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## VIEW POINT

## Swine Flu – Cardiac Involvement

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**Introduction**

Influenza accounts for 3 to 5 million cases of severe illness and up to 300,000 deaths annually [1] . Swine flu is a respiratory disease of pigs caused by type A influenza. Humans do not normally get swine flu however in past person to person spread is reported. **The 2009 outbreak of swine flu is due to new strain of virus H1N1. According to WHO estimates that up to 30% of the world's population may ultimately be affected** [2]. Since H1N1 influenza virus infection is already confirmed for possible cardiac involvement , the concern on the swine flu infection is important in cardiology. Although there is no present specific report mentioning for cardiac manifestation in swine flu and it is needed to closely monitor all infected cases for possible cardiac involvement [3].

It is contagious and spreading fast particularly among young people. Its incubation period is 2 days. Approximately 2-5% of confirmed cases in the U.S.A and 6% in Mexico have been admitted to hospital [2]. Among patient presenting with acute respiratory illness 13% tested positive for H1N1. Influenza is a recognized cause of myocarditis which can lead to significant impairment of cardiac function and mortality. With recent concerns regarding another potential global pandemic of influenza the huge potential for

cardiovascular morbidity and mortality. Real cardiac risk in swine flu is not new cases of myocarditis but exacerbation of symptoms in previous heart failure patient.

**How Fatal Is New H1N1?**

As of 20 may 2009, 10243 laboratory confirmed cases of H1N1 infection, including 80 deaths from 41 countries. Case fatality is less than 1 %. Most fatalities are occurring in some specified sub groups.

**Who Is More At Risk [5]**

Heart Failure [HF] hospitalizations account for a substantial portion of the overall costs of caring for patients with HF and may be associated with a staggering degree of morbidity and mortality, particularly in the elderly population. It is evident that the prognosis after an index hospitalization for HF is ominous, with a 50% rate of re-admission at 6 months and a 25% to 35% incidence of death at 12 months [4]. World wide heart failure affects nearly 23 million people. It is this population of heart failure patients who are at the real risk of swine flu related hospitalization and mortality

1. Infants and aged ( >65 years ).
2. Persons with asthma or other chronic pulmonary diseases, such as cystic fibrosis in children or chronic obstructive pulmonary disease in adults.
3. **Persons with hemodynamically significant cardiac disease.**
4. Persons who have immunosuppressive disorders (HIV) or who are receiving immunosuppressive therapy
5. Persons with sickle cell anemia and other hemoglobinopathies.

6. Persons with chronic renal dysfunction, cancer, diabetes mellitus.
7. Persons with neuromuscular disorders, seizure disorders, or cognitive dysfunction that may compromise the handling of respiratory secretions

### How does H1N1 affect Cardiovascular System?

Epidemiological studies have demonstrated an association between influenza epidemics and cardiovascular mortality. Cardiovascular involvement in acute influenza infection can occur through direct effects of the virus on the myocardium or through exacerbation of existing cardiovascular disease. Influenza is known to cause myocarditis. A total of 9 cases of influenza myocarditis were diagnosed during the winter epidemic of influenza 1998-1999 [6]. The mean age of the patient was 52±18 years. Cardiac involvement occurred between 4 and 7 days after the onset of influenza symptoms. All patients had preceding flu-like symptoms and fever. Worsening dyspnea was the most common symptom. Out of the 9 cases five were examined. Dyspnea progressively worsened in three patients, one went into shock and one had persistent fever, cough and mild dyspnea without apparent cardiac symptoms. One patient died of pneumonia following cerebral infarction, but the left ventricular dysfunction normalized in the remaining four patients. Three patients had ST elevation associated with Q waves and one had complete left bundle branch block. The creatine kinase levels were abnormally increased and global wall motion of the left ventricle on echocardiography was decreased in all patients. Electrocardiography, echocardiography and creatine kinase levels should be checked to determine the potential for cardiac involvement when patients present with suspected influenza associated with worsening dyspnea or prolonged weakness.

### The Diagnosis Of Influenza Myocarditis ?

- At least a four-fold increase in influenza A virus titers using paired sera
- Increased creatine kinase levels
- ECG abnormalities- ST elevation with Q wave and LBBB.
- Echo- Global hypokinesia of left ventricle.

### Treatment

#### For What Purposes Can Antiviral Drugs Be Used Against Influenza A(H1N1)?

So far most people who have contracted the new A (H1N1) virus have experienced influenza-like symptoms (such as sore throat, cough, runny nose, fever, malaise, headache, joint/muscle pain) and recovered without antiviral treatment. Antiviral drugs may reduce the symptoms and duration of illness, just as they do for seasonal influenza. They also may contribute to preventing severe disease and death. Influenza A (H1N1) is a new virus and only a small number of people with the infection have been treated for it with antiviral drugs.

Detailed information regarding antiviral therapy in these patients is not currently available, but use of oral Oseltamivir in those with serious illness or pneumonia may be beneficial. Delay to initiation of antiviral therapy is likely an important factor in poor outcomes [2]. Among 27 fatal cases in Mexico, the median time from onset of symptoms to initiation antiviral therapy was 8 days (range, 1–26 days). Neuraminidase inhibitor such as Oseltamivir ( 75 mg twice daily for 5 day) and Zanamivir (10 mg twice daily must be given by oral inhalation device ) are the main stay of antiviral treatment. Zanamivir precipitates bronchospasm, thus it should be avoided with pt with predominantly presenting with bronchospasm. In patients of fulminant myocarditis, use of inotropic drugs and intra aortic ballon counterpulsation (IABP)

should be done and steroids use is discouraged.

### Vaccination

Vaccines are under trial phase for swine flu and as soon as vaccines will be available for clinical use they should be used in high risk population as described earlier. Approximately 15% of patient with acute heart failure episodes are precipitated by infections. Epidemiological studies have demonstrated an association between influenza epidemics and cardiovascular mortality<sup>1</sup>. Real cardiac risk in influenza is not new cases of myocarditis but exacerbation of symptoms in previous heart failure patient. Influenza vaccines have been able to significantly reduce the severity & duration of illness & thus improve survival. Vaccination should be considered in patients with symptomatic heart failure without known contraindication [4].

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