

Epidemiological profile of Influenza - A (H1N1) patients screened at a tertiary care hospital in Western India

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Abstract

Introduction: Swine flu influenza A (H1N1) has been one of the major public health problems in India. So this study was conducted to study the epidemiological profile of Influenza -A (H1N1) patients screened in SSG hospital Vadodara.

Materials and Method: A secondary data analysis was conducted for patients screened for H1N1 during 01/08/2009 to 04/10/2010 in tertiary care government hospital, Shree Sayaji General Hospital Vadodara, Gujarat. All the relevant patients' details were entered in Microsoft excel worksheet. Data was analysed using Epi Info software.

Results: Total number of patients screened was 2440. Of which H1N1 positive patients were 245(10.0%). It was more commonly seen among age group 20 to 30 yrs and more among males (54%) as compared to females (46%). Among H1N1 positive females, 6 were pregnant and out of them 3 pregnant females died. Maximum patients were screened and found to be positive during winters (January and February). CFR (Case Fatality Rate) was found to be 14.7%. CFR among males (16.5%) found to be higher than among females (14.5%) and CFR is highest in 50 to 60 yrs age group.

Conclusion: The epidemiological trend of H1N1 patients screened at SSGH showed peaks during winter months and once again showing rising trend from August 2010, which may be a clue to what to expect in winter of 2010. Among pregnant females it is difficult to comment about mortality due to H1N1 morbidity but this cross sectional study gives us a research idea of association between H1N1 status and pregnancy.

Keywords: Epidemiology, H1N1, Influenza-A, Vadodara, India

Introduction

Influenza is a major threat to public health throughout the world, which stressed critical care delivery systems with an onslaught of patient with severe, life threatening respiratory failure and death each year.⁽¹⁾ In April 2009, the new strain of Influenza virus was identified called H1N1 (novel influenza) virus, circulating in North American pigs. The 2009 flu pandemic caused by Influenza A (H1N1) virus is commonly referred to as Swine Flu. It is declared as pandemic since 2009. The first case of this disease was reported in Mexico on 18th March, 2009. Subsequent international spread led World Health Organization (WHO) to declare pandemic Phase-6 for this Novel influenza on 11th June, 2009. In India, also slowly the number of cases has increased to a great extent. India has the highest mortality rate due to swine flu (nearly 2.3%) posing a major public health problem in recent scenario.⁽²⁾

Influenza A (H1N1) has high risk of transmission (20%-30%) and affects mainly young and healthy adults (20-60yrs). According to the writing committee of WHO, in humans the symptoms of the 2009 "swine flu" H1N1 virus are fever; cough, sore throat, watery eyes, body aches, breathlessness, headache, weight loss, chills, sneezing, runny nose, coughing, lack of appetite and fatigue. Complications like severe viral pneumonia with multi-organ failure and death may occur.⁽³⁾ There is also concern that the virus could mutate later and

become more virulent and less susceptible to any new vaccine.

In July 2010, more than 214 countries worldwide have reported laboratory confirmed cases of pandemic (H1N1) 2009 influenza virus infection.⁽⁴⁾ In India, the first case of Novel Influenza A (H1N1) was reported on 11th May 2009 from Hyderabad.⁽⁵⁾ In India, the recent health statistics data suggested 1147 cases and 75 deaths due to H1N1 affecting Western states of India badly.⁽⁶⁾

A study by Puvanalingam A et al showed that the overall mortality rate due to swine flu was 1.8% and that 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.⁽⁷⁾ Another study by Chudasma et al in Saurashtra, Gujarat showed that the clinical course and outcomes of the 2009 pandemic (H1N1) influenza virus are comparable to those of the currently circulating seasonal influenza, with high mortality in influenza A (H1N1) patients.⁽⁸⁾

Hence, the present study was carried out to know the epidemiological features of confirmed Influenza A (H1N1) patients during such initial phase of the pandemic among all the patients screened for H1N1 at Shri Sayaji General Hospital (SSGH), Vadodara, Gujarat.

Materials and Method

A secondary data analysis of all confirmed H1N1 patients admitted at tertiary care government hospital named SSGH (Sir Sayajirao General Hospital) in Vadodara was carried out over a period of one year from August 2009 to October 2010. A total of 2440 patients were screened at SSGH during this time period. The aim of this research was to study the epidemiological profile of Influenza -A (H1N1) patients screened in SSG hospital Vadodara.

