee on Immunization Practices (ACIP), a panel made up of medical and public health experts, met July 29, 2009, to make recommendations on who should receive the 2009.

H1N1 vaccine when it becomes available. People in the following five target groups:

- ❖  pregnant women

- ❖ people who live with or provide care for infants younger than 6 months (e.g., parents, siblings, and day care providers)
- ❖ health care and emergency medical services personnel
- ❖ people 6 months through 24 years of age, and,
- ❖ People 25 years through 64 years of age who have certain medical conditions that put them at higher risk for influenza-related complications [19].

### **Treatment**

#### **A. Allopathic [20, 3, 4]**

##### **In-swine**

As swine influenza is rarely fatal to pigs, little treatment beyond rest and supportive care is required. Instead veterinary efforts are focused on preventing the spread of the virus throughout the farm, or to other farms. Vaccination and animal management techniques are most important in these efforts.

##### **In-humans**

If a person becomes sick with swine flu, antiviral drugs can make the illness milder and make the patient feel better faster. Use Tamiflu (Oseltamivir) or Relenza (Zanamivir) for the treatment and prevention of infection of swine influenza viruses; however, no clinical studies have been conducted to assess the safety of these medications for pregnant women. The virus has been found resistant to Rimantadine and Amantadine.

**Dosage:-**Oseltamivir (Tamiflu) for adults 75mg- two times a day, for children 30mg-two times a day.

**Route of administration:-** oral medication.

**Dosage:-**Zanamivir for adults 5mg-two times a day. For children 5mgone time a day.

**Route of administration-** inhaled through a device similar to an asthma inhaler and should not be used by anyone with respiratory conditions such as asthma and lung diseases.

#### **B. Ayurvedic [21-23]**

Swine flu invades the body because of a breakdown in immunity. And Ayurveda offers simple & effective remedies to boost immunity & build resistance.

Take following daily to prevent Swine Flu:-

1. Amla (raw green) - 2 per day (body immunity enhancer)
2. Tulsi (Basil leaves) – 20 to 25 Leaves per day (body immunity enhancer)

3. Garlic – 4 pieces per day intermittently at 4 hour interval throughout the day as prevention (strong odor keep germs away – Chewing fresh garlic cloves is effective home remedy as garlic is a good antiviral), 16 pieces per day if you have swine flu.
4. Ginger- 1 small raw piece (body immunity enhancer)
5. Haldi Powder & Fresh Lime – Half spoon Haldi Powder + 1 Fresh Lime Juice with half glass of water (body immunity enhancer)
6. Tea made from Laxmi Taru leaves (botanical name: Simarouba), Tulsi, Amla and Amrut (Giloy) acts as an immunity enhancer.
7. Ginger and Turmeric (haldi) powder mixed with either lime juice or honey can also be taken twice a day.
8. Pippali has a special therapeutic affinity for the mucosa of the respiratory tract. It can reduce inflammation, swelling and excessive secretions in the lungs, throat and nose. In addition, it also normalizes the damage done to the mucosal lining due to acute and chronic disease. In acute disease of the respiratory tract, it is usually given in small doses along with other medicines. In chronic diseases, it is given in progressively increasing doses till tolerance, or till a pre-determined dose, and then reduced gradually.

### **C.Homeopathic**

**Influenzinum** 200 – 5 pills 3 times a day.

### **D.Pranayama and Meditation**

In addition, our mind also plays an important role in our immunity. Whenever we panic and have fear, our immunity level goes down. Practices like pranayama and meditation play a vital role in reducing panic / fear and keeping ourselves calm. It has been empirically proved that practices such as pranayama and meditation boosts immunity at least three-fold. If we can integrate these practices in our daily lives along with the simple Ayurvedic remedies, we can effectively counter swine flu.

### **Conclusion**

The 2009 influenza pandemic has affected most countries of the world within a short span of time. Though at present, the pattern of illness does not differ from that of seasonal influenza, the sheer volume of cases that is expected to occur could easily overstretch the already fragile and overburdened health services, and cause considerable suffering in human populations around the world. It is a matter of much concern that while the novel virus is at present causing a mild disease in most cases, the next wave may be more severe. Larger numbers of severely ill patients requiring intensive care are likely to be the most urgent burden on health services, creating pressures that could overwhelm intensive care units and possibly disrupt the provision of care for other diseases. This calls for an enhanced surge capacity of health or medical services in each country to enable the health facilities to clinically manage an increased patient load in the future and keep the rate of fatality low.

Although, the role of antivirals and vaccines is indisputable, the limited supply and lack of access in most developing countries can undermine the response capacity of the region and hence, enhance these countries vulnerability in an emergency situation. Traditional non-pharmacological approaches to the prevention and control of disease have stood the test of time. Modern communication tools, the enhanced availability of antivirals and community awareness regarding the desirable behavioural changes may attenuate the effects of this pandemic. As new information about the virus and/or technologies (such as for a vaccine) become available, the opportunity should be taken to further strengthen prevention and control strategies, and minimize the overall health, social and economic effects of the pandemic in the coming years.

Take the precautions and protection from the exposure of Swine flu environment. Always keep in mind that “Prevention is better than cure”.

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