

Research Article

Profile of confirmed H₁N₁ virus infected patients admitted in the swine flu isolation ward of tertiary care hospitals of Baroda district, Gujarat, India

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ABSTRACT

Background: Influenza is truly an international disease. It occurs in all countries and affects millions of people every year. The Influenza A H1N1 in humans can be a mild illness or in some people it may result in serious, even life-threatening complications such as pneumonia, acute bronchitis, worsening of chronic conditions, respiratory failure and death. Objective: To study profile of confirmed H1N1 virus infected patients of Category “C” admitted in the swine flu isolation ward of tertiary care hospitals of Baroda District, Gujarat, India.

Methods: This was a cross sectional observational study carried out in Baroda district of Gujarat state, India. All confirmed H1N1 virus infected 54 patients in Category “C” admitted in the swine flu isolation ward of both Government and private hospitals of Baroda district during the period of 1st January to 30th June, 2013 after taking verbal and written consent of the patients were enrolled in study. Before conducting the study approval was obtained from institutional ethical committee for human research. Data safety and confidentiality was also given due consideration. A predesigned semi-structured Performa was used. Detailed demographic and clinical data were recorded. Data was statistically analyzed using SPSS software (trial version).

Results: Out of total 54 influenza A H1N1 cases, 23 patients (42.59%) were males. 4 (12.91%) female patients were pregnant. Majority (75%) of the cases were between 21-50 years of age group. Majority (90.7%) of the patients were from urban areas. Majority cases (94.4%) presented with cough, followed by 36 cases (66.7%) exhibiting high grade fever, 35 Cases (64.8%) had complain of breathlessness and 25 cases(46.3%) presented with sore throat. 19 cases (35%) had co-morbid condition with the influenza A H1N1 disease. In this study among patients with associated Comorbid condition, 16(84%) were discharged and only 3(16%) patients died. Whereas among patients without Comorbid condition, 29(83%) were discharged and 6(17%) died. This difference was not statistically significant ($p=0.940$). 15 cases (27%) required ventilator support. Mortality of 9 cases (17%) occurred in the given duration of study and rest of cases 45(83%) were discharged from the hospital. Out of 54 cases, 4 cases had diabetes mellitus and from that 3 case were died. The difference was statistically significant ($p=0.012$).

Conclusions: Influenza A H1N1 infection predominantly affects young age and equally affecting both genders. One fourth of total cases had severe illness and required ventilator support. Majority of patients died within 8 day of critical illness. All deaths were reported from urban area. Most common symptom in fatal cases of influenza A H1N1 was cough followed by breathlessness, high grade fever, mild fever and sore throat and the most common co morbidity was Diabetes Mellitus.

Keywords: Influenza, H1N1, Profile, Swine flu, Tertiary care

INTRODUCTION

Influenza is an acute respiratory tract infection caused by influenza virus, of which there three types-A, B and C. The disease characterized by sudden onset of chills, malaise, fever, muscular pain and cough. Influenza is truly an international disease. It occurs in all countries and affects millions of people every year.¹ The most extensive and severe outbreaks are caused by influenza A viruses, because of the remarkable propensity of the H and N antigens of these viruses to undergo periodic antigenic variation. Influenza A has 16 distinct H subtypes and 9 distinct N subtypes, of which only H1, H2, H3, N1, and N2 have been associated with epidemics of disease in humans. Influenza B and C viruses are similarly designated, but H and N antigens from these viruses do not receive subtype designations, since intratypic variations in influenza B antigens are less extensive than those in influenza A viruses and may not occur with influenza C virus.²

The unique features of Influenza epidemic are the suddenness with which they arise, and the speed and ease with which they spread. The short incubation period, large number of subclinical cases, high proportion of susceptible population, short duration of immunity, and absence of cross immunity, all contribute to its rapid spread. The fate of the virus during inter-epidemic period is also not known.³

Generally Influenza A H1N1 strains do not spread easily from pigs to human and even when they do; they are not always cause disease in people. Most Influenza A H1N1 strain also does not spread easily from human to human. In contrast, H1N1 flu spreads more quickly from person to person than other forms of swine flu. The Influenza A H1N1 can spread from person to person when someone with the disease talks, coughs or sneezes.

