



**CLINICAL SPECTRUM AND OUTCOME OF SUSPECTED AND PROVED H1N1 CASES  
IN A TERTIARY CARE HOSPITAL**

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**ABSTRACT**

**Introduction:** Swine-origin influenza virus is the strain of the influenza family of viruses that is endemic in pigs. The first pandemic of influenza occurred in 1918. It was attributed to human H1N1 virus & affected 500 million persons worldwide. The current virus is a remnant of the 1918 virus, first detected in 2009. **Objective:** To study the clinical spectrum and outcome of patients of suspected or confirmed H1N1 influenza. **Materials and Methods:** Detailed history & examination was done in patients aged above 18yrs with suspected H1N1 influenza (CDC criteria). They were divided into 4 categories (A, B1, B2 and C) as per Ministry of Health & Family Welfare Guidelines.<sup>[2]</sup> Patients belonging to B2 & C category were included in the study & throat swab examination was sent in Cat C patients & both the group patients were started on antiviral treatment (Oseltamivir). **Results:** Total of 75 cases were included in the study of which 36% were males & 64% were females. 90% (68) patients presented with fever, 76% (51) had cough, 60% (45) with breathlessness, 73% (55) had rhinorrhea, 59% (44) had sore throat, 18% (14) with diarrhoea, 74% (56) presented with headache. 76% (56) showed B/L pneumonia on CXR. 24% (18) had h/o exposure. 22% were positive for H1N1. 33 patients (44%) had 1 or more co-morbid condition. Diabetes was the most common risk factor. Mortality was seen in 13% (10 patients of which 6 patients tested positive for H1N1 and 4 were negative). The deaths were due to complications like B/L pneumonia with ARDS & MODS. **Conclusion:** Identifying the symptoms & co morbidities & early initiation of antiviral therapy reduces the mortality & morbidity. Hand hygiene, cough etiquette and maintain safe distance (minimum two feet) from infected patients reduces the transmission. Prevent overcrowding and Use of personal protective measures reduce easy spread of infection.

**KEYWORDS:** Swine-origin influenza (Oseltamivir). rhinorrhea, criteria).

**INTRODUCTION**

Influenza virus is a common human pathogen, and is responsible for serious respiratory illness and death over the past century. It always has potential to cause widespread pandemics whenever a new type of Influenza strain appeared in the human population and then spread easily from person to person. Swine flu is a highly contagious respiratory disease transmitted to humans via contact with infected pigs or environments contaminated with swine influenza viruses. The 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. In June 2009, the World Health Organization (WHO) declared this new strain of swine-origin H1N1 as a pandemic. This novel virus had caused about 17,000 deaths by the start of 2010.<sup>[1]</sup> In 2015 the instances of Swine Flu substantially increased to five year highs with over 10000 cases reported and 660 deaths in India.<sup>[4]</sup> The states reporting the highest number

of cases and deaths are Rajasthan, Gujarat, Madhya Pradesh, Maharashtra, Delhi and Telengana. The current virus (2015) is a remnant of the 1918 virus, first detected in 2009, is a descendant of the 1918 virus causing the pandemic of 2009-2010.<sup>[2]</sup>

**OBJECTIVE**

To study the clinical spectrum and outcome of patients of suspected or confirmed H1N1 influenza.

**MATERIALS AND METHODS**

This is a prospective study conducted from January 2015 to April 2015. Patients aged above 18yrs with suspected H1N1 influenza as per CDC Criteria were included in the study.

**The CDC criteria for suspected H1N1 influenza are as follows**

- 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.

Detailed history & examination was done in these patients & were divided into 4 categories (A, B1, B2, C)

as per Ministry of Health & Family Welfare Guidelines.<sup>[1]</sup>

Patients belonging to B2 & C category were included in the study & throat swab examination was sent in Cat C patients. Real-time polymerase chain reaction (RT-PCR) test done on throat swab specimens & both the group patients were started on antiviral treatment (Oseltamivir) along with other required interventions.

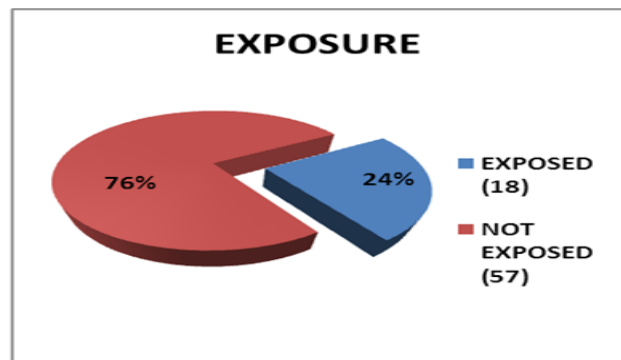
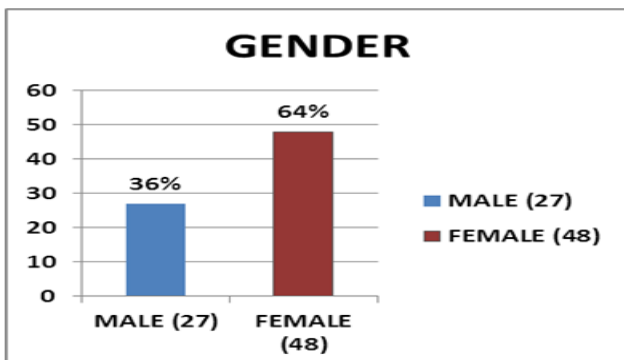
These patients were closely monitored & all the data collected were entered in the proforma & processed for statistical analysis.

