Clinical Profile of Suspected and Confirmed H1N1 Influenza Infection in Patients Admitted at a Tertiary Care Teaching Hospital

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ARTICLE INFO	ABSTRACT
	Introduction: This study aimed to evaluate the clinical profile and outcomes of adult patients screened and diagnosed with H1N1 influenza infection at a tertiary care hospital in India.
	Materials and Methods: This retrospective study was conducted on all adult patients suspected of H1N1 influenza admitted at a teaching hospital during the epidemic period of January-March 2015. Patients were screened and classified into three categories of A, B, and C based on international guidelines. Home confinement was recommended for patients in category A, and subjects in category B received treatment with Oseltamivir capsules. In addition, patients in category C received inpatient treatment with oseltamivir capsules.
	Results: In total, 695 patients were screened for H1N1 influenza infection during the epidemic, out of whom 380 patients (54.6%) were in category A, 264 (37.9%) were in category B, and 51 (7.3%) were in category C. Throat swabs were collected and examined for 192 (27.6%) patients, and 59 (8.4%) cases were positive for H1N1 infection. **Conclusion:** According to the results of this study, close vigilance over the symptoms of patients infected with H1N1 influenza is more important than treatment and screening of suspicious cases during the epidemics of this infection. This is a retrospective cross sectional study. Hence, there were no comparative controls. The limitation of this study is, thus the lack of control.

Introduction

Influenza is considered as a threatening infection across the world and is associated with severe complications and substantial mortality rate every year (1). H1N1 is a novel strain of influenza A virus, which is evolved through genetic reassortment and is commonly referred to as 'swine flu'. The first case of swine flu was reported on 18th March 2009 in Mexico, and the infection rapidly spread throughout the world. On 11th June 2009, the World Health Organization

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(WHO) declared H1N1 as a pandemic (2-4). In India, the first case of H1N1 infection was reported in May 2009, after which the influenza pandemic started in different regions of the country.

At present, H1N1 strain of swine influenza virus has undergone triple genetic reassortment and contains genes from the avian, swine and human influenza A viruses. This strain is known to spread rapidly in the community (5). Diagnosis of H1N1 is established by reverse transcription polymerase chain reaction (RT-PCR), viral culture and increasing neutralizing antibodies. Prevention and treatment of H1N1 infection involves patient quarantine, universal precautions, infection control practices, supportive care and use of antiviral drugs (6). To date, several studies have evaluated the clinical profile of H1N1 influenza infection in India. This study aimed to present the clinical profile of swine flu among the patients admitted at a tertiary care hospital in Bangalore, India.

Materials and Methods

This retrospective study was performed at Victoria Hospital, affiliated to Bangalore Medical College and Research Institute, during January-March 2015. All patients suspected of swine flu influenza virus infection were screened during this period, and diagnosis was confirmed by collecting throat swabs using RT-PCR assay for H1N1. Moreover, patients with history of close contact with confirmed cases of swine influenza A, as well as those who recently traveled to pandemic areas, were recorded. After screening for the infection, patients were classified into the following categories according to the guidelines of Ministry of Health and Family Welfare, and WHO (7):

Category A

This category comprised of patients with mild fever and cough/sore throat, with or without body ache, headaches, diarrhea and vomiting. Patients in this group did not require Oseltamivir capsules and received symptomatic treatment. Subjects were monitored in terms of progress 24-48 hours after the treatment and were recommended to remain confined at home. Furthermore, they were advised to avoid contact with public and high-risk family members.

Category B

This category was divided into two subgroups of B1 and B2. Patients in B1 group had all the symptoms of category A subjects, as well as high-grade fever and severe sore throat. Home isolation was recommended for these patients,

and they received treatment with oseltamivir capsules.

In addition to similar symptoms to category A subjects, patients in the B2 group had one or more of the following high-risk conditions:

- Immune-compromised patients ;
- Pregnancy;
- Age range of ≥65 years;
- Pulmonary diseases, cardiovascular disorders, hepatic and renal conditions, hematological disorders, diabetes, neurological disorders, cancer and HIV/AIDS;
- Long-term cortisone therapy.

Home quarantine was recommended for all these patients, and they received treatment with oseltamivir capsules.

Category C

In addition to similar symptoms to patients in previous categories, subjects in category C had one of the following conditions:

- Shortness of breath, chest pain, drowsiness, decreased blood pressure, blood-tinged sputum, and bluish discoloration of the fingernails;
- Influenza-like illnesses in children with severe diseases, as manifested by the red flag signs (e.g., somnolence, persistent high fevers, inability to eat, convulsions, and shortness of breath)
- Deterioration of underlying chronic conditions.

Patients in category C were hospitalized and received treatment with Cap.Oseltamivir and antibacterial agents as appropriate.

Data were collected in pro forma sheets and analyzed in excel sheets.

