Swine Flu: Need to Adopt Safety Measures

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Introduction
Swine influenza is a highly contagious respiratory disease of pigs caused by one of several swine influenza A viruses. Outbreaks are common in pigs year-round, and infection in humans is a result of close contact with infected animals. This virus is a new subtype of influenza A (H1N1) that was not previously detected in swine or humans. More importantly, this new strain now appears to be spread by human-to-human transmission. Since there is evidence of human-to-human transmission, it has become pandemic.

Government and public health officials are monitoring this situation worldwide to assess the threat from swine flu and to provide guidance to healthcare professionals and the public.

Global Scenario
H1N1 was first reported in Mexico on 18 March 2009 and then spread to neighbouring United States and Canada. As on 21 June 2009, World Health Organisation has reported 44,287 laboratory-confirmed cases of influenza A/H1N1 infection with 180 deaths from 94 countries spread over America, Europe, Asia and Australian continent.

Situation in India
The behaviour of this mutant virus among the Asian population cannot be predicted. The virus has the potential to mutate further and become a lethal virus. Samples of 421 persons have been tested of which 59 have been tested positive for H1N1. Of these, six cases are indigenous cases who got the infection from the positive cases travelled from abroad. The rest of the samples have been found negative for the novel virus. Of the 59 cases, 32 have been discharged.

Definition: A confirmed case of S-OIV infection is defined as a person with an acute febrile respiratory illness with laboratory confirmed S-OIV infection by one or more following tests (i) Real-Time RTPCR; (ii) Viral Culture; (iii) Four fold rise in virus specific neutralising antibodies.

Population at Risk: The populations at risk are those who (i) live in areas with confirmed human cases of swine influenza A (H1N1) virus infection; (ii) who travelled recently to Mexico or were in contact with persons who had febrile respiratory illness; (iii) those with an acute respiratory illness and recent history of contact with an animal with confirmed swine influenza.

Transmission: The transmission is by droplet infection and fomites. Incubation period is 1-7 days. Communicability: From 1 day before to 7 days after the onset of symptoms. If illness persist for more than 7 days, chances of communicability may persist till resolution of illness. Children may spread the virus for a longer period.

Clinical features: Persons infected with swine flu may appear similar to those with seasonal influenza include at least 2 of the following: (i) Rhinorrhea or nasal congestion; (ii) Sore throat; (iii) Cough; and (iv) Fever.

In addition, they may have body aches, headache, chills, fatigue, and possibly diarrhoea and vomiting.

Diagnostic Measures: Preferred specimens include: (i) Respiratory specimen; (ii) Naso-Pharyngeal aspirate, Throat swab; (iii) Nasal-wash aspirate into viral culture; (iv) Dacron nasal swab.

If the above are not possible, a combined nasal swab with an naso-pharyngeal swab is collected.

Swabs with cotton tips and wooden shafts are not recommended. Specimens collected with swabs made of calcium alginate are not acceptable. The specimen should be placed in a 4°C refrigerator (not a freezer) or immediately placed on ice or cold packs for transport to the laboratory.

Treatment
Swine influenza A (H1N1) is susceptible to the neuraminidase inhibitor antiviral medications zanamivir and oseltamivir. It is resistant to amant...
dine and rimantadine.

Treatment recommendations are as follows:
1. Suspected cases: Treat with zanamivir alone or with a combination of oseltamivir and either amantadine or rimantadine as soon as possible after the onset of symptoms and for a duration of 5 days.
2. Confirmed cases: Zanamivir or oseltamivir should be administered for 5 days.
3. Pregnant women: Antiviral medications are in pregnancy category C, so they should be used during pregnancy only if the potential benefits outweigh the potential risks to the embryo or fetus.
4. Children younger than 1 year: Because infants typically have high rates of morbidity and mortality from influenza, infants with H1N1 infections may benefit from treatment with oseltamivir which is the recommended drug both for prophylaxis and treatment.

Adverse reactions of oseltamivir are generally well tolerated, gastrointestinal side effects (transient nausea, vomiting) may increase with increasing doses, particularly above 300 mg/day.

Supportive therapy includes IV fluids, parenteral nutrition and oxygen therapy / ventilatory support, antibiotics for secondary infection, vaspressors for shock, paracetamol or ibuprofen is prescribed for fever, myalgia and headache. Patient is advised to drink plenty of fluids. Smokers should avoid smoking.

The suspected cases would be constantly monitored for hypoxia. Patients should be supplemented with oxygen therapy. To reduce spread of infectious aerosols, use of HEPA filters on expiratory ports of the ventilator circuit / high flow oxygen masks is recommended.

After discharge, the family of patients discharged earlier should be educated on personal hygiene and infection control measures at home; children should not attend school during this period.