This scatters droplets contaminated with the Influenza A H1N1 virus into the air where it can be breathed by others.⁴ People with Influenza A H1N1 typically have a fever or high temperature and may also have aching muscles, decreased thirst, decreased appetite, rapid breathing, sore throat or dry cough. These symptoms are very similar to seasonal flu.⁵

The Influenza A H1N1 in humans can be a mild illness or in some people it may result in serious, even life-threatening complications such as pneumonia, acute bronchitis, worsening of chronic conditions, respiratory failure and death. People who are increased at risk for developing serious complications of the Influenza A H1N1 included are person under long term therapy, hospitalized patients, and pregnant women.

Other people at risk included are person with an immunodeficiency disorder and chronic disease etc. The effects of the Influenza A H1N1 can vary from mild to severe life threatening depending on individual factors

such as the specific strain of the swine flu, age, general health status and presence of coexisting chronic conditions, such as cancer or diabetes.⁶ The present study describes profile of confirmed H1N1 virus infected patients of Category "C" admitted in the swine flu isolation ward of both Government and private hospitals of Baroda District, Gujarat, India.

METHODS

This was a cross sectional observational study carried out in Baroda district of Gujarat state, India. All confirmed H1N1 virus infected 54 patients in Category "C" admitted in the swine flu isolation ward of both Government and private hospitals of Baroda district during the period of 1st January to 30th June, 2013 after taking verbal and written consent of the patients were enrolled in study. Before conducting the study approval was obtained from institutional ethical committee for human research. Data safety and confidentiality was also given due consideration. The file containing identity related details was kept password protected and the filled Performa were kept in lock with key accessible only to researcher. After taking permission from the epidemic branch, department of Health and Family Welfare, Government of Gujarat, data of Influenza A H1N1 cases were collected from the Epidemic branch of Baroda. A predesigned semi-structured Performa was used to collect details such as socio-demographic details, name of hospital with detailed address, clinical data of patient (sign and symptoms, co-morbid condition), diagnostic findings of influenza testing, treatment history (use of ventilator), drug details (oseltamivir received or not), outcome details and details of current pregnancy if pregnant. Data were statistically analyzed using SPSS software (trial version).

RESULTS

Out of total 54 influenza A H1N1 cases, 23 patients (42.59%) were males & 31 patients (57.4%) were females. 4 (12.91%) female patients were pregnant. There was apparently equal affection of both male and female. Majority (75%) of the cases were between 21-50 years of age group. Majority (90.7%) of the patients were from urban areas (Table 1).

Majority cases (94.4%) presented with cough, followed by 36 cases (66.7%) exhibiting high grade fever, 35 Cases (64.8%) had complain of breathlessness and 25 cases(46.3%) presented with sore throat. Few cases had complain of chest pain (11%) and fall in BP (3.7%) (Table 2).

19 cases (35%) had co-morbid condition with the influenza A H1N1 disease (Figure1).

Table 1: Socio Demographic Characteristics of Influenza A H1N1 cases.

	Frequency	Percentage
Age Group		
0-10	3	5.55
11-20	1	1.85
21-30	16	29.62
31-40	11	20.37
41-50	13	24.07
51-60	8	14.81
>60	2	3.70
Sex		
Male	23	42.59
Female	31	57.40
Pregnancy		
Pregnant	4	12.91
Not pregnant	27	87.09
Area		
Urban	49	90.7
Rural	5	9.3

In this study around 60% of patients were admitted in private hospitals and rests were admitted in government

hospital. 15 cases (27%) required ventilator support. (Table 3).

It suggests that in almost one fourth of total influenza A H1N1 cases were found more severely ill. Mortality of 9 cases (17%) occurred in the given duration of study and rest of cases 45(83%) were discharged from the hospital. 48% patients were admitted to hospital within 4 days of onset of symptoms and 52% patients were admitted after 4 days of onset of symptoms (Table 4).

Median hospital stay of influenza A H1N1 cases was 7.5 days in this study. Majority of cases (70%) had hospital stay duration less than 10 days (Figure 2). The median age of fatal case in our study was 34 years and 75% patients were from age group of 21-50 years. In context with age of patient in this study patients having age less than 50 years were 44 out of which 6 (13%) patient died whereas 38 (87%) were discharged. Similarly among patient aged more than 50 years only 3 (30%) died and 7 (70%) discharged. This difference in the outcome and age group was not statistically significant ($p=0.433$). In this study Influenza A H1N1 disease affects both genders equally. Also outcome was not affected by gender. There was no statistical significant difference in Male and Female ($p=0.242$).

