



Original Research Article

One year prospective study of swine flu (H1N1) outbreak in Bhopal– 2015, Madhya Pradesh

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ABSTRACT

Introduction: Objectives of this study was to detect the incidence of Swine flu (H1N1) in Bhopal during one year period; to assess the detail gender distribution of the swine flu; to assess the distribution of disease in various age groups; to correlate with the risk factors; and to observe the trend of disease during different months.

Materials and Methods: A cross sectional observational study was done to detect the incidence of Swine Flu (H1N1) in the City of Bhopal during one year period, between 1st January 2015 to 31st December 2015.

Result: We collected a total of 2210 samples. Total 588 cases found positive for H1N1. Most patients (294) affected in age group were above 45 years, which is 64.09% of total positive cases. Subsequently, 187 patients were found to be positive in age below 11 years. Thirdly, there were 67 patients in age between 25-45 years.

Conclusion: It was observed that the male patients, particularly in his late 4th decade, fifth, sixth and seventh decade were most susceptible for swine flu (H1N1). Subsequently, quiet closely patients in their childhood were susceptible for infection with swine flu. There were certain pre-existing illness which were notorious to cause rapid deterioration, morbidity and death in these patients.

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1. Introduction

Influenza virus is a Orthomyxoviridea group of virus, and is responsible for varied spectrum of respiratory illness.¹ It start with cough, cold, myalgia, joint pain and can go on to develop atypical pneumonia, multi organ involvement and failure. It is very notorious to cause major Pandemics. It has caused six pandemics and in each pandemic it has caused severe morbidity, mortality and extreme financial burden on various nation. First Pandemic was seen in 1889, subsequently in 1918-19 second pandemic was caused by H1N1 group of Influenza virus. It caused more than 50 million deaths during that time. Subsequently, in 1958 the virus had mutated to H2N2, and caused another major pandemic and caused millions of death and morbidity all across the globe. The last major reported Pandemic was in

2009,² which was caused by H1N1 group of Influenza virus and caused major health scare with several death all over the world. In our country, we experienced severe health crisis in virtually all states. Madhya Pradesh and Bhopal was not spared of this pandemic. It is interesting to note that even in 2015,³ we are still reeling under severe swine flu crisis during its intra pandemic period. It should be noteworthy to know that it is causing equal morbidity and mortality in our city and around, even though we are not in the midst of pandemic. It is important to observe various cyclical pattern of pandemic and also determine the pattern of mutated H1N1 which is still causing problem in our country as the demography of our country and city is different from other; and we are finding it difficult to contain it even during intra pandemic phase. Following are major Pandemic and epidemic caused by Influenza virus:

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Table 1:

Years	Subtypes	Extent of Outbreak
1889-1890	H2N8	Severe Pandemic
1918-1919	H1N1	Severe Pandemic
1957-1958	H2N2	Severe Pandemic
1968-1969	H3N2	Moderate Pandemic
1977-1978	H1N1	Mild Pandemic
2009-2010	H1N1	Severe Pandemic

2. Materials and Methods

This study was an observational study done post ethical committee clearance and after obtaining consent of study subjects, at RKDF Medical College, Bhopal along with patients who were found to have symptoms suggestive of influenza virus at GMC, National hospital & Narmada hospital in the Department of Internal Medicine, Respiratory Medicine and certain selected swine flu OPD which was initiated for the screening of swine flu patient. Our study was done for a year period between 1st January to 31st December 2015. All patients from Bhopal and suburban area of Bhopal who presented in above medical centers with history suggestive of acute upper respiratory viral illness were screened. Their detailed presenting complaints, duration of illness, past medical illness, age, sex, socioeconomic detail, and other demographic history was taken in prescribed format. Samples for H1N1 was taken from nasal swab, throat swab and in serious ill patient, bronchoscopy guided BAL was taken. Sample was sent on viral transport media to our designated Virology laboratory and Real time RT-PCR was used for clinical confirmation of the presence of H1N1, at NIRTH Laboratory Jabalpur & DRDO virology Laboratory Gwalior.

2.1. Inclusion criteria

Patients who presented with history of flu, with cold, cough, fever, myalgia, for the past few days. Patients who had history of exposure with someone with swine flu in family, relative or someone who has been to a place or met a person who had similar complaints. Even patients with certain underlying risk factors were taken into consideration.

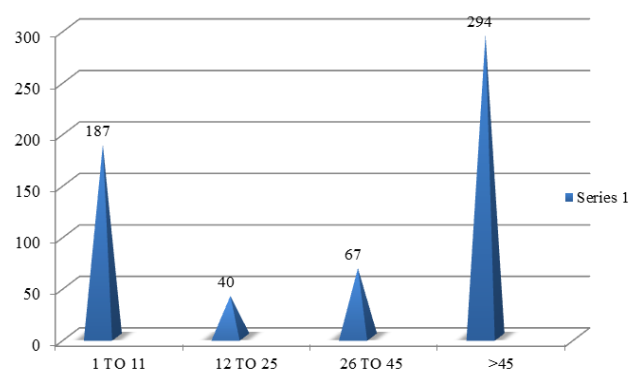
2.2. Exclusion criteria

Patients who had chronic cough for at or more than 15 days, history of chronic pulmonary disease such as tuberculosis, interstitial lung disease, chronic obstructive lung disease without sign or symptom of acute viral illness. Smokers cough, Bronchiectasis, Left ventricular failure, allergic cough and Bacterial pneumonias.

