

## CLINICO-EPIDEMIOLOGICAL PROFILE OF INFLUENZA A H1N1 CASES ADMITTED AT A TERTIARY CARE INSTITUTE OF WESTERN INDIA

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DOI: 10.5455/ijmsph.2014.140720141

Received Date: 24.06.2014

Accepted Date: 14.07.2014

### ABSTRACT

**Background:** H1N1 is a novel strain of Influenza A virus that evolved by genetic reassortment. Following its emergence in March 2009 in Mexico, H1N1 virus spread rapidly throughout the world. India confirmed its first case on 16 May 2009 when someone tested positive for the H1N1 in Hyderabad.

**Aims & Objectives:** (1) To study the epidemiology of Influenza A H1N1 cases; (2) To study clinical presentation of Influenza A H1N1 cases.

**Materials and Methods:** Clinical epidemiological characteristics of Influenza A H1N1 cases admitted at IDW (Infectious Disease Ward) at Government Medical College and Hospital (GMCH), Solapur. Cases from August 2009 to December 2009 were descriptively analysed. Data were analysed using MS Excel software.

**Results:** At GMCH, till December 2009, a total 4229 patients were screened for Influenza A H1N1, of which 110 were admitted and tested. Maximum cases were detected in the month of October and the patients of age group >15-30 years accounted for 30% (33 cases) of the cases. Influenza A H1N1 resulted in death of 17.2% of the admitted cases, of which 47% deaths occurred within 48 h of admission. Common symptoms were fever and cough.

**Conclusion:** On the basis of these findings, it can be safely hypothesized that prevalence of Influenza A H1N1 is high in the younger population, and fever, cough and sore throat are the most common symptoms with which the patients usually present.

**Key Words:** Epidemiology; Influenza A H1N1; Clinical Profile; Solapur

### Introduction

H1N1 is a novel strain of Influenza A virus that evolved by genetic reassortment. Following its emergence in March 2009 in Mexico, H1N1 virus spread rapidly throughout the world.<sup>[1]</sup> WHO declared H1N1 as a pandemic on 11<sup>th</sup> June, 2009.<sup>[1]</sup> The effect that Influenza can have on public health infrastructure, were demonstrated globally during the 2009-2010 pandemic.<sup>[2]</sup> India confirmed its first case on 16 May 2009, when someone tested positive for the H1N1 Influenza A virus in Hyderabad, and first mortality due to Influenza A H1N1 was reported on 6 July 2009 from Pune.<sup>[3]</sup> First Influenza A H1N1 case from Solapur, Maharashtra, was noticed on 8 August 2009.

As there are very limited studies related to Influenza A H1N1, and its clinical and epidemiology in the Indian situation, this study was one attempt To study epidemiology of Influenza A H1N1 cases and to study clinical presentation of Influenza A H1N1 cases.

### Materials and Methods

From August 2009 to December 2009, 4229 patients were screened, and Out of these, 110 cases suspected to be infected with the novel strain of Influenza A (H1N1),

were admitted In Infectious Disease Ward (IDW) at tertiary care government hospital in Solapur. For confirmation of positivity among admitted cases, nasopharyngeal and throat swab were tested by RT-PCR at the National Institute of Virology, Pune. These suspected cases were taken as study population. A screening center and Infectious disease ward with critical care facility for Influenza A H1N1 patients was created to provide necessary medical care. Patients were admitted in the Infectious disease ward from screening center, outpatients department and emergency department (medicine and paediatrics).

The Tertiary Care Government Hospital, Solapur, Maharashtra, is a 750-bedded teaching institute. Screening, testing and treatment of H1N1 patients were done according to the guidelines of the Ministry of Health and Family Welfare, New Delhi.

This study was a hospital based descriptive study. Data were collected from a questionnaire that was used to record patient information and presentation. Epidemiological characteristics were analyzed in terms of demographic characteristics, clinical presentation and outcome. Data were analyzed using Microsoft Excel Software and basic statistical measures like mean, median, percentage, etc. were calculated.

## Results

From August 2009 to December 2009, 4229 patients were screened, and 110 patients were admitted in Infectious disease ward, and tested for Influenza A H1N1, of which 24.5% (27) were found to be H1N1 positive. The case fatality ratio was found to be 63%. Government Medical College and Hospital (GMCH) received patients from Solapur, Osmanabad, Vijapur and Gulberga district of the western India.

As figure 1 explains, the number of Influenza A H1N1 cases gradually escalated from the month of August, reaching a peak in the October month. The GMCH had reported maximum cases and mortality in the month of October, i.e., 45.4% and 42% (of total cases and mortality reported during the entire study period), respectively.