Table 2: Clinical profile of influenza A H1N1 Case.

Sign & Symptoms	Male		Female		Total	
	(N=23)	%	(N=31)	%	(N=54)	%
Cough	22	95.7	29	93.5	51	94.4
High Grade Fever	13	56.5	23	74.2	36	66.7
Breathlessness	14	60.9	21	67.7	35	64.8
Mild Fever	12	52.2	13	41.9	25	46.3
Sore Throat	13	56.5	12	38.7	25	46.3
Headache & Body ache	5	21.7	8	25.81	13	24.1
Runny Nose	6	26.1	7	22.6	13	24.1
Vomiting	1	4.3	5	16.1	6	11.1
Diarrhoea	1	4.3	3	9.7	4	7.4
Chest Pain	1	4.3	5	16.1	6	11.1
Fall in BP	2	8.7	0	0	2	3.7

Table 3: Type of healthcare facility, ventilator used and outcome of influenza A H1N1 cases.

Variable	Frequency	Percentage
Type of Healthcare Facility		
Government	32	59.3
Private	22	40.7
Ventilator Used		
Used	15	27.8
Not Used	39	72.2
Outcome		
Death	9	83.3
Discharged	45	16.7

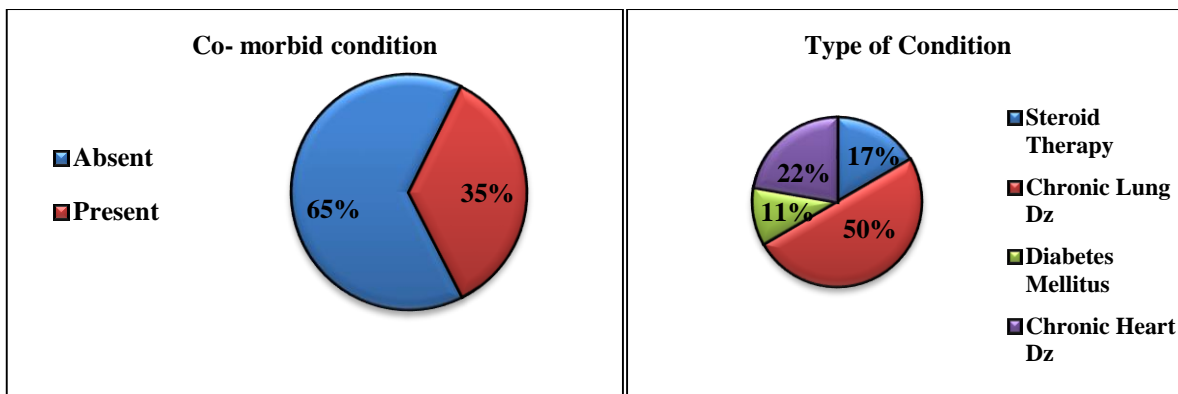


Figure 1: Comorbid condition of influenza A H1N1 case.

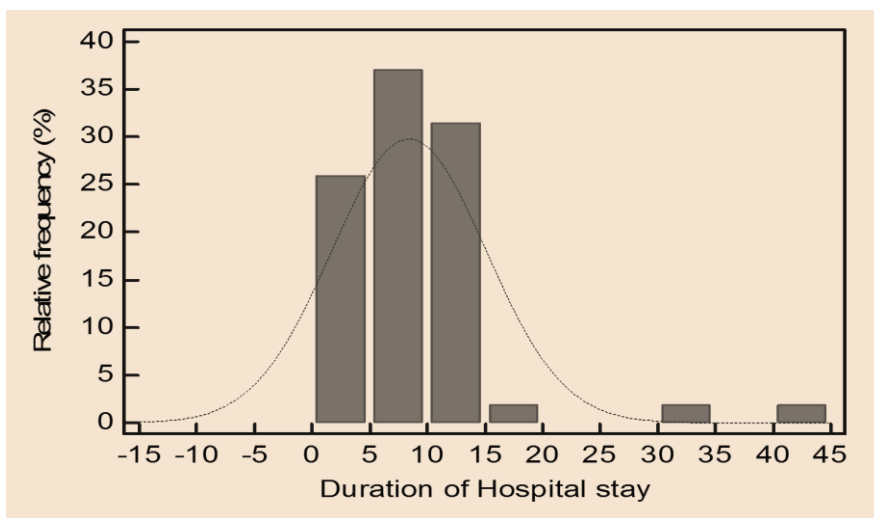


Figure 2: Duration of hospital stay (in days).