Secondary data of all patients screened for H1N1 during 01/08/2009 to 04/10/2010 at SSGH Vadodara was included in the study. The study included patients of all age groups and both gender. Being secondary data of all patients, none of these patients were excluded from the study. After getting ethical clearance, the study was carried out for 1 year, from August 2009 to October 2010.

The following information was collected from the medical records of all screened H1N1 patients like age, sex, categorization of H1N1, date of detection, treatment outcome, in case of death of patient; date when patient died. Guidelines on categorization of Seasonal Influenza cases during screening at hospitals, issued by Ministry of Health and Family Welfare, Government of India was used to categorize patients in Category A or B or C as mentioned below:⁽⁹⁾

“Patients with mild fever plus cough / sore throat with or without bodyache, headache, diarrhoea and vomiting will be categorized as Category-A. They do not require Oseltamivir and should be treated for the symptoms mentioned above. The patients should be monitored for their progress and reassessed at 24 to 48 hours by the doctor. No testing of the patient for Influenza is required. Patients should confine themselves at home and avoid mixing up with public and high risk members in the family.

In addition to all the signs and symptoms mentioned under Category-A, if the patient has high grade fever and severe sore throat, may require home isolation and Oseltamivir; (ii) In addition to all the signs and symptoms mentioned under Category-A, individuals having one or more of the following high risk conditions shall be treated with Oseltamivir: Children with mild illness but with predisposing risk factors like 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. No Tests for Influenza is required for Category-B (i) and (ii). All patients of Category-B (i) and (ii) should confine themselves at home and avoid mixing with public and high risk

members in the family. Broad Spectrum antibiotics as per the Guideline for Community acquired pneumonia (CAP) may be prescribed.

In addition to the above signs and symptoms of Category-A and B, if the patient has one or more of the following: Breathlessness, chest pain, drowsiness, fall in blood pressure, sputum mixed with blood, bluish discoloration of nails; Children with influenza like illness who had a severe disease as manifested by the red flag signs (Somnolence, high and persistent fever, inability to feed well, convulsions, shortness of breath, difficulty in breathing, etc.), worsening of underlying chronic conditions. All these patients will be in Category-C require testing, immediate hospitalization and treatment.”⁽⁹⁾

The study data was entered in Microsoft Excel worksheet. The data was analysed using Epi-Info software. Being a descriptive study, data is presented in proportions and using appropriate charts or diagrams.

During the course of the study, proper IEC (information, education communication) activities were undertaken to increase awareness amongst the patients and their families regarding the pandemic of H1N1 flu and how to tackle the disease at the grass root level. Those involved in occupational risks (farmers, animal husbandry workers, etc.) were also given special guidance.

Results

In this study, total number of patients screened was 2440. Out of 2440, 1503 were males and 937 were females. According to the guidelines on categorizing H1N1 cases, among 2440 patients screened, 1068 were kept under category A; 931 were kept under category B, and 441 were kept under category C.

Out of total patients screened, confirmed H1N1 positive patients were 245(10.0%). It was more commonly seen among age group 20 to 30 years and more among males (54%) as compared to females (46%). Among H1N1 positive females, 6 were pregnant and out of them 3 pregnant females died. Out of 245 confirmed cases, 36 patients died hence CFR (Case Fatality Rate) was found to be 14.7%. CFR among males (16.5%) was found to be higher than among females (14.5%) and CFR is highest in 50 to 60 years age group.

As shown in figure 1, out of the total patients screened for H1N1 flu, the maximum positive cases were found to be positive during winters (January and February). The study shows that there is a peak of swine flu cases during in the winter months of January and February 2009 and thereafter in August-September 2009 and it again shows a rising trend in August 2010.