3. Result

3.1. Age distribution

We collected a total of 2210 samples; patients were examined during twelve months period from 01 January to 31 December 2015. Total 588 cases found positive for H1N1. Most patients (294) affected in age group were above 45 years, which is 64.09% of total positive cases. Subsequently, 187 patients were found to be positive in age below 11 years. Thirdly, there were 67 patients in age between 25-45 years. There were 40 patients in age group between 12-25 years. Presence of underlying risk factors was an important contributing factor. So it was observed that majority of patients infected with swine flu were either in age group below 12 years or above 45 years.

**Fig. 1:** Age and H1N1 association

3.2. Gender distribution

As we look at the gender distribution of H1N1, amongst the various group; it was observed that, there were 98 male and 89 females who had H1N1 below the age of 12 years. Then in second to fourth decade, the incidence was less for the infection with 23 males and 17 females positive between 12 to 25 years and 33 males and 34 females were positive for H1N1 between 26 to 45 years of age. Subsequently, after 45 years the incidence of H1N1 increased significantly with 170 male and 124 females positive for H1N1. It was significant to notice that the incidence of H1N1 is very high in the extreme of age, whether it is below 12 year or above 45 years. Males were slightly more affected than females. While, the incidence was relatively less during second decade, third decade and first half of fourth decades. There were 324(55%) Males who had H1N1 while 264(45%) females were positive for H1N1 in our study. So we can gather from above study that males were slightly more affected than females.

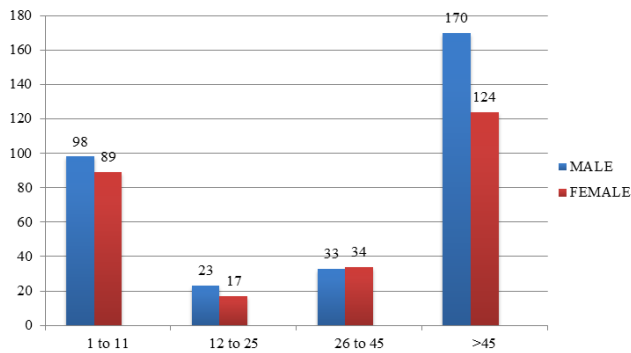


Fig. 2: Gender and H1N1 distribution

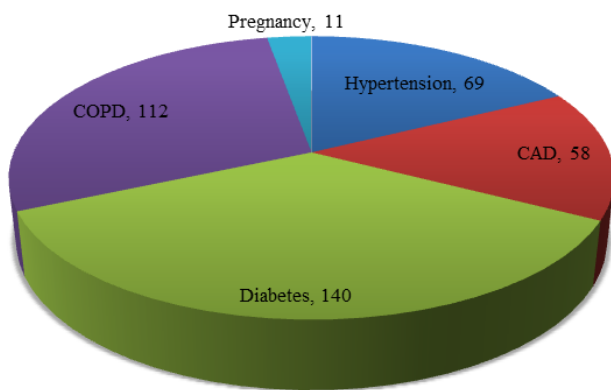


Fig. 3: Risk factor in H1N1 patients

3.3. Risk factors association with Swine flu

In this study, there were around 390 patients (67%) had some form of co-existing risk factors, 198 patients (33%) had no risk factors which are known to cause immune suppression (Figure 4). Following are the important risk factors were found in our study patient group: Diabetes, chronic pulmonary diseases namely, COPD / bronchial asthma, coronary artery diseases, pregnancy, hypertension and hypothyroidism were main comorbidities. In our study it was noteworthy that there were significant risk factors observed in H1N1 positive patients, and they somehow determine the course of illness, morbidity and mortality of the patients. Patients with history of Diabetes, chronic obstructive lung disease and pregnancy carried more severe and adverse outcome including mortality of the patients infected with H1N1. In our study, there were 140 patients with coexisting Diabetes, 112 patients had chronic obstructive lung disease, 58 patients had underlying Coronary artery disease, 69 patient had Hypertension and 11 females were Pregnant All patients were started Oseltamivir 75 mg twice a day. It was observed that the patients who were started on Oseltamivir early in the course of illness, who were relatively devoid of risk factor, responded well to the treatment. On the contrary, patients with risk factors had

worse outcome.