Also in this study out of total cases majority of cases (90%) were from the urban areas and only few (10%) from the rural area. Hence it is seen that all the fatal cases belong to urban and so outcome is not significantly affected by the residence of patient (Table 5). In this study among patients with associated Comorbid condition, 16 (84%) were discharged and only 3 (16%) patients died. Whereas among patients without Comorbid condition, 29 (83%) were discharged and 6 (17%) died.

Table 4: Gap between date of onset of symptoms and hospital admission (in days).

Influenza A H1N1 cases	Percentage
≤1	9.2
2 to 4	38.8
5 to 10	44.4
>10	7.4

This difference was not statistically significant (p=0.940). In Government hospitals, out of 22 patients, 18 (82%)

patients were discharged and 5 (16%) patients were died. In private hospital, out of 32 patients, 27 (84%) patients were discharged and 4 (18%) died. There was no significant difference seen in type of health care facility and outcome of patient (p=0.901). In patient with gap less than or equal to 5 days mortality occurred in 7 (18%) patients. In patients with gap more than 5 days mortality occurred in 2 (11%) patients. Gap between date of onset of symptoms and date of hospital admission had not any significant effect on outcome of patient (p=0.324). Patient with less than or equal to 10 days hospital stay, mortality occurred in 7 (18%) patients and patients with more than 10 days of hospital stay, mortality occurred in 2 (11%) patients. But this difference was not statistically significant (p=0.793). Ventilator support was required in 15 patients out of which 9 (60%) patients were died only 6 (40%) were discharged. (Table 6) Time interval between onset of symptoms and death was ≤10 days in majority (77%) of patients. Out of 54 cases, 4 cases had diabetes mellitus and from that 3 case were died. The difference was statistically significant (p=0.012).

Table 5: Demographic factors affecting outcome.

Variable	Outcome			X ² Value (P value)	
	Group	Discharged	Death		Total
Median Age (Years)		36.5	34	36.5	
Age	≤50	38(87%)	6(13%)	44	0.614(0.433)
	>50	7(70%)	3(30%)	10	
SEX	Male	18(78%)	5(22%)	23	0.622(0.242)
	Female	27(87%)	4(13%)	31	
Area	Urban	40(81%)	9(19%)	49	(0.575)
	Rural	5(100%)	0(0)	5	

Table 6: Clinical profile affecting outcome.

	Group	Discharged	Death	Total	X ² value (P value)
Associated Comorbid Condition	Present	16(84%)	3(16%)	19	0.012 (0.940)
	Absent	29(83%)	6(17%)	35	
Type Of hospital	Private	27(84%)	5(16%)	32	0.015 (0.901)
	Govt.	18(82%)	4(18%)	22	
Gap between date of onset of symptoms and hospital admission in days	≤5	24(78%)	7(12%)	31	0.969 (0.272)
	>5	21(92%)	2(8%)	23	
Hospital Stays In days	≤10	30(82%)	7(18%)	37	0.068 (0.702)
	>10	15(89%)	2(11%)	17	
Ventilatory Support	Used	6(40%)	9(60%)	15	
	Not Used	39(100%)	0(0%)	39	

DISCUSSION

Majority (75%) of the cases were between 21-50 years of age group. Similar study conducted by Himanshu R et al, in Gujarat during found 64.9% cases were seen amongst the young age group of 13 to 45years.⁷ Another study conducted in Delhi in 2009 at time of emergence of pandemic influenza A H1N1 maximum number of positive cases (35.1%) were from 20-39 years age group.⁸ In Manipal by Jagannatha Rao SR et al., conclude that the age group of positive case of H1N1 was between 21 and 30 years.⁹

In our study there was apparently equal affection of both male and female. The difference between the number of male and female was statistically not significant in our study. Similarly, Rajesh et al., in Saurashtra also found that half of the patients (56.3%) were females.¹⁰ Contradictory to this a study done by Ketan Patel et al also observed 65% males and 35% females among H1N1 cases.¹¹ In our study 49 patients (90.7%) were residing in urban area. Similar results were found in Saurashtra study carried out by Rajesh K Chudasama et al.¹⁰ Influenza A H1N1 cases were reported more from the urban area than rural area, which may be due to the dense population in urban area favoring spread of virus infection. Attack rates are also high in close population group.

