Case Series Study of the Clinical Profile of H1N1 Swine Flu Influenza

A Puvanalingam*, C Rajendiran**, K Sivasubramanian***, S Ragunanthanan***, Sarada Suresh***, S Gopalakrishnan*

Abstract

Objectives: To study the clinical profile of the H1N1 influenza cases attending government hospitals in South India and to study the impact of H1N1 infection on pregnancy outcome.

Materials and Methods: A total number of 442 H1N1 positive patients (198 inpatients and 244 outpatients) from two government hospitals in Chennai, Madras Medical College & Government General Hospital and Institute of Child Health, Egmore were studied retrospectively during a period of 6 months from August 2009 to January 2010.

Results: The rate of reported cases and hospitalization rates was highest among individuals aged 5 to 24 years. H1N1 cases were equally distributed in both the sexes in the adult population. In our study, 86.92% percent of patients with pandemic H1N1 influenza A met the case definition for influenza like illness (subjective fever plus cough and/or sore throat). Similar to the western data bronchial asthma, pulmonary tuberculosis were found to risk factors for complications in H1N1 infection. The overall mortality rate was 1.8% and the most common cause of death in patients was due to pneumonia. Ventilator requirement was associated with poor prognosis in H1N1 patients. (p value <0.01). The mortality rate among pregnant women with H1N1 infection was 25% and the fetal loss rate was 16.67%. There was an increased risk of H1N1 influenza infection during the third trimester of pregnancy. (p value-0.027)

Conclusions: Individuals with comorbid conditions, pregnancy were found to be severely affected. Hence individuals with risk factors need to be protected by vaccination.

Introduction

The present pandemic of H1N1 influenza had it’s beginning in Mexico in March 2009 and soon spread to other parts of the globe in a rampant fashion. The current virus represents a quadruple reassortment of two swine strains, one human strain, and one avian strain of influenza; the largest proportion of genes coming from swine influenza viruses. On June 11, 2009, the World Health Organisation (WHO) signaled that a global pandemic of novel Influenza A (H1N1) was underway by raising the worldwide pandemic alert level to Phase 6. This was the first of the kind declared by WHO in the past 70 years. This action was a reflection of the spread of the new H1N1 virus. At the same time, more than 70 countries have reported cases of novel influenza A (H1N1) infection and there were ongoing community level outbreaks of novel H1N1 infection in different parts of the world. The pandemic started in India in the month of August 2009 and the index cases were reported from Pune. Soon the epidemic spread itself to other parts of the country. This epidemic was notoriously seen to affect the younger population in the age group of 15-40 years thereby affecting the work house of the country. Present analysis is our experience from a tertiary care referral institute admitting H1N1 positive cases. This is a retrospective study of reported cases admitted from August 09 to January 10.

Materials and Methods

A hospital based case series study was conducted in Government general hospital, Chennai and in Institute of child health, Egmore, Chennai, India retrospectively from August 09 upto January 2010. The study had ethical clearance from the institutional ethical committee. All suspected cases were confirmed by RT-PCR performed at the King institute laboratory, Guindy, Chennai. A confirmed case of pandemic H1N1 influenza A is defined as an individual with an influenza-like illness with laboratory-confirmed H1N1 influenza A virus detected by
extremes of age, H1N1 influenza cases were found to be more common in the age group 5-25 years. Few elderly individuals have been affected which might be due to preexisting immunity. Hospitalisation rate was high in the age group of 5-25 years. H1N1 cases were equally distributed in both the sexes in the adult population (male –111, female–102). But in the paediatric population there was an apparent increase in male cases. This was due to increased rate of admissions of male children when compared to female children (Tables 1, 2, 3).

Fever (95.4%) was the most common clinical manifestation followed by cough (82.32%), breathlessness (32.8%) and sore throat (26.7%). Bronchial asthma and tuberculosis were found to be risk factors for the occurrence of H1N1 influenzae (Table 4).

Pneumonia was the most common complication documented in both the adult and paediatric age group (Table 5).

Mortality rate of H1N1 influenza was found to be very high.

