Influenza H1N1 - Revisited

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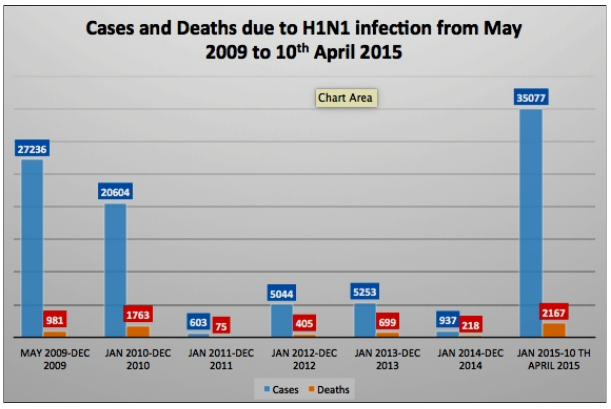
Deadly 1918 influenza pandemic was the first of the two pandemics involving H1N1 influenza virus. It infected 500 million people across the world in three waves and killed 50 to 100 million of them, making it one of the deadliest natural disasters in human history. In April 2009, human infection with a new strain of this virus was confirmed in Mexico and within weeks, the infection had spread to other parts of the world. Hardest hit regions were Southeast Asia and Africa. World Health Organization (WHO) declared this new strain of swine-origin H1N1 as a pandemic. Later on August 10, 2010, the WHO declared the H1N1 influenza pandemic over, stating that worldwide flu activity had returned to typical seasonal patterns. In the ensuing years since the 2009-10 pandemic, both case and death burden had remained fairly stable and manageable[1]. However in India we witnessed the resurgence of H1N1 influenza in the first quarter of 2015 with the worst kind of infection and fatalities.



In India the H1N1 virus had killed 981 people in 2009 and 1763 in 2010. The mortality decreased in 2011 to 75. It claimed 405 lives in 2012 and 699 lives in 2013. In 2014, a total of 218 people died from the H1N1 flu. As on 15th April 2015, the number of people affected in India has been over 35,077 and a death toll of 2167 in the first three and half months of 2015 itself[2]. The worst affected States have been Gujarat and Rajasthan. Maharashtra had 4075 positive cases with 478 deaths till 20th April'15. 594 cases were positive in Nagpur region with case fatality of 120. In the original article published in this issue of VJIM, Government Medical College, Nagpur witnessed 156 admissions of H1N1 positive patients, all in Category C of which 86 were direct admissions and 70 were referred patients after admissions outside. Patients presenting after 5 days of symptom onset had a mortality of 43% as compared to 27% in those presenting within 5 days of symptom onset. Young and economically productive age group has been the most affected. Of the referred patients the mean duration of hospitalization outside was 2.05 days in Survivors as compared to 3.98 days in Non-Survivors (p=HS). The mortality observed in direct admissions was 24% as compared to 45% in referred patients. 66.66% of patients affected had co-morbid conditions like diabetes, hypertension, IHD, obesity and pregnancy[3]. So a high mortality rate was observed even in patients who reported early in the disease course.

Swine flu causing influenza A virus appears as three strains : H1N1, H2N2 and H3N2. Researchers from MIT, USA had proposed that the H1N1 strain currently circulating in India seems to have acquired genetic mutations (in the haemagglutinin glycoprotein structure) in the past 2 years thereby rendering it more serious and infectious. However, officials from the National Institute of Virology, Pune have clarified that no such mutation has occurred. H3N2 strain has been responsible for 99.8% of flu cases in the United States this year[4].

The H1N1 virus is a contagious virus, which infects nose, throat, and lungs. It is an RNA virus belonging to the Orthomyxoviridae family. It is typically

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contracted by person-to-person transmission through respiratory droplets. The virus can also be passed through contact with objects the infected person has touched, such as a door handle or other surfaces.

The symptoms of H1N1 flu are similar to those of other influenzas, and may include fever, cough (typically a "dry cough"), headache, muscle or joint pain, sore throat, chills, fatigue, and runny nose. Pain in abdomen, vomiting and diarrhea has also been reported in some cases. Virus may invade the lower airway and alveoli, not just the upper airways, resulting in breathlessness, bronchopneumonia, ARDS and respiratory failure leading to severe morbidity and mortality[2].