In our study most common symptoms was Cough and High Grade fever which was similar to various studies.^{2,10,12} Headache- Body ache were 24.1% in our study which was more or less similar to Saurashtra study (21.5%) and California study (33%). Presence of breathlessness was slightly more in our study (66%) as compared to studies conducted by Rajesh et al and Bhavin et al.^{2,10} Gastro Intestinal symptoms like vomiting (11.1) and diarrhea (7.4%) were less common as compared to study done in Surat.² In our study, breathlessness was present in almost all fatal cases which was similar to study conducted by Bhavin et al.²

In our study 19 cases (35%) had co-morbid condition with the influenza A H1N1 disease. Almost similar result was observed in study carried out by H Rana et al.,⁷ (31%). Compared to our study, in study conducted by Ketan K Patel et al.,¹¹ associated co morbid condition was present in 20.6% of patients. Among 19 cases with co-morbid conditions, half of the cases had Chronic Lung Disease and in rest of cases had co-morbid conditions like Diabetes mellitus (11%) and Chronic Heart disease (22%) while few Cases (17%) were on the steroid therapy. Similar result found in study carried out by Kumar A et al. in Canada, most common individual co morbidities were chronic lung disease (41.1%).¹³ In Saurashtra study also similar coexisting conditions like diabetes mellitus, hypertension, chronic pulmonary diseases were observed among H1N1 cases.¹⁰ In contrast

to our study Gupta B D et al., observed Comorbid illness like consolidation in 25 (40%) cases and other respiratory conditions like pleural effusion (6%), pneumothorax (3%) and pulmonary edema (1%) in Rajasthan.¹⁴

In our study mortality of 9 cases (17%) occurred in the given duration of study and rest of cases 45 (83%) were discharged from the hospital. Case fatality rate between 20 to 25 % was observed in other studies carried out in Ahmedabad, Maharashtra, and Surat.^{2,10,12} In our study, among patients with associated Comorbid condition, 16 (84%) were discharged and only 3 (16%) patients died. Whereas among patients without Comorbid condition, 29 (83%) were discharged and 6 (17%) died. This difference was not statistically significant ($p=0.940$). This may be attributed to non-diagnosis of co-morbid conditions at the time of hospital admission or proper history not taken by the attending medical personnel.

In our study 48% patients were admitted to hospital within 4 days of onset of symptoms and 52% patients were admitted after 4 days of onset of symptoms. Almost analogous result was found in Studies conducted in Surat and Saurashtra.^{2,10} A median times of 5 days was reported from the onset of illness to hospital admission of influenza A (H1N1) among patients. A study by Rajesh et al also found a median time of five days from onset of illness to influenza A (H1N1) diagnosis.¹⁰ The time duration between onset of illness and hospital admission and diagnosis was more than that reported from other countries.^{15,16} The possible justification is that patients seek treatment at a local level from general practitioners and physicians, but with no or little improvement after initial treatment, they were referred to a higher center for further investigation and management. In such cases there is a need to take detailed treatment history.

In our study median hospital stay of influenza A H1N1 cases was 7.5 days in this study. Majority of cases (70%) had hospital stay duration less than 10 days. A study conducted in Maharashtra, mean duration of hospital stay was 4 days (range 2-13 days).¹² Studies carried out in Saurashtra and Surat, a median time of six days and 5.3 days was reported for hospital stay respectively.^{2,10} This difference in the hospital stay may be because in other study we have included patients from both private and government hospitals whereas other studies mention about only tertiary level government hospital.

CONCLUSION

Influenza A H1N1 infection predominantly affects young age and equally affecting both genders. One fourth of total cases had severe illness and required ventilator support. Majority of patients died within 8 day of critical illness. All deaths were reported from urban area. Most common symptom in fatal cases of influenza A H1N1 was cough followed by breathlessness, high grade fever, mild fever and sore throat and the most common co morbidity was Diabetes Mellitus.

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