Reveiw Article

Swine Flu

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Abstract
Swine flu is a respiratory disease caused by influenza viruses that can be transmitted to humans from pigs and result in a barking cough, decreased appetite, nasal secretions and listless behavior. Swine flu viruses may change within one to four days so that they are easily transmissible among humans. Symptoms of swine flu in humans are similar to most influenza infections: fever (100 F or greater), cough, nasal secretions, fatigue, and headache. The incubation period for the disease is about one to four days. Swine flu is contagious from about one day before the onset of symptoms to about five to seven days after symptoms develops; some patients may be contagious for a longer time span. The disease lasts about three to seven days with more serious infections lasting up to 10 days. It has a devastating effect on the economy and health of the communities even though it can be prevented and controlled with different measures like vaccines and antiviral drugs. The most serious complication of the flu is pneumonia.

Keywords: H1N1 visus, Influenza, PPE**,** Pandemic, Swine Flu.

Introduction

The swine flu is an infection of the nose, throat, and lungs. There are three major types of influenza that infect humans influenza A, B and C. Influenza A and B can both cause serious infections, and are the cause of what we call the flu. Influenza C virus differs from influenza A and B, and only causes a mild infection. The seasonal influenza a strains currently circulating in humans is H1N1 and H3N2, but they have changed a lot since their first introduction into humans. Influenza B strains do not circulate in animals, so they cannot cause a disease. But, like influenza A viruses, they continually change, so we will never become immune to every strain [Centers for Disease Control and Prevention (CDCP), 2016].

A person must not fear of having H1N1 influenza if he/she has simply cold, cough and fever. But if those symptoms are seen among the persons who had visited the affected area or been in contact with H1N1 influenza infected person then he/she must be screened for the disease.

History

Eruptions of swine flu in humans dates back to investigation of the 1918 Spanish influenza pandemic, which infected one third of the world's population (an estimated 500 million people) and caused approximately 50 million deaths. In 1918, the cause of human influenza and its links to avian and swine influenza was not understood. The answers did not begin to emerge until the 1930s, when related influenza viruses (now known as H1N1 viruses) were isolated from pigs and then humans. In 2009, cases of influenza like illness were first reported in Mexico on March 18; then the outbreak was subsequently confirmed as H1N1 influenza A. It was termed H1N1 flu since it was mainly found infecting people and exhibits two main surface antigens, H1 (hemagglutinin type 1) and N1 (neuraminidase type1).

A few months (on June 11, 2009) after the first swine flu cases were reported, rates of confirmed H1N1-related illnesses were increasing in many parts of the

world. As a result, the World Health Organization declared the infection a global pandemic (WHO, 2010). Nepal has started laboratory diagnosis of pandemic influenza A/H1N1 from mid June 2009 though active screening of febrile travelers with respiratory symptoms was started from April 27, 2009. Case fatality ratio for pandemic influenza A/H1N1 in Nepal was 1.74 % (Adhikari et al, 2011). The second half of 2011, a novel swine influenza virus was emerged. The new strain, dubbed a (H3N2), includes a gene from the human pandemic strain and affects mostly children. The virus was a result of pig-to-human transmission (Christopher, 2002).

Mode of Transmission

Any flu virus can spread from person to person when person with the flu coughs or sneezes into air that others breathe in. Someone touches a doorknob, desk, computer, or counter with the flu virus on it and then touches their mouth, eyes, or nose. Someone touches mucus while taking care of a child or adult who is ill with the flu.

Risks for H1N1 influenza

Persons at higher risks for H1N1 influenza are children aged younger than 5years, adults aged 65 years and older, health care professionals, obesity (BMI ≥40), pregnant women during the influenza season, caregivers of people with medical conditions, residents of long- term-care facilities, persons with different diseases like; lung, heart, liver, kidney disease, blood disorders (sickle cell anemia), diabetes, neurological disorders, cancer and HIV/AIDS. Similarly persons with immunosuppressant either by medications or HIV infection are also at risk.

Incubation Period

The incubation period for the disease is about one to four days.

Contagious period: In adults it usually begins 1 day before the onset of symptoms and lasts about 5 to 7 days after the person becomes sick. However, people with weakened immune systems and children may be contagious for a longer period (about 10 to 14 days).

Period to resolve the swine flu: In uncomplicated infections, swine flu typically begins to resolve after 3 to 7 days, but the malaise and cough can persist 2 weeks or more in some patients. Severe swine flu may require hospitalization that increases the length of time of infection to about 9 to 10 days

Pathophysiology

When influenza virus is introduced into the respiratory tract, by aerosol or by contact with saliva or other respiratory secretions from an infected individual, it attaches to and replicates in epithelial cells. The virus replicates in cells of both the upper and lower respiratory tract. Viral replication combined with the immune response to infection lead to destruction and loss of cells lining the respiratory tract. As infection subsides, the epithelium is regenerated, a process that can take up to a month. Cough and weakness may persist for up to 2 weeks after infection.