People at higher risk of serious complications include those aged over 65, children younger than 5, children with neurodevelopmental conditions, pregnant women (especially during the third trimester) and those of any age with underlying medical conditions, such as asthma, diabetes, obesity, heart disease, or a weakened immune system (e.g., taking immunosuppressive medications or infected with HIV). About 60% of hospitalizations are in people with such underlying conditions. Symptoms usually last 46 days.

Antivirals (oseltamivir or zanamivir) are recommended for those with more severe symptoms or as prophylaxis for those in an at-risk group. On 19th December 2015, the U.S. Food and Drug Administration approved Rapivab (peramivir) to treat influenza infection in adults, aged 18 and older. However it is not available in Indian Market.

Treatment with antiviral drugs can make the illness milder and shorter. Treatment with antivirals also can lessen serious flu complications that can result in hospitalization or death.

Confirmed diagnosis of H1N1 influenza requires testing of a nasopharyngeal, nasal or oropharyngeal tissue swab from the patient. Real time RT- PCR is the recommended test. However, most people with symptoms do not need a test for H1N1 flu specifically, because the test results usually do not affect the recommended course of treatment. The U.S. CDC recommends testing only for people who are hospitalized with suspected influenza, pregnant women and people with weakened immune systems.

Guidelines had been posted on the website of Ministry of Health and Family Welfare dividing the patients into 3 categories, with recommendations to test and hospitalize category C patients.

Seasonal Influenza A (H1N1) Guidelines on Categorization of Seasonal Influenza A H1N1 cases during screening for home isolation, testing, treatment and hospitalization [5].

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Categories

A	B1	B2	C
Patients with mild fever plus cough / sore throat with or without bodyache, headache, diarrhoea and vomiting	In addition to all the signs and symptoms mentioned under Category-A, if the patient has high grade fever and severe sore Throat	In addition to features of Cat-A, individuals having one or more of the following high risk conditions : • Children with mild illness but with predisposing risk factors • Pregnant women • Persons aged 65 years or older • Patients with - ‣ Lung diseases, ‣ Heart disease, ‣ Liver disease, ‣ Kidney disease, ‣ Blood disorders, ‣ Diabetes, ‣ Neurological disorders,	In addition features to Category-A and B, if the patient has one or more of the following : • Breathlessness, chest pain, drowsiness, hypotension, hemoptysis, cyanosis • Children with somnolence, high and persistent fever, inability to feed well, convulsions, shortness of breath, difficulty in breathing • Worsening of underlying chronic conditions

		‣ Cancer, ‣ HIV/AIDS, ‣ Long term cortisone therapy.	
Action Recommended			
No testing No Oseltamivir Treat symptomatically Home isolation Reassess after 48 hrs.	Home isolation May need Oseltamivir No testing required	Home isolation Give Oseltamivir No testing required Broad-spectrum antibiotics where required	Immediate hospitalization Start Oseltamivir Send throat swab

The influenza vaccine is available as injectable (killed) or nasal spray (live attenuated). Vaccinated persons are 60% less likely to need treatment. Vaccine offers protection against the 3 strains of influenza (flu) most likely to circulate i.e.

- an A/California/7/2009 (H1N1)pdm09-like virus
- an A/Texas/50/2012 (H3N2)-like virus
- an B/Massachusetts/2/2012-like virus.

The vaccine takes 2 weeks to work and effect lasts for about 12 months. Obviously, prevention through immunization should remain our top priority specifically of the vulnerable and at-risk groups. The injectable vaccine is safe for pregnant women and can be administered during any pregnancy trimester. For ongoing protection a new vaccine is required each year before the influenza season usually in the month of October.

Separating the mother and newborn in the immediate postpartum period may substantially reduce the risk of droplet exposure and infection during a period when the newborn has little immune protection. Immediately following delivery, the mother should be assisted and supported to express her milk/colostrum. The mother's milk should be fed to the newborn by a healthy caregiver until criteria are met for close contact. Antiviral chemoprophylaxis of the infant is currently not recommended, due to limited data on safety and efficacy.

Post-exposure prophylaxis entails giving oseltamivir to exposed persons before the symptoms develop, and the effectiveness of oseltamivir in preventing influenza in household contacts and health care workers has been proved. It can be given for a period of up to 6 weeks or till 10 days after the last exposure. However indiscriminate use of oseltamivir increases the risk of development of oseltamivir-resistant H1N1 virus and is discouraged. Emphasis has to be laid on vaccination, infection control procedures, use of personal protection equipment, hand washing and designing a policy of enhancing social distancing[6].

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