



Influenza A H1N1

Clinical management Protocol and Infection Control Guidelines

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1. Introduction

Flu like symptoms may be caused by many viruses including Influenza virus, parainfluenza virus, adeno-virii, RSV etc. But the commonest pathogen responsible for the seasonal flu are influenza viruses. There are at least three types of Influenza viruses - Type A, B, and C. Influenza virus A is further characterized into subtypes according to different kind and combination of virus surface proteins e.g H1N1, H2N2, H3N2, H5N1 (Avian influenza) etc.

The term "Swine flu" has recently been used incorrectly to refer to the seasonal influenza A (H1N1) virus which infects humans. The term "swine flu" means influenza viruses that circulate in swine population and infect pigs and hogs. Swine influenza virus is common throughout pig populations worldwide. **Transmission of the virus from pigs to humans** is not common and does not always lead to human flu.

2. Epidemiology

2.1 *The agent*

Influenza A (H1N1) virus.

2.2 *Transmission*

The transmission is by droplet infection and fomites.

- 70% hand to hand
- 30% direct droplet

2.3 *Incubation Period* 1-7 days.

2.4 *Communicability*

From 1 day before to 7 days after the onset of symptoms. If illness persists for more than 7 days, chances of communicability may persist till resolution of illness. Children may spread the virus for a longer period.

2.5 *Seasonality:*

Peak during winter and temperate region, in some tropical countries, influenza viruses circulate throughout the year with one or two peaks during rainy season.

3. Clinical features

Important clinical features of H1N1 influenza include fever, and upper respiratory symptoms such as cough, running nose and sore throat. Headache, body ache, fatigue diarrhea and vomiting have also been observed.

4. Investigations

Routine investigations required for evaluation and management of a patient with symptoms as described above will be required. These may include hematological, biochemical, radiological and microbiological tests as necessary.

Confirmation of influenza A (H1N1) infection is through:

Real time RT PCR – from onset of symptoms through day 5 or
Isolation of the virus in culture - from onset of symptoms through day 5 or
Four-fold rise in virus specific neutralizing antibodies – after 6th day of symptoms.

For confirmation of diagnosis, clinical specimens such as nasopharyngeal swab, throat swab, nasal swab, wash or aspirate and tracheal aspirate (for intubated patients) are to be obtained. The sample should be collected by a trained physician / microbiologist preferably **before administration of the anti-viral drug**. Keep specimens at 4°C in viral transport media until transported for testing. The samples should be transported to designated laboratories within 24 hours. If they cannot be transported then it needs to be stored at -70°C. Paired blood samples at an interval of 14 days for serological testing should also be collected to see rising titer of antibodies.

5. Treatment

The guiding principles are:

- Early implementation of infection control precautions to minimize nosocomial / household spread of disease
- Prompt treatment to prevent severe illness & death.
- Early identification and follow up of persons at risk.

5.0 Infrastructure / manpower / material support

- Isolation facilities: if dedicated isolation room is not available then patients can be cohorted in a well-ventilated isolation ward with beds kept one meter apart.

- Manpower: Dedicated doctors, nurses and paramedical workers.
- Equipment: X Ray machine, ventilators, oxygen availability, pulse oxymeter
- Supplies: Adequate quantities of basic PPE, disinfectants and medications (Oseltamivir, antibiotics and other medicines)

5.2 Standard Operating Procedures

- Reinforce standard infection control precautions i.e. all those entering the room must use Face -masks, gowns, goggles, gloves, cap and shoe cover.
- Restrict number of visitors and provide them with Basic PPE (Personal Protective Equipment).
- Dispose waste properly by placing it in sealed impermeable bags labeled as Bio- Hazard.

5.3 Medication

- Oseltamivir is the recommended drug both for prophylaxis and treatment.
- If a person conforms to the case definition of probable or confirmed, then he would be provided Oseltamivir on attending physicians advised preferably within 24-48 hrs of onset.
- Dose for treatment is as follows:

By Weight:

- | | |
|--------------------|---------------------|
| - For weight <15kg | 30 mg BD for 5 days |
| - 15-23kg | 45 mg BD for 5 days |
| - 24-<40kg | 60 mg BD for 5 days |
| - >40kg | 75 mg BD for 5 days |

Adverse effects of Oseltamivir:

Oseltamivir is generally well tolerated, gastrointestinal side effects (transient nausea, vomiting) may increase with increasing doses. Occasionally it may cause insomnia and vertigo. There have been rare reports of anaphylaxis and skin rashes. In children, most frequently reported side effect is vomiting. Infrequently, abdominal pain, epistaxis, otitis media, dermatitis and conjunctivitis have also been observed. There is no recommendation for dose reduction in patients with hepatic disease but it should be given cautiously in patients with advanced renal disease.