RT-PCR or culture. Influenza-like illness (ILI) is defined as fever (temperature of 100°F [37.8°C] or greater) with cough or sore throat in the absence of a known cause other than influenza. During this period the clinical profile of H1N1 cases was analysed with reference to age distribution, sex distribution, time distribution, clinical manifestations, risk factors, complications etc. Detailed physical examination and other investigations like complete blood count, renal function test, liver function test, ECG, chest X ray was done for all persons. Data was analyzed using statistical SPSS software and using chi square test.

### Table 1: Age-wise Distribution of Total Cases

<table>
<thead>
<tr>
<th>S. No</th>
<th>Age Group</th>
<th>Number of Cases</th>
<th>Percent-Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>0-5</td>
<td>98</td>
<td>22.17%</td>
</tr>
<tr>
<td>2.</td>
<td>5-25</td>
<td>243</td>
<td>54.97%</td>
</tr>
<tr>
<td>3.</td>
<td>25-49</td>
<td>79</td>
<td>17.87%</td>
</tr>
<tr>
<td>4.</td>
<td>50-65</td>
<td>19</td>
<td>4.29%</td>
</tr>
<tr>
<td>5.</td>
<td>&gt;65</td>
<td>3</td>
<td>0.67%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>442</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2: Hospitalised Patients

<table>
<thead>
<tr>
<th>S. No</th>
<th>Age Distribution</th>
<th>Cases Number</th>
<th>Percentage of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>0-5</td>
<td>34</td>
<td>17.08%</td>
</tr>
<tr>
<td>2.</td>
<td>5-25</td>
<td>100</td>
<td>50.25%</td>
</tr>
<tr>
<td>3.</td>
<td>25-49</td>
<td>52</td>
<td>26.13%</td>
</tr>
<tr>
<td>4.</td>
<td>50-65</td>
<td>10</td>
<td>5.02%</td>
</tr>
<tr>
<td>5.</td>
<td>&gt;65</td>
<td>3</td>
<td>1.05%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>199</td>
<td></td>
</tr>
</tbody>
</table>

### Table 3: Sex Distribution

<table>
<thead>
<tr>
<th></th>
<th>Children</th>
<th>Adult</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>144</td>
<td>102</td>
<td>246</td>
</tr>
<tr>
<td>Females</td>
<td>85</td>
<td>111</td>
<td>196</td>
</tr>
<tr>
<td>Total</td>
<td>229</td>
<td>213</td>
<td>442</td>
</tr>
</tbody>
</table>

### Results

#### Time Wise Distribution of Cases

The epidemic peaks in September and December correlated with the rains and chill climate that prevailed at that time in Chennai city. Unlike conventional seasonal flu which commonly affects the extremes of age, H1N1 influenza cases were found to be more common in the age group 5-25 years. Few elderly individuals have been affected which might be due to preexisting immunity. Hospitalisation rate was high in the age group of 5-25 years. H1N1 cases were equally distributed in both the sexes in the adult population (male –111, female–102). But in the paediatric population there was an apparent increase in male cases. This was due to increased rate of admissions of male children when compared to female children (Tables 1, 2, 3).

Fever (95.4%) was the most common clinical manifestation followed by cough (82.32%), breathlessness (32.8%) and sore throat (26.7%). Bronchial asthma and tuberculosis were found to be risk factors for the occurrence of H1N1 influenzae (Table 4).

Pneumonia was the most common complication documented in both the adult and paediatric age group (Table 5).

Mortality rate of H1N1 influenza was found to be very high.
in pregnant women than the overall mortality (Table 6).

Ventilator requirement was an independent risk factor correlating with higher mortality rate and poor prognosis in H1N1 patients. P value<0.01 (Table 7).

**H1N1 Infection and Pneumonia**

The X rays of the pneumonia patients that was analyzed showed that there was a predominance of lower lobe involvement (p value <0.01). 50% - lower lobe, 5.2% - upper lobe, 18% - middle lobe, bilaterality -100% (Fig 2). Similar findings have been observed in studies in Brazil. The predominance of lower lobe involvement was probably due to the gravitational bias in blood supply.