Table 1: Month wise distribution of patients screened, confirmed H1N1 cases and mortality statistics

Month	Month wise no of patients screened	Month wise positivity of patients	Month wise mortality of patients
Aug 09	176	11	3
Sept 09	217	06	3
Oct 09	171	10	0
Nov 09	96	03	1
Dec 09	202	40	1
Jan 10	517	63	7
Feb 10	373	30	2
Mar 10	116	10	3
Apr 10	35	01	0
May 10	03	01	0
June 10	04	00	0
July 10	25	02	1
Aug 10	224	27	5
Sept 10	268	37	10

Table 2: Age and Sex wise distribution of Screened and Positive patients

Age group (in Years)	Total Screened	Male Screened	Female Screened	Total Positive	Positive Male	Positive Female
0-5	303	195	108	25	17	8
5-10	109	59	50	15	8	7
10-20	399	246	153	31	18	13
20-30	764	469	295	78	35	43
30-40	373	231	142	27	14	13
40-50	235	138	97	36	20	16
50-60	160	101	59	22	16	6
>60	97	64	33	11	5	6
Total	2440	1503	937	245	133	112

Table 3: Age and sex wise distribution of mortality in H1N1 positive cases (n=245)

Age group (in years)	Total Positive	Positive Male	No of deaths in Positive males(CFR)	Positive Female	No of deaths in positive females(CFR)
0-5	25	17	0(0%)	8	0(0%)
5-10	15	8	0(0%)	7	1(14.28%)
10-20	31	18	2(11.11%)	13	2(15.38%)
20-30	78	35	5(14.28%)	43	8(18.60%)
30-40	27	14	3(21.42%)	13	0(0%)
40-50	36	20	6(30%)	16	2(12.55)
50-60	22	16	6(37.5%)	6	1(16.6%)
>60	11	5	0(0%)	6	0(0%)
Total	245	133	22	112	14

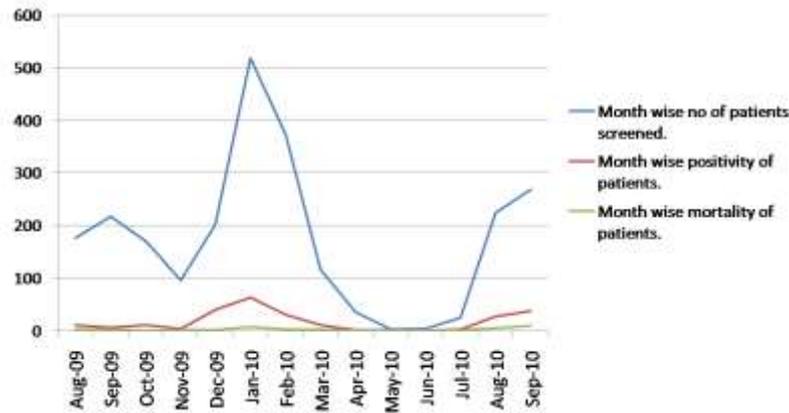


Fig. 1: Graph showing monthly distribution of H1N1 Positivity and mortality

Discussion

Swine Flu being caused by virus, it is also influenza like illness. So its epidemiology also shows similarity with other influenza like illnesses. It is more common in males as compared to females. During winter and cold weather it is very common and so we can see in figure 1, that there is typical epidemiological trend of H1N1 patients screened, found positive and mortality pattern. Peak is seen among morbidity and mortality of H1N1 patients during Jan-Feb months. And once again it is on rising level which gives us a clue that the number of cases may rise in our near future. It is seen more common in 20 to 50 years age. Although it is common in males as compared to females but in this age group it is almost equal in both sexes.

In our study, total number of patients screened was 2440. Of which H1N1 positive patients were 245 (10.0%). It was more commonly seen among age group 20 to 30 years and more among males (54%) as compared to females (46%). Among H1N1 positive females, 6 were pregnant and out of them 3 pregnant females died. According to the guidelines on categorizing H1N1 cases, in our study, among 2440 patients screened, 1068 were kept under category A; 931 were kept under category B, and 441 were kept under category C. Maximum patients were screened and found to be positive during winters (January and February). Another study conducted by V.R. Malkar et al shows that the incidence of H1N1 Influenza was high in the month of August and September when maximum (82.35% in 2009 and 76.92% in 2010) cases were detected.⁽¹⁰⁾