5.4 Supportive therapy

- IV Fluids.
- Oxygen therapy/ ventilatory support.
- Antibiotics for secondary infection.
- Vasopressors for shock.
- Paracetamol or ibuprofen should be prescribed for fever, myalgia and headache. Patient should be advised to drink plenty of fluids. Smokers should avoid smoking. For sore throat, short course of topical decongestants, saline nasal drops, throat lozenges and steam inhalation may be beneficial.
- **Salicylate / aspirin is contra-indicated in children** with influenza due to its potential to cause Reye's syndrome.
- The suspected cases should be constantly monitored for clinical / radiological evidence of lower respiratory tract infection and for hypoxia (respiratory rate, oxygen saturation, level of consciousness).

- Patients with signs of tachypnea, dyspnea, respiratory distress and oxygen saturation less than 90 per cent should be supplemented with oxygen therapy.
- Patients with severe pneumonia and acute respiratory failure (SpO₂ < 90% and PaO₂ <60 mmHg with oxygen therapy) must be supported with mechanical ventilation. Invasive mechanical ventilation is preferred choice. Noninvasive ventilation is an option when mechanical ventilation is not available.
- Maintain hydration, electrolyte balance and nutrition.

5.5 Discharge Policy

Patients who have responded to treatment and are clinically stable - may be discharged 24 hours of defervesce at the discretion of attending physician with total 5 days of Oseltamivir treatment.

The family of patients should be educated on personal hygiene specially hand washing and infection control measures at home; children should not attend school during this period.

5.6 Chemoprophylaxis

Chemoprophylaxis for contacts

- Chemoprophylaxis is advised for those contacts who are in high risk group (with underlying systemic diseases; extremes of age [< 5 years and 65 > years])

Close Contacts of confirmed cases should also be advised to remain at

home (voluntary home quarantine) for at least 7 days after the last contact with the case. Monitoring of fever should be done for at least 7 days. Must seek medical advice if fever or flu like symptoms appear.

6. Laboratory Tests

The samples are to be tested in National Institute of health Islamabad, **through Director General Health Services, Punjab, 24-Cooper Road, Lahore. Telephone: 042-99201139-40.**

Guidelines on Infection control Measures

Infection control measures would be targeted according to the risk profile as follows:

1. Health facility managing the human cases of Influenza A H1N1

1.1 During Pre Hospital Care

- Standard precautions are to be followed while transporting patient to a health-care facility. The patient should also wear a surgical mask.
- Aerosol generating procedures (suction) should be avoided during transportation as far as possible.
- The personnel in the patient's cabin of the ambulance should wear basic PPE with Face masks, the driver should wear 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 sanitized using sodium hypochlorite / quaternary ammonium compounds.
- Recommended procedures for disposal of waste (including PPE used by personnel) generated in the ambulance while transporting the patient should be followed.

1.2 During Hospital Care

- Suspected cases should report at Influenza Counters for proper triage.
- The patient should be admitted to the isolation facility and continue to wear a surgical mask.
- The identified medical, nursing and paramedical personnel attending the suspect/ probable / confirmed case should wear

full PPE.

- Aerosol-generating procedures such as endotracheal intubation, nebulized medication administration, induction and aspiration of sputum or other respiratory secretions, airway suction, chest physiotherapy and positive pressure ventilation should be performed by the treating physician/ nurse wearing complement of PPE preferably with Face Mask on.
- Sample collection and packing should be done under full cover of PPE with Face mask.
- Perform hand hygiene, hand washing, preferably alcohol based hand sanitizer before and after patient contact and following contact with contaminated items, whether or not gloves are worn.
- 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 because of longer period of viral shedding expected in children. If the patient insists on returning home, after resolution of fever, it may be considered, provided the patient and household members follow recommended infection control measures.
- 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 equipment using sodium hypochlorite / quaternary ammonium compounds.
- The virus is inactivated by a number of disinfectants such as 70% ethanol and 10% sodium hypochlorite (common name - liquid bleach). Patient rooms/areas should be cleaned at least daily and finally after discharge of patient with 10% sodium hypochlorite. In addition to daily cleaning of floors and other horizontal surfaces, special attention should be given to cleaning and disinfecting frequently touched surfaces. To avoid possible aerosolization of the virus, damp sweeping should be performed with 10% sodium hypochlorite. Horizontal surfaces should be dusted by moistening a cloth with a small amount of disinfectant.
- Clean heavily soiled equipment and then apply a disinfectant effective against influenza virus (10% sodium hypochlorite as mentioned above) before removing it from the isolation room/area. If possible, place contaminated patient-care equipment in suitable bags before removing it from the isolation room/area.
- When transporting contaminated patient-care equipment outside the isolation room/area, use gloves followed by hand hygiene. Use standard precautions and follow recommendations for cleaning and disinfection or sterilization of reusable patient-care equipment.

- All waste generated from influenza patients in isolation room/area should be considered as clinical infectious waste and should be treated and disposed in accordance with standard guideline pertaining to such waste. When transporting waste outside the isolation room/area, gloves should be used followed by hand hygiene.