Pneumonia as a complication was more common in the age group of 25-49 i.e. 53.4% and it was equally reported in both sexes (men 21, women 20).

H1N1 influenza pneumonia was more commonly seen to be bilateral and it was seen to affect lower lobes of the lung (Figure 2).

**Pregnancy and H1N1 Epidemic**

H1N1 influenza infection was more common in the third trimester of pregnancy (Tables 8, 9).

H1N1 influenza occurring in pregnancy is associated with a higher mortality and more complications. P value--<0.001**.

**Discussion**

The current H1N1 pandemic had witnessed more number of cases in the age group of 5-25 years which is unusual in the conventional seasonal flu. Hospitalisation rates were more common in our study in the age group of 5-25 years but in U.S it is more common in the extremes of age group. In our study 86.92% percent of patients with pandemic H1N1 influenza A have met the case definition for influenza like illness (subjective fever plus cough and/or sore throat) whereas it was 95% in New York City.

Fever, cough, sorethroat, breathlessness were the most common symptoms observed in our population (Chart 2) with H1N1 infection which is similar to that of the U.S studies. In contrast, approximately one third of patients seen at two hospitals in Mexico had no fever at presentation.

The prevalence of certain underlying conditions was significantly higher among 198 patients requiring hospitalization for pandemic H1N1 influenza A in our study than in the general population. Bronchial asthma and tuberculosis were found to be risk factors. Seizure disorder was reported in 3% of persons, cardiac lesion was seen in 2% of persons and persons with immunosuppressive conditions accounted for 1% of the total cases. Smoking was reported in 8% of cases and alcoholism reported in 10.4% of cases (Table 4). Similar picture was observed in the United States where 32 percent of these patients had asthma compared with only 8 percent of the US population. Out of the 133 patients requiring hospitalization, 80 percent of the persons had the underlying condition that increased the risk of influenza complications. Of 272 patients requiring hospitalization in the United States, 73 percent had at least one underlying condition that increases the risk of influenza complications.

Few elderly individuals have been infected ie (0.67% in persons>65 years), which may be due to some degree of preexisting immunity in older individuals against antigenically similar influenza viruses. However, elderly individuals who are infected are still thought to be at increased risk for complications. In our study, approximately 25% (2 out of 8) of deaths caused by pandemic H1N1 influenza A virus in the study have occurred in pregnant women, although only 2.1 percent of the population is pregnant at any given time (Table 6). During prior influenza epidemics and pandemics, as well as during the current pandemic, pregnant women have had increased morbidity and mortality. The mortality rate among pregnant women in the U.S among H1N1 influenza cases has been around 28%. Similarly in our study mortality rate in H1N1 influenza in pregnancy was found to be 25%. Out of the 12 pregnant women requiring hospitalization in our study two had spontaneous abortion following intrauterine death in the third trimester. The fetal loss rate was 16.67% (2 out of 12). Similar to our analysis,
Limitation of the Study

This study was basically conducted as a retrospective study in a tertiary care institute. Hence the milder forms of the infection as well as the index case which occurred at the community level could have been missed out. Hence this analysis may not reflect the actual distribution of the cases at the population level. Further community based studies are required to analyse the actual impact of H1N1 infection in the community.

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References


**Nutritional Anemia Conference**

Nutritional Anemia Conference is organized on 12-13 March 2011 at LT M G Hospital (Sion Hospital, Mumbai. Early registration dste is 31/01/11 (Regn Fee Rs.750/-). Scientific programme, besides including various aspects of nutritional anaemia also includes effect vitamin B deficiencies on plasma homocysteine level and consequent vascular diseases including coronary artery disease and stroke. Last date for submitting abstracts is 31/01/11. Correspondence: Dr Asha Shah, 6/32, Hari Kripa Bldg., SV Road, Santacruz West, Mumbai 400 054. Mobilr 9821380093. e-mail : ashasshah@hotmail.com (MCI Credit for CME applied for)

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