### Characteristics of Influenza A H1N1 Cases

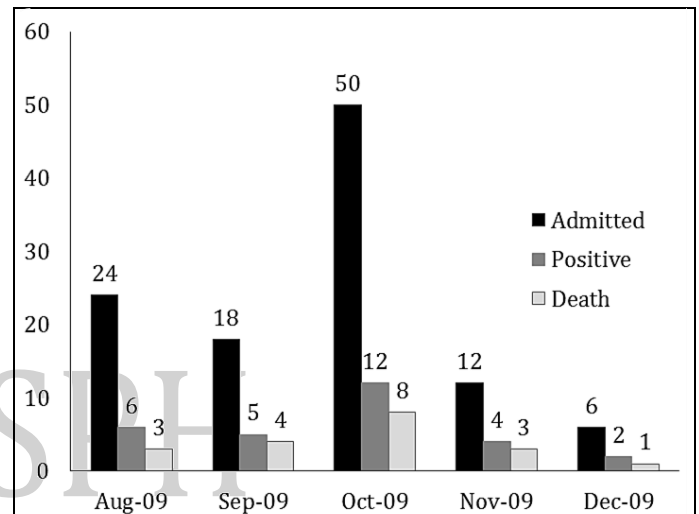
Of the 4229 patients screened at the Influenza A H1N1 screening clinic at GMCH, 2.6% (110 cases) admitted and tested and 24.5% (27 cases) patients were found positive. Patient's age varied from 5 months to 80 years, with an average age of 26.27 years (median age of 24 years). As Table 1 explains, out of the total cases, 61% (67 cases) were male and 39% (43 cases) were female. Influenza A H1N1 primarily affected the younger population, with patients >15-45 years age group accounting for 51.8% (57 cases) of the total cases [Table 1]. Maximum positivity of Influenza A H1N1 was found in the age group >15-30 years, both in male and female. The age group > 60 years comprised only 4.5% (5 cases) of the total cases. Population at the extremes of age (0-5 and >60 years) formed 21% of total admitted cases [Table 1]. From Table 1, it can be hypothesized that Influenza A H1N1 has caused huge morbidity among the younger population, i.e., in the age group of >15-30 years, and the older population got relatively spared.

A total of 19 deaths occurred in the Influenza A H1N1 disease ward, of which 17 (89.4%) deaths were observed in the Influenza A H1N1 positive cases. Majority of the patient who died, required intensive care and ventilator support. Of the total 19 deaths, 47% (9) occurred within 48 hrs of admission, of which 5 were within 24 hrs of admission. A single death was reported in a 20-year-old antenatal case with 27 weeks of gestation. More deaths occurred in females compared to males. It can be seen from Table 1 that 74% deaths occurred in the age group >15-45 years, out of which, majority deaths occurred in the age group of >15-30 years. Maximum case fatality

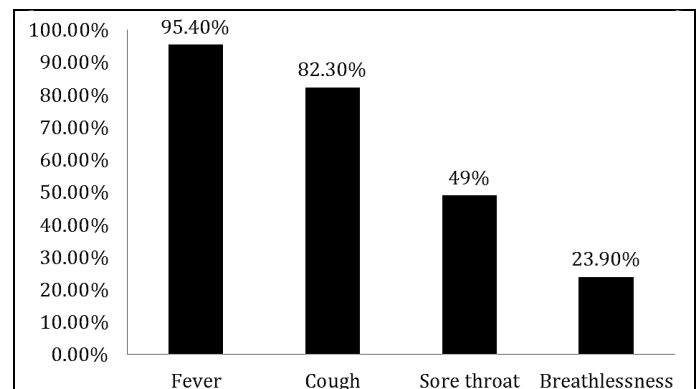
ratio was observed in the age group > 30-45 years i.e. 50% and 100% in male and female respectively.