Clinical Presentation

Clinical presentation of Swine flu are fever (>100^0F), coryzal symptoms (congestion, runny nose), cough, sore throat, difficulty in breathing, body ache, headache, chills and fatigue, diarrhea and vomiting (possible). In children, signs of severe disease may present that include apnea, tachypnea, dyspnea, cyanosis, dehydration, altered mental status, and extreme irritability.

Diagnosis

Diagnosis may be made based on the signs and symptoms of the disease and history of onset & duration of symptoms. The Centers for Disease Control and Prevention (CDC) criteria for suspected H1N1 influenza are: 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 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.

Physical Examination: Physical examination

may found high temperature≥100^{0}F, chills, coryzal symptoms, cough, and sore throat.

Laboratory Diagnosis: Laboratory tests include blood tests, chest X-rays and throat, nasal and nasopharyngeal secretions or tracheal aspirate or washings tests. Sample need to be collected within the first 4 to 5 days of illness (when an infected person is most likely to be shedding virus).

Management of Swine Flu

Therapeutic Management: Treatment is largely supportive and consists of bed rest, increased fluid consumption, cough suppressants, and antipyretics and analgesics (e.g., acetaminophen, non-steroidal anti-inflammatory drugs) for fever and myalgia. Severe cases may require intravenous hydration and other supportive measures along with mechanical ventilation, if needed.

Antiviral treatment should be considered for confirmed, probable, or suspected cases of H1N1 influenza. An antiviral agent within 48 hours of symptom onset is imperative for providing treatment efficacy against influenza virus. The recommended duration of treatment is 5 days. Antiviral drugs can shorten the illness duration by 1 day, hospitalization and may reduce the risk of complications from influenza (e.g. otitis media in young children, pneumonia and respiratory failure).

Antiviral drugs: Oseltamivir 75mg orally BD for 5 days, Zanamivir 10 mg BD for 5days starting within 48 h of the initial symptoms via inhaler if resistant to Oseltamivir.

Prophylaxis: Prophylaxis with antiviral agents should also be considered (pre-exposure or post-exposure). For chemoprophylaxis, the recommended dosage of Oseltamivir is 75 mg taken once daily for 10 days after exposure and Zanamivir two 5mg inhalations (10mg total) once daily.

Nursing Management

Standard & droplet precautions: When working in direct contact with patients, standard and droplet precautions should always be applied.

Vaccination: There is a vaccine available to protect against swine flu, all should take it.

Hand Hygiene: Health care personnel (HCP) should perform hand hygiene before and after all patient contact, by washing with soap and water or using alcohol-based hand rubs.

Use personal protective equipment (PPE): Personnel protective equipment used in health care settings are: gloves, gowns/aprons, masks, goggles and face shields. PPE should be donned before contact with the patient, generally before entering the room. They should be removed and discarded carefully, either at the doorway or immediately outside patient room; but mask should be removed after leaving patient room and closing door. They should perform hand hygiene immediately before putting on and after removing all PPE. Different types of PPE are used together to prevent multiple routes of transmission.

Approach to putting on PPE: The following sequence is a general approach to putting on PPE first gown; then mask or respirator; then goggles or face shield; then gloves.

Approach to removing PPE: The following sequence is a general approach to removing PPE first gloves; then goggles or face shield; then gown; then mask or respirator.

Gowns: Sterile gowns are only necessary for performing invasive procedures, such as inserting a central line. Gowns should fully cover the torso, fit comfortably over the body, and have long sleeves that fit snuggly at the wrist. While removing isolation gown person should unfasten ties, peel gown away from neck and shoulder and turn contaminated outside toward the inside folding or rolling into a bundle and discard it.

Surgical Mask: Mask should be checked to make sure that there are no defects, and placed over nose, mouth and chin. While removing a mask, health care personnel should untie the bottom, then top tie. For ear loop mask, remove the mask from the side with head tilted forward (mask should be disposed by touching only the ear loops or the ties) and discard it. Mask should never leave a mask hanging off one

ear or hanging around neck and it should not be reused.

N95 Respirator Indent: It is necessary to protect from inhalation of infectious sprays. Health care provider should use respiratory protection, a fit-tested disposable N95 filtering face-piece respirator upon entry to the patient room or care area. If disposable respirators are used, they should be removed and discarded after leaving the patient room or care area and closing the door. N95 Respirators should not be left hanging around neck.

While removing it, one should tilt head forward and remove the N95 respirator by pulling bottom strap over back of head, followed by the top strap without touching the front of mask. Discard an N95 respirator by touching straps only and perform hand hygiene before and after use of an N95.

Face Protection: Masks should fully cover nose and mouth and prevent fluid penetration. Goggles should fit snuggly over and around eyes and secured to the head using the ear pieces or headband; personal glasses are not a substitute for goggles. Face shields should cover forehead, extend below chin and wrap around side of face. While removing goggles, ear or head pieces should be grasped with ungloved hands and lifted away from face. Then, they should be placed in designated receptacle for processing or disposal.