Case Definition

A **suspected case** of influenza A (H1N1) virus infection is defined as:

- A person with acute febrile illness (fever $\geq 38^{\circ}\text{C}$) **with** sore throat, cough, headache and myalgia.
&
- Individual with a clinically compatible illness who died of an unexplained acute respiratory –illness who is considered to be epidemiologically linked to a probable or confirmed case. Any of the warning signs

A **probable case** of influenza A (H1N1) virus infection is defined as a person who **meets criterion of suspected case and in addition** has any one of the followings:

- History of close contact with a person who is a confirmed case of influenza A (H1N1) virus infection, in last 7 days,
- Or has at least 3 of the warning signs in addition to the features described for suspected case.
- **Warning signs**
 - in adults (at least 3):
 - Breathlessness
 - Chest pain
 - Drowsiness
 - Fall in Blood pressure
 - Sputum mixed with Blood
 - Bluish discoloration of skin

In Children (At least 3):

- Somnolence
- High and persistent fever
- Inability to feed were
- Shortness of breath,
- Irritability
- Bluish discoloration of skin

A **confirmed case** of influenza A (H1N1) virus infection is defined as a person with an acute febrile respiratory illness with laboratory confirmed influenza A (H1N1) virus infection by one or more of the following tests:

- Real Time PCR (PCR available at NIH) - During first 5 days of illness
- viral culture – during first 5 days of illness
- Four-fold rise in influenza A (H1N1) virus specific neutralizing antibodies in a paired sample after 6th day of illness.

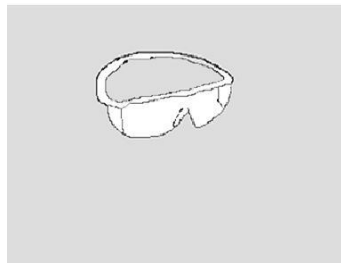
Annexure II

Standard Operating Procedures on Use of PPE

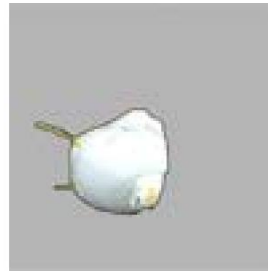
Personal Protection Equipment

PPE reduces the risk of infection if used correctly. It includes:

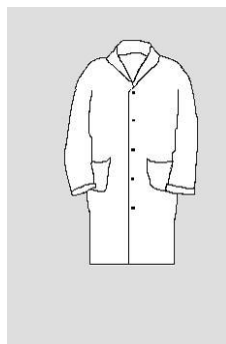
- Gloves (nonsterile),
- Mask (high-efficiency mask) / surgical mask,
- Long-sleeved cuffed gown,
- Protective eyewear (goggles/visors/Face shields),
- Cap (may be used in high risk situations where there may be increased aerosols),
- Plastic apron if splashing of blood, body fluids, excretions and secretions is anticipated.



Goggles



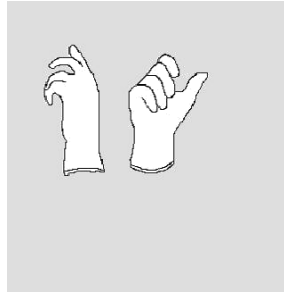
N-95 Mask



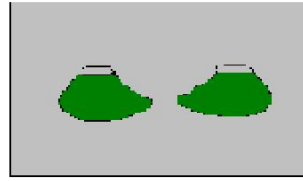
Gown(must for lab work)



Surgical Mask



Gloves



Shoe covers

The PPE should be used in situations where regular work practice requires unavoidable, relatively closed contact with the suspected human case

Annexure III

Guidelines/ operating procedures for infection control practices

1. Infection control measures at Individual level

1.1 Hand Hygiene

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 and thoroughly dried preferably using disposable tissue/ paper/ towel.

- After contact with respiratory secretions or such contaminated surfaces.
- Any activity that involves hand to Face contact such as eating/ normal grooming / smoking etc.

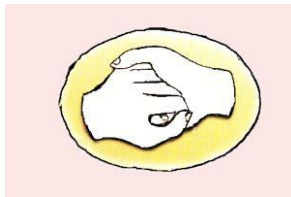
Steps of hand washing



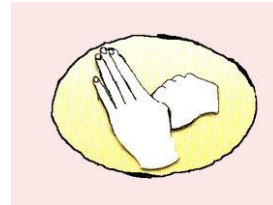
Step 1.
Wash palms and fingers.



Step 2.
Wash back of hands.



Step 3.
Wash fingers and knuckles.



Step 4.
Wash thumbs.



Step 5.
Wash fingertips.



Step 6.
Wash wrists.

1.2 Respiratory Hygiene/Cough Etiquette

The following measures to contain respiratory secretions are recommended for all individuals with signs and symptoms influenza like illness.

- ◆ Cover the nose/mouth with a handkerchief/ tissue paper when coughing or sneezing;
- ◆ Use tissues to contain respiratory secretions and dispose of them in the nearest waste receptacle after use;
- ◆ Perform hand hygiene (e.g., hand washing with non-antimicrobial soap and water, alcohol-based hand rub, or antiseptic hand wash) after having contact with respiratory secretions and contaminated objects/materials