**Table-1: Morbidity and mortality due to Influenza A H1N1 at GMCH, Solapur**

Age Group (years)	Male				Female									
	Admitted		Positive		Deaths		CFR	Admitted		Positive		Deaths		CFR
	N	%	N	%	N	%		N	%	N	%	N	%	
0-5	14	20.8	00	00	00	00	00	04	9.3	00	00	00	00	00
>5-15	12	17.9	02	13.3	01	16.6	50.0	05	11.6	03	25	02	15.3	66.6
>15-30	18	26.8	06	40.0	02	33.3	33.3	15	34.8	05	41.6	07*	53.8	100
>30-45	11	16.4	04	26.6	02	33.3	50.0	13	30.2	03	25	03	23.0	100
>45-60	08	11.9	02	13.3	01	16.6	50.0	05	11.6	01	8.3	01	7.6	100
>60	04	6.0	01	6.7	00	00	00	01	2.3	00	00	00	00	00



**Figure-1: Trend of Influenza A H1N1 cases in GMCH**



**Figure-2: Clinical symptoms of Influenza A H1N1 cases**

### Clinical Presentation and Outcome of Influenza A H1N1 Cases

Most common symptom associated with Influenza A H1N1 was found to be fever, followed by cough, sore throat and breathlessness as shown in the figure 2. Initially, the patients were isolated in the Influenza A H1N1 isolation ward. To prevent spread of infection of Influenza A H1N1, they were admitted till they completed their complete Tamiflu therapy, and were

discharged as soon as they got cured. Relatives of cases were administered prophylaxis for Influenza A H1N1.

## Discussion

All the cases from August 2009 to December 2009 reporting to the Influenza A H1N1 screening center, outpatient department, and emergency department, were included in this study. GMCH had cases from Solapur, Osmanabad, Vijapur and Gulberga, etc., which may reflect the trend, morbidity and mortality of Influenza A H1N1 in this part of India.

As of December 2009, in India, 27236 persons had been found to be positive for Influenza A H1N1, with a case fatality ratio of 3.6%<sup>[4]</sup> while positivity rate in this study is 24.5% (29), with a case fatality ratio of 63%. High prevalence and mortality may be attributed to the study population restricted to a small geographical area compared to the entire country, and especially sick female patients referred from adjacent districts having delay in essential medical care required, with loss of crucial time.

Age of patient varied from 5 months to 80 years, with an average age of 26.27 years (median age-24 years). Of the total 30% cases, 47.3% total mortality was observed in patients >15- 30 years of age, which clearly reflects its high prevalence, morbidity and mortality among the younger population. According to study, the prevalence of Influenza A H1N1 in 2009 was greatest among children and adults, although older patients and those with co-morbidities are more likely to experience worse clinical outcome.<sup>[5]</sup>

Similarly, a study done in Chennai at two government hospital concluded that, in 2010, Influenza A H1N1 predominantly affected young patients with relatively sparing of the elderly population.<sup>[6]</sup> According to a study done in Queensland, a large number of cases were reported in the 10-19 years age group (28%), followed by the 20-29 years age group (26%).<sup>[7]</sup> Likewise, study done in Pune, commonly affected age group was 21-30 years followed by 11-20 years and elderly population was spared.<sup>[8]</sup>

The most common symptoms, with which patients presented, were fever (95.4%), cough (82.32%), sore throat (49%) and breathlessness (23.9%). In a study done in Delhi, fever (100%), cough (87.5%), sore throat (43.7%) and breathlessness (87.5%) were found to be the most common symptoms in Influenza A H1N1.<sup>[9]</sup>

Fever (56%) was also reported to be most common symptom, followed by cough (54%), sore throat (32%), rhinitis (17%) and difficulty in breathing (7%) in a study of the first 100 cases of Influenza A H1N1 in Saudi Arabia.<sup>[10]</sup>

Although patients in this study comprised a sizeable proportion of cases from Solapur and adjoining districts, the finding of this study need to be carefully extrapolated, and cannot be generalized to a large population. This is one of the limitations of our study. Secondly, we restricted our study to only hospital; therefore, many cases of Influenza A H1N1 may have been missed. Not being community-based study, we may not be able to calculate the exact measure of epidemiology. Thirdly, regional geographical conditions have not been accounted for, which may have a significant impact on prevalence and morbidity. There may be a small number of cases that may have been missed out, although every attempt was taken to include all the cases, but this figure would not have been significant.

## Conclusion

On the basis of the findings of this study, it was hypothesized that the maximum number of Influenza A H1N1 cases is expected in the age group >15-30 years (younger population), and fever & cough are the most common symptoms, with which the patients usually present. Most of the mortality is expected in females of age group >15-30 years. This study provides hospital-based epidemiological information, but community-based wider studies are required to arrive at a more precise and accurate understanding of Influenza A H1N1.

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**Cite this article as:** Gaikwad LL, Haralkar S. Clinico-epidemiological profile of Influenza A H1N1 cases admitted at a tertiary care institute of Western India. Int J Med Sci Public Health 2014;3:1258-1261.

**Source of Support:** Nil

**Conflict of interest:** None declared

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