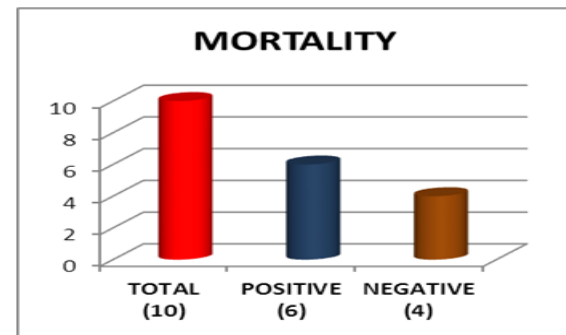
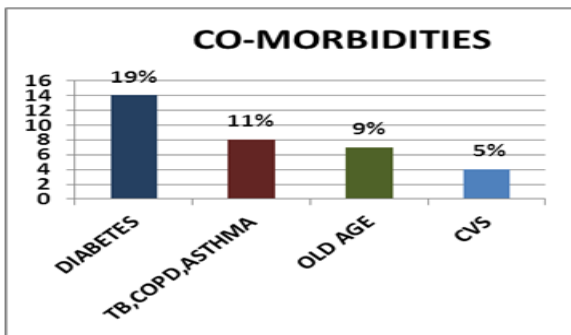
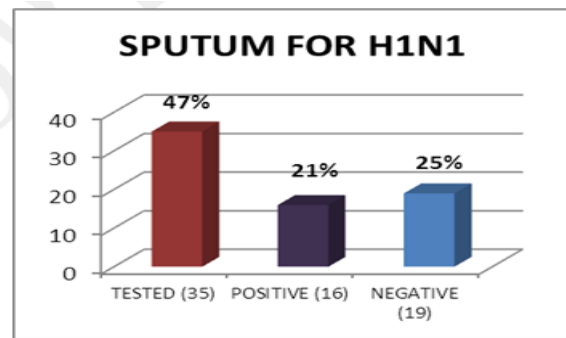
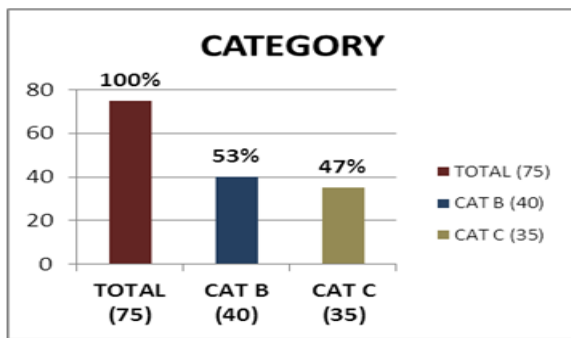
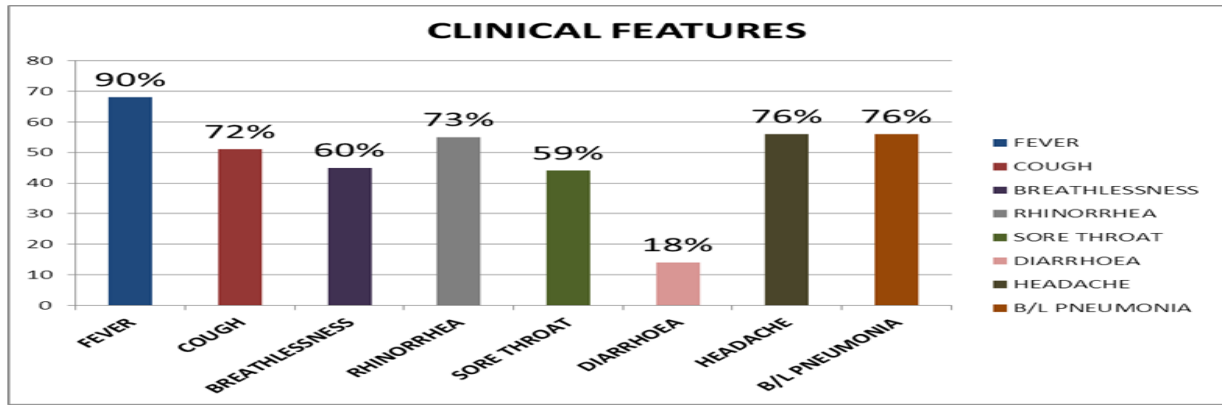
Ministry of Health & Family Welfare Guidelines on categorization of Seasonal Influenza A H1N1 cases during screening for home isolation, testing, treatment and hospitalization			
A	B1	B2	C
Patients with mild fever plus cough / sore throat with or without bodyache, headache, diarrhea and vomiting	In addition 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, cancer and HIV/AIDS Patients on long term cortisone therapy	In addition features of 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
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