**Chemoprophylaxis for specific Populations**:
Chemoprophylaxis is recommended for 7 days after the last known exposure to a confirmed case of H1N1 virus. The CDC recommends that the following populations receive chemoprophylaxis: Household close contacts of a confirmed or suspected case; School children who have had close contact with a confirmed or suspected case; Travellers to H1N1 prevalent foreign countries are at high risk for complications of influenza (persons with certain chronic medical conditions, elderly); Health-care workers or public health workers who have had unprotected close contact with a person with confirmed H1N1 virus infection during the infectious period.

**Infection control measures**
During pre hospital care, standard precautions are to be followed. Aerosol generating procedures should be avoided. The personnel in the patient’s cabin of the ambulance should wear full complement of PPE including N95 masks, the driver should wear three layered surgical mask. Once the patient is admitted to the hospital, the interior and exterior of the ambulance and reusable patient care equipment needs to be sanitised using sodium hypochlorite / quaternary ammonium compounds.

During hospital care, the patient should be admitted directly to the isolation facility and continue to wear a three layer surgical mask. The identified Health professionals attending the suspect/probable / confirmed case should wear full complement of PPE (including N95 mask). Infection control precautions should continue in an adult patient for 7 days after resolution of symptoms and 14 days after resolution of symptoms for children younger than 12 years. The virus can survive in the environment for variable periods of time (hours to days). Cleaning followed by disinfection should be done for contaminated surfaces and equipments. The virus is inactivated by disinfectants such as 70% ethanol, 5% benzalkonium chloride (Lysol) and 10% sodium hypochlorite. Patient rooms/areas should be cleaned at least daily and finally after discharge of patient. When transporting contaminated patient-care equipment outside the isolation room/area, use gloves followed by hand hygiene. All waste generated from influenza patients in isolation room/area should be considered as clinical infectious waste and disposed in accordance with national regulations.

Standard operating procedures on use of PPE (personal protection equipments) reduces the risk of infection if used correctly. It includes: gloves (non-sterile), mask (high-efficiency mask) / three layered surgical mask, long-
sleeved cuffed gown, protective eyewear (goggles/visors/face shields), cap (may be used in high risk situations where there may be increased aerosols) and plastic apron if splashing of blood, body fluids, excretions and secretions is anticipated.

The PPE should be used in situations were regular work practice requires unavoidable, relatively closed contact with the suspected cases.

Infection control measures at individual level
1. **Hand Hygiene**: is the single most important measure to reduce the risk of transmitting infectious organism from one person to other. Hands should be washed frequently with soap and water / alcohol-based hand rubs/ antiseptic hand wash.

2. **Respiratory Hygiene/Cough Etiquette**: Health care professional should cover the nose/ mouth with a handkerchief/ tissue paper when coughing or sneezing; tissues should be used to contain respiratory secretions and dispose of them in the nearest waste receptacle after use.

3. **Staying away**: stay away from poultry. Keep them secure in cages. Keep children out of reach. Wash hands if in contact with poultry or poultry products. Stay at least one metre away from a person having cough or sneeze.

Infection control measures at health facility
1. **Droplet precautions**: Advise healthcare personnel to observe droplet precautions (i.e., wearing a surgical or procedure masks for close contact.

2. **Visual Alerts**: Post visual alerts (in appropriate languages) at the entrance to outpatient facilities (e.g., emergency departments, physician offices, outpatient, clinics) instructing patients and persons who accompany them (e.g., family, friends) to inform healthcare personnel about the symptoms of a respiratory infection when they first register or care and to practice Respiratory Hygiene/Cough Etiquette.

3. **Use of PPE**: The medical, nurses and paramedics attending the suspect/ probable / confirmed case should wear full complement of PPE. Use N-95 masks during aerosol-generating procedures. Perform hand hygiene before and after patient contact. Sample collection and packing should be done under full cover of PPE.

4. **Decontaminating contaminated surfaces, fomites and equipments**: Cleaning followed by disinfection should be done for contaminated surfaces and equipments. Use phenolic disinfectants, quaternary ammonium compounds, alcohol or sodium hypochlorite. Patient rooms/ areas should be cleaned at least daily and terminally after discharge. Use standard precautions for cleaning and disinfection or sterilisation of reusable patient-care equipment.

5. **Waste disposal**: All the waste has to be treated as infectious waste and decontaminated as per standard procedures. Articles like swabs/ gauges etc are to be discarded in the yellow coloured autoclavable biosafety bags. Waste like used gloves, face masks and disposable syringes etc are to be discarded in Blue/ White autoclavable biosafety bags which should be autoclaved / micro-waved before disposal.

**References**
1. http://www.who.int
3. http://www.mohfw.nic.in
4. www.icn.ch

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