Gloves: Health care personnel should clean hands before putting on gloves and after removing gloves. They should change gloves if it is torn and when heavily soiled (even during use on the same patient) and after use on each patient. They should not touch face or adjust PPE with contaminated gloves and not touch environmental surfaces except as necessary during patient care.

While removing the 1st glove, edge near the waist should be grasped and peeled away from hand, turning glove inside out and hold in the opposite gloved hand. While removing the 2ndglove ungloved finger should be slide under the wrist of the remaining glove and peeled off from inside, creating a bag for both gloves & then discard.

Patient Placement : A patient who may be infected with H1N1 influenza virus associated with severe disease should be placed in an Airborne Infection Isolation Room (AIIR) .If an AIIR is not available, the patient should be transferred as soon as is feasible to a facility where an AIIR is available. Awaiting transfer, a facemask on patient should be placed and he/ she should be isolated in an examination room with the door closed. The patient should not be placed in any room where room exhaust is re-circulating without high-efficiency particulate air (HEPA) filtration. Limited personnel should be allowed to enter the patient's room.

If it becomes necessary to place patients with probable or diagnosed influenza in the same room with asymptomatic patients, emphasis should be placed on maximizing their physical separation (at least 1 meter distance and greater, if possible).

All patients should remain on droplet precautions for a minimum of seven days following symptom onset in addition to maintain in droplet precautions until 24 hours following resolution of acute influenza symptoms, particularly fever.

Once the patient vacates a room, others patients should not be allowed in that room until sufficient time (at least 48 hours) has elapsed for enough air changes to remove potentially infectious particles. In addition, the room should undergo appropriate cleaning and surface disinfection before susceptible individuals are allowed to reenter it, for next case management.

Precautions for Aerosol-generating Procedures: These procedures should only be performed if they are medically necessary and cannot be postponed. The number of health care personnel during the procedure should be limited to only those essential for patient care and support. The procedure should be conducted in an AIIR when feasible. Room doors should be kept closed except when entering or leaving the room, and entry and exit should be minimized during and shortly after the procedure.

Management of visitor access and movement within the facility: Visits to patients in isolation should be

scheduled and controlled. Facilities should provide instruction before visitors enter patients' room on hand hygiene, limiting surfaces touched, and use of personal protective equipment (PPE) according to the facility policy. Visitors should be instructed to limit their movement within the facility and exposed visitors should be advised to report any signs and symptoms of acute illness to their health care provider for a period of at least 10 days after the last known exposure to the sick patient.

Monitoring activity of Severe Respiratory Infection in the Healthcare Setting: Health care personnel should be alerted the about increased respiratory illness activity or outbreak within the facility. Procedures to identify health care personnel at highest risk should be established and they should be actively followed for acute respiratory illness. All health care personnel should be encouraged to self-report acute respiratory illness. Communication and collaboration with public health authorities is essential.

Prevention

Vaccination: Inactivated influenza Vaccine

Distance Maintenance: Maintain a distance of at least 1meter from the confirmed or suspected person with influenza.

Self-isolate: 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.

Seek Immediate Medical Attention: Patients who have difficulty breathing or shortness of breath or who are believed to be severely ill should be encouraged to seek immediate medical attention.

Use of Face Mask: Patient 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.

Precaution in Home Isolation: While in home isolation, patients and other household members should be given infection control instructions, including frequent hand washing with soap and water. Use of alcohol-based hand gels (containing at least 60% alcohol) when soap and water are not available and hands are not visibly dirty is acceptable. Patients with H1N1 influenza should wear a face mask when within 6 feet of others at home. Designate a single household family member as caregiver for the patient to minimize interactions with asymptomatic persons.

Social Distancing: Large gatherings linked to settings or institutions with laboratory-confirmed cases should be canceled. Persons with underlying medical conditions who are at high risk for complications of influenza should consider avoiding large gatherings.

Prognosis

The 2009 influenza pandemic caused significant economic, social, and health problems. Although the number of deaths was not high for a pandemic influenza virus, it is concerning that death rates in pregnant women and otherwise healthy young people were disproportionately high. For most people, the prognosis is good, but for a few others in whom the disease progresses more severely, the prognosis can be guarded.

Complications

Pneumonia (primary viral or secondary bacterial), bronchitis, bronchiolitis, respiratory failure, worsening of chronic diseases (heart & renal disease and asthma), neurological signs and symptoms, ranging from confusion to seizures, encephalopathy and multisystem failure

Conclusion

The patients with swine-flu like signs and symptoms should be isolated and managed aggressively. The prognosis of the disease is best when treatment is started as early as 48 hours after onset of symptoms. Co-morbidities increase the risk of death in ventilated patients. The earliest signs of deterioration of the

respiratory parameters safety early intervention with ventilator support, antiviral therapy, and good supportive treatment can protect the patient's life.

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Information for authors

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Findings of the study should be presented in logical sequence in the text as well as in the table along with descriptions. Limit the tables as far as possible (not more than five) but should provide important findings. Do not repeat the same information in the text as well all as in the tables. All the tables (Bar and line digammas) and figures should be numbered along with the complete headings.

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