**RESULTS**

The study included 75 patients of either confirmed or suspected H1N1 patients (Cat B2 & C). 27 were males (36%) and 48 (64%) female patients. Mean age is 36 years. 4 (5%) presented within 2 days, 40 (53%) patients within 3-5 days, 21 (28%) between 6-7 days, 10 (13%) after 10 days. 90% (68) patients presented with fever, 76% (51) had cough, 60% (45) with breathlessness, 73%

(55) had rhinorrhea, 59% (44) had sore throat, 18% (14) with diarrhoea, 74% (56) presented with headache. 76% (56) showed B/L pneumonia on CXR. 24% (18) had h/o exposure. 22% (16) turned positive for H1N1, 54% (40) belonged to Cat B & 46% (35) belonged to Cat C. 29% (22) required mechanical ventilation. Mortality was seen in 13% (10 patients of which 6 patients tested positive for H1N1 and 4 were negative).





**DISCUSSION**

The 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, 3-5% of the world’s population, making it one of the deadliest natural disasters in human history.<sup>[2]</sup>

The present study was aimed to assess the clinical and radiological profile, factors determining the response, prognosis of the disease and outcome in H1N1 positive patients so that epidemiology of the disease could be known and high risk groups can be identified.

Seasonal influenza commonly starts during pre-winter period and ends as summer sets in, that is during the months of August to March in South Asian region. But 2015 pandemic began increasing in early December and as of early March, Flu remained widespread across the world. Prolonged winter, unseasonal rains, inadequate hygiene, crowded urban infrastructure have compounded the problem for us.

Seasonal influenza commonly affects old age people, while the 2015 H1N1 influenza significantly impacted young people. In our study, most were between 25 and 45 years of age (mean age 35 years). A study conducted by Borse RT et al, also showed that it affected younger people with mean age of 33.43 yrs.<sup>[4]</sup>

Most common presenting features were fever with headache, cough with breathlessness, rhinorrhea. 76% of admitted patients with H1N1 disease presented with bilateral non homogenous opacities in chest X-ray PA view. A study conducted by Monika Maheshwari et al,<sup>[5]</sup> Puvanalingam et al<sup>[6]</sup> & Novel Swine-Origin Influenza A (H1N1) Virus Investigation Team<sup>[7]</sup> also showed similar predominance of clinical features and bilateral lung involvement on X ray.

44% had one or more co-morbid condition and the severity of the disease was more in these patients. Diabetes was the most common risk factor found in 17 patients (22%), followed by chronic pulmonary diseases namely, COPD/bronchial asthma/pulmonary tuberculosis

and mortality was more among the patients with Co morbidities. A study conducted by Raman Sharma et al, also showed similar incidence of co morbidities and more incidence of mortality among them.<sup>[2]</sup> Seema Jain et al also showed increased mortality among patients with co morbidities.<sup>[8]</sup>

All patients included in the study were started on Oseltamivir. 22 patient required ventilator support & 30 patients required non invasive ventilator support. In spite of aggressive management mortality was seen in 13% and most of the deaths were seen in the patients who presented 3-5 days after initiation of symptoms. Mean age being 46 yrs. A study done by Surendra Kumar also showed more mortality among the patients presented within 3 days and mean age of 44.69 yrs.<sup>[9]</sup>

The deaths were due to complications like B/L pneumonia with ARDS & MODS. A study done by Surendra Kumar also showed B/L pneumonia with ARDS & MODS as the most common cause of death.<sup>[9]</sup>

### CONCLUSION

- With the above observation, H1N1 affects the young population as compared to old. Early detection of symptoms and early presentation to hospital and early initiation of antiviral treatment will help in reducing the morbidity & mortality. Patients with one or more co morbid conditions should be treated aggressively to reduce the mortality & morbidity.
- Hand hygiene, cough etiquette and maintain safe distance (minimum two feet) from infected patients, preventing the overcrowding will help in reducing the spread of infection. Early detection and home isolation/quarantine will help.
- Use of personal protective measures (N95 mask, hand hygiene measures, vaccination) will help in reducing the spread among health care professionals. Vaccine to be made a part of public health program.

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