Results

In total, 695 patients were screened for swine flu during January-March 2015. Screening was performed on all these patients, out of which 380 cases (54.6%) were in category A, 264 (37.9%) were in category B and 51 (7.3%) were in category C (Table 1). Moreover, throat swabs were examined for 192 patients and 59 cases (30.7%) were observed to be positive in RT-PCR; therefore, these patients were diagnosed with swine flu.

Table 1. Categorization of Screened and Confirmed Cases of H1N1 Influenza Infection

Category	Screened Cases N=695 (%)	H1N1 Positive N=59 (%)
A	380 (54.6)	11 (18.6)
B	264 (37.9)	20 (33.8)
C	51 (7.3)	28 (47.4)

Out of 59 confirmed cases of H1N1 influenza, the majority of patients were within the age range of 18-39 years; however, almost all the studied age groups were affected by the infection (Table 2). Furthermore, both genders were affected by H1N1 infection, with higher preponderance in the male population (Table 2). Among the confirmed cases of H1N1 influenza, 11 patients (18.6%) were in category A, 20 (33.8%) were in category B, and 28 patients (47.4%) belonged to category C (Table 1).

Out of 28 patients admitted at the hospital, 10 cases required intensive care unit (ICU) admission, and out of 59 confirmed cases of H1N1 infection, 5 patients died.

Table 2. Distribution of Age and Gender in Cases with Swine Flu

Age (Years)	Male	Female	Total
18-29	10	8	18
30-39	9	8	17
40-49	7	5	12
50-59	6	2	8
≥60	3	1	4

Table 3. Signs and Symptoms in Screened and Confirmed Cases of H1N1 Influenza Infection

Symptoms	Suspected Cases N=695 (%)	Confirmed Cases N=59 (%)
Fever	660 (94.9)	58 (98.3)
Cough	632 (90.9)	56 (94.9)
Myalgia	535 (76.9)	51 (86.4)
Sore Throat	320 (46)	32 (54.2)
Dyspnea	146 (21)	23 (38.9)
Headache	132 (19)	19 (32.2)
Vomiting	112 (16.1)	10 (16.9)
Diarrhea	56 (8)	7 (11.8)

Discussion

In the present study, 695 patients were screened for H1N1 influenza infection, out of which 59 cases were seropositive for this disease. During early April 2009, the first cases of human infection with pandemic influenza A were identified in the United States and Mexico (8-10), and the virus spread rapidly to other regions of the world (11, 12).

The H1N1 virus in the influenza pandemic of 2009 was a triple reassortment containing genes from human, swine and avian influenza virus (13-15). After documentation of human-to-human transmission of the virus in at least three countries, which were located in two of the six regions defined as pandemic areas, Pandemic degree was raised from 5 (i.e. the same identified virus has caused sustained community level outbreak in two or more countries in one WHO region) to 6 (Pandemic degree 5 plus the same virus has caused the sustained community level outbreaks in at least one other country in another WHO region) as the highest level by WHO (16).

H1N1 influenza epidemic and pandemic are of great burden to developing and underdeveloped countries since these areas are extremely vulnerable on economic and social levels. In the current study, we described the clinical profile of 695 patients screened for swine flu during January-March 2015, out of which 59 cases were microbiologically confirmed as H1N1 influenza infection. The majority of these patients were young adults, and the main cause of predisposition to the infection was probably the high mobility in this group. In the present study, gender distribution was almost equal among the studied patients. Furthermore, most of the flu cases were presented with respiratory symptoms, while atypical symptoms, such as vomiting (16.9%) and diarrhea (11.8%), were observed as well (Table 3).

Out of 695 screened patients, 264 were in category B and 51 were in category C, who received treatment with oseltamivir capsules (75 mg) twice per day, for five days. According to our observations, the majority of screened patients did not require oseltamivir treatment since only 59 out of 315 patients (Category B+ Category C) were positive for H1N1 infection. Therefore, stringent screening methodologies and generous observations are recommended in cases diagnosed with H1N1 influenza infection in order to reduce unnecessary therapies. Out of 28 patients admitted at different wards, 10 cases were in ICU, and 3 patients with ICU admission expired due to comorbid diseases, such as diabetes, obesity and HIV.

Considering the fact that H1N1 influenza is transmitted through droplet infection, preventative measures including avoidance of social interactions, adherence to respiratory etiquette, use of face masks, home confinement and preservation of hand hygiene play a pivotal role in controlling influenza epidemics (17, 18).

Conclusion

In conclusion, the findings of the present study accentuate the need for close vigilance over the symptoms of patients suspected of H1N1 influenza virus. Moreover, chemoprophylaxis and RT-PCR are recommended as the selective methods used for the prevention and diagnosis of H1N1 infection. It is also noteworthy that chemoprophylaxis should be used with caution in

patients with symptoms of H1N1 influenza as most of them had no proved infection with virus. Thereby emphasizing on home quarantine and observation. Finally, social education regarding patient quarantine should be emphasized upon in order to prevent influenza epidemics.

Conflict of Interest

The authors declare no conflict of interest.

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