In this study, CFR (Case Fatality Rate) was found to be 14.7%. CFR among males (16.5%) found to be higher than among females (14.5%) and CFR was highest in 50 to 60 years age group. CFR was lower among children but it was very high in 50 to 60 years age group and it was higher among males as compared to females. Another study by Chudasma et al in Saurashtra, Gujarat showed similar findings with conclusions that the clinical course and outcomes of the 2009 pandemic (H1N1) influenza virus are comparable

to those of the currently circulating seasonal influenza, with high mortality in influenza A (H1N1) patients.⁽⁸⁾

In contrast to our study, a study by Puvanalingam A et al showed that the overall mortality rate due to swine flu was low as 1.8% and that among pregnant women with H1N1 infection was 25% and the fetal loss rate was 16.67% and there was an increased risk of H1N1 influenza infection during the third trimester of pregnancy which was statistically significant with p value of 0.027.⁽⁷⁾

Similarly, in the study conducted by V.R. Malkar et al, majority of patients presented with fever (96.67%) and cough (91.67%). No death was recorded among all confirmed patients. Majority (76.67%) of patients recovered without any complication. Among the rest, pneumonia (13.33%) was the most common complication.⁽¹⁰⁾

Thus, the H1N1 flu or swine flu is a highly communicable disease with an epidemiology similar to influenza. The disease is associated with significant morbidity and mortality, affecting almost all age groups and both sexes. Being declared as a pandemic in 2009, the disease has affected millions of people across the globe and resulted in a significant burden on economies. In spite of advances in treatment of the disease, it still poses a threat to the world.

Conclusion

The epidemiological trend of H1N1 patients screened at SSGH shows that two peaks are seen regarding case positivity, morbidity and mortality of H1N1 patients during August –September & January-February months. Moreover, once again it is showing rising trend from August 2010, which may be a clue to what to expect in winter of 2010. Among pregnant females it is difficult to comment about mortality due to H1N1 morbidity but this cross sectional study gives us a research idea of association between H1N1 status and pregnancy.

References

1. Human Swine Influenza: A pandemic threat. CDC Alert 2009; 12(8):1-9.
2. World Health Organisation: Pandemic (H1N1) 2009 - update 81. 2009
http://www.who.int/csr/don/2009_12_30/en/index.html
3. Writing Committee of the WHO Consultation on Clinical Aspects of Pandemic (H1N1) 2009 Influenza (2010). "Clinical Aspects of Pandemic 2009 Influenza A (H1N1) Virus Infection". The New England Journal of Medicine. New England Journal of Medicine. 362 (18): 1708–19
4. doi:10.1056/NEJMra1000449. PMID 20445182.
5. "WHO | Influenza updates". World Health Organization (WHO). 10 September 2010. Archived from the original on 23 May 2011. Retrieved 24 May 2011.
6. Ministry of Health and Family Welfare, Government of India, Situation update on H1N1, 11 April 2010;
7. <http://mohfwh1n1.nic.in/documents/PDF/SituationalUpdatesArchives/april2010/Situational%20Updates%20on%2011.04.2010.pdf>
8. Office of the Director, Emergency Medical Relief, Directorate General of Health Services, Government of India, New Delhi. <http://www.mohfw.nic>.
9. A Puvanalingam, C Rajendiran, K Sivasubramanian, S Ragunathanan, Sarda Suresh, S Gopalkrishnan. Case Series Study of the clinical profile of H1N1 Swine Flu Influenza. JAPI 2011;59:14-18.
10. Chudasma R, Patel U, Verma P, Amin C, Savaria D, Ninama R. Clinico-epidemiological Features of the Hospitalized patients with 2009 Pandemic Influenza A (H1N1) Virus infection in Saurashtra Region, India. Lung India 2011;28(1):11-16.
11. Ministry of Health and Family Welfare, 2009. Guidelines on categorization of influenza A H1N1 cases during screening for home isolation, testing, treatment and hospitalization.
<http://mohfwh1n1.nic.in/documents/pdf/3.Categorisation%20of%20Influenza%20A%20H1N1%20cases%20screening.pdf>.
12. Malkar VR, Joge US, Raut MM. Clinico-epidemiological profile of patients of H1N1 Influenza (Swine Flu) virus infection at a tertiary care hospital in Maharashtra. International Journal of Biological and Medical Research 2012;3(3):2116-2120.