3.4. Month wise distribution of Swine flu

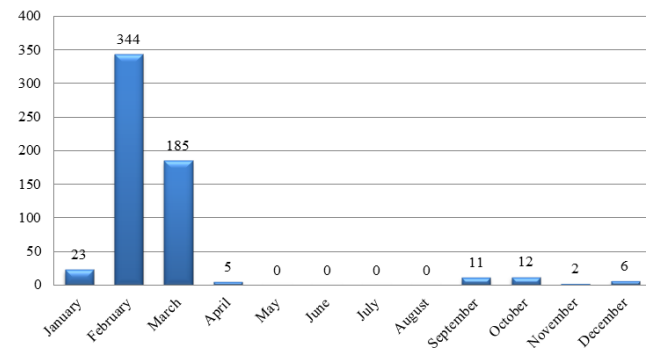


Fig. 4: H1N1 infection during various months 2015

It was observed that there were 23 cases detected in the month January, then in the month of February there was huge explosion in the number of cases with around 344 patients who were found to be positive. The severe incidence of new cases continued in the month of March with 185 patients who were tested positive with H1N1. By April the cases had bottomed out to around 5 positive patients in April. Then there was a period of nadir when there were no cases detected in next four month from May, June, July and August. Then again in the month of September there was resurgence of H1N1 with 11 cases. Subsequently, in the month October there were 12 cases of H1N1, 2 cases in November and 6 cases in the month of December. So it was observed that there more number of H1N1 patients who were found to be positive at the initial and later half of the year, while there were very few or no cases in between the year.

4. Discussion

It was observed in some other studies that the prevalence of Influenza A (H1N1) was high among children and young adults, in our study we found elderly people were more prone and subsequently children below 12 year were affected. Elderly patient with underlying co existing disease were more prone for adverse outcome.⁴ This subset of patients would go on to develop more complication and will have more morbidity and mortality. In our study, there were 588 patients who were found to be positive for H1N1 by RTPCR. Amongst them, 324 patients were male and 264 were female. We observed that more patients who had H1N1 infection belonged to age below 12 years and those above 45 years. There were 187(32%) patients below 12 years and 294(50%) patients who were above 45 years of age. So, it can be inferred that around more than 75% of patients belonged to age below 12 years and above 45 years.

All these patients were started on Oseltamivir.⁵ On the day of admission or prior to admission, but the outcome was variable and most of the time it was dependent on underlying risk factors, age of patient, stage at which the patient consulted the doctor first. It is important to observe that H1N1 is highly infective during initial 2-5 days and if we intervene during this period to prevent spread and quarantine the patients and treat them adequately at this period; we normally tend to have favorable outcome.

In our study following were the important underlying risk factors which determined the outcome of disease, morbidity and mortality; diabetes was seen in 22%, chronic lung conditions (Chronic Bronchitis/Emphysema/Asthma) in 18%, pregnancy in 7%, coronary artery disease (old myocardial infarction with LV dysfunction/unstable angina/various stage of left ventricular failure) was found in 9% and hypertension was found in 11%.

We have done our study in the city of Bhopal and its patients from suburban areas during one year period between 1st January 2015 to 31st January 2015. The important and noteworthy aspect of our study is that the H1N1 Influenza has high propensity for patients in the extreme of the age group such as children and elderly patients. Patients with underlying immuno-compromised existing diseases were more prone for rapid progression and deterioration including death. In our study, we had slight preponderance for elderly male patients who belonged to lower socio economics strata from suburban areas.

5. Conclusion

In our study there were certain striking features, which we observed. Firstly, it was observed that the male patients, particularly in his late 4th decade, fifth, sixth and seventh decade were most susceptible for swine flu (H1N1). Subsequently, quiet closely patents in their childhood were susceptible for infection with swine flu. There were certain pre-existing illness which were notorious to cause rapid deterioration, morbidity and death in these patients. Most important among them were pre-existing Pulmonary or Lung parenchymal disease such as chronic lung diseases (COPD, Bronchial asthma, old treated Koch's, cardiac diseases (coronary artery disease), Diabetes, Pregnancy etc. It was important to note that pregnancy in females was major cause for increase morbidity and mortality. As a matter of fact the fatality was very high in females with pregnancy. This observation can be used to do aggressive screening, assessment and follow-up of this susceptible age group and we can target them to vaccinate with current strain of vaccine to prevent major illness in this age group.

Secondly, Diabetes was also major risk factor for a patient to acquire swine flu and subsequently the morbidity and mortality was also high in this group of patients. It was important to observe the socio economics condition,

personal habit and hygiene contributed significantly in determining the initiation and course of disease. It was seen that majority of these patients belonged to relatively compromised economic strata. Patients with poor personal hygiene and habits were more susceptible for swine flu. Overcrowding in poor socioeconomics condition, chronic smoker, and tobacco chewer with bad personal hygiene habits made a person more prone to develop swine flu and then go on to develop morbidity and mortality with the history of certain immune compromised states as discussed above. So it forms a bases to educate to have good habits, excellent personal hygiene like washing hand regularly, avoiding unnecessary contact with susceptible person and in public generally, avoid smoking and tobacco in every form will help in reducing the severity of incidence and propagation of swine flu.

We need to have highly effective H1N1 screening center at grass root level (Primary Health Center/Community Health Center / District Hospital), where patients who belong to group A, B can be started on Oseltamivir⁶ and depending on the severity of infection with co morbid risk factors, were referred timely patients who fall in group C. In category C patients can present with respiratory distress, tachypnea, cyanosis, hemodynamic compromise with underlying risk factors to a suitable identified tertiary health center.

6. Source of Funding

None.

7. Conflict of Interest

None

8. Acknowledgment

None.

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