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# Epidemiological Profile of H1N1 Cases in Western Rajasthan from January 2012 to December 2012.


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## ABSTRACT

*Context: A large number of H1N1cases and deaths have been reported in Western Rajasthan during pandemic of H1N1 in year 2009-10. In year 2012 this Influenza A H1N1 virus once again resurfacing in western Rajasthan and reared its ugly head in the western Rajasthan.Once again H1N1 infection posed a serious threat to health community and was a cause of serious concerns in Western Rajasthan. Aims: To study the epidemiological profile of H1N1 cases in Western Rajasthan from January 2012 to December 2012. Settings and Design: Retrospective descriptive analysis Methods and Material: Epidemiological characteristics of Influenza A H1N1 cases in Western Rajasthan from January 2012 to December 2012 were retrospectively, descriptively analyzed using data from the swine flu control room, Influenza A H1N1 screening center and isolation wards at the Dr.S.N. Medical College, Jodhpur. Dr.S.N. Medical College, Jodhpur is a largest multispecialty tertiary care teaching institution in Western Rajasthan. Data were Analyzed using MS Excel software. Results: At Dr. SNMC, from January 2012 to December 2012, a total of 817patients were tested for Influenza A H1N1, of which 21.8% (178) were found to be positive for the disease. Majority (71.3%, 127) of cases were females. Maximum cases (50%) were detected in the month of December and the patients >15-45 years of age accounted for 75.8% (135 ) of the cases. Influenza A H1N1 resulted in death of 12.9% (23) of the total cases, of which 65% (15) deaths occurred within 48 h of admission. Majority (69.6%,16) of deaths occurred in females. The patients >15-45 years of age accounted for 52.2% of the deaths. 40.4% (72) of cases and 52.2% (12) of deaths have occurred in pregnant and postpartum women. Conclusions: Influenza A H1N1 virus once again resurfacing in western Rajasthan and reared its ugly head in the western Rajasthan in year 2012. Similar to H1N1 pandemic 2009, the incidence and mortality in 2012 in western Rajasthan was higher in young. H1N1 influenza can cause severe illness and deaths in pregnant and postpartum women.*


**KEYWORDS: H1N1, Swine Flu, Western Rajasthan, Pandemic**

## 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.(1) WHO declared H1N1 as a pandemic on 11th June, 2009.[1]This was the first of its kind declaration by WHO in the past 70 years.[1]

The disease started in India in the month of May 2009 and the first laboratory-confirmed case was reported from Hyderabad on 16May.[2] Soon the disease spread to other parts of the country. During pandemic large number of cases and deaths occurred in India.WHO Declared H1N1 Post- Pandemic on 10 August 2010.The pandemic influenza A H1N1 virus is now circulating as seasonal influenza A H1N1 virus.

The state of Rajasthan which is the largest state in India reported its first case of H1N1 on 23 July 2009.[3] Soon the disease spread to other parts of the state. A large number of H1N1cases (584 cases) and deaths (80 deaths) have been reported in western Rajasthan during pandemic of H1N1 in year 2009-10. After that in year 2011Western Rajasthan reported little influenza activity (13 cases). In the year 2012 sporadic outbreaks of Influenza A H1N1 were reported from across the India. This Influenza A H1N1 virus once again resurfacing in western Rajasthan and reared its ugly head in the western Rajasthan. This study is aimed to give an idea regarding the epidemiological trends of the H1N1dieases in western Rajasthan in year 2012.

## METHODS AND MATERIAL:

The Dr.S.N. Medical College, Jodhpur is a largest multispecialty tertiary care teaching institution in Western Rajasthan with capacity of approximately 2000 beds. Four Government hospitals attached to this Medical College. There is a screening centre and isolation ward with critical care facility for Influenza A H1N1 patients in all these four hospitals to provide necessary medical care. There is a swine flu control room at Dr.SNMC for monitoring of Influenza A H1N1. Function of swine flu control room is collect information about all suspected and confirmed cases of H1N1 and keep complete data of all the patients visiting these screening centres and swine Flu wards.

In order to study the epidemiology and establish the magnitude and severity of Influenza A H1N1 in Western Rajasthan in year 2012, a retrospective, descriptive study was carried out at the Dr.S.N. Medical College, Jodhpur.Data of swine flu cases from January 2012 to December 2012 were taken from the Swine flu control room.

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:

A retrospective, descriptive study was carried out at the Dr. SNMC, Jodhpur to study the epidemiological profile of H1N1 cases in Western Rajasthan from January 2012 to December 2012.

In year 2012, from January to December, 817 suspected patients were tested, of which 21.8 % (178) were found to be H1N1positive.A total of 117 confirmed cases were admitted in the Influenza A H1N1 isolation wards, of which 12.9% (23 cases) succumbed to the disease [Table 1]. The case fatality ratio was found to be 12.9%.

Table 1: District wise distribution of Influenza A H1N1 cases and deaths from the month of January 2012 to December 2012 in Western Rajasthan

| District | Confirmed Cases | Deaths |
|---|---|---|
| Jodhpur | 131 | 11 |
| Pali | 9 | 1 |
| Barmer | 14 | 7 |
| Jaisalmer | 5 | 3 |

| | | |
|---|---|---|
| Nagour | 20 | 1 |
| Jalore | 1 | 0 |
| Total | 178 | 23 |

Dr. SNMC received patients from Jodhpur, Barmer, Jaisalmer, Pali, Nagour and Jalore district of the Western Rajasthan [Table 1]. The Maximum numbers of cases (73.6%, 131) were seen in Jodhpur district [Table 1].

From [Figure 1], it can be seen that the number of Influenza A H1N1 cases gradually escalated from the month of September reaching a peak in the winter months. The western Rajasthan had reported maximum cases and mortality in the month of December, i.e., 50% and 47.8% of total cases and mortality reported during the month of December respectively [Figure 1].

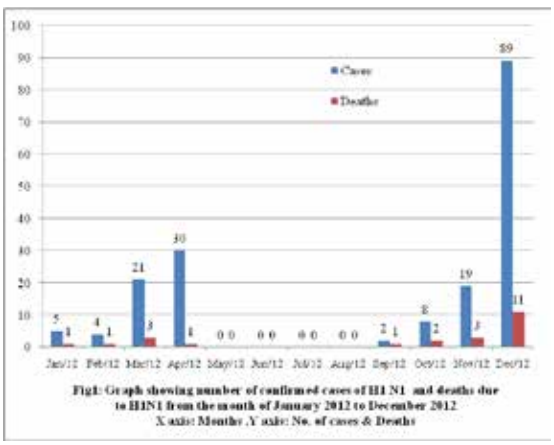


Fig1: Graph showing number of confirmed cases of H1 N1 and deaths due to H1N1 from the month of January 2012 to December 2012
X axis: Months Y axis: No. of cases & Deaths

Characteristics of influenza A H1N1 cases

In year 2012, from January to December, 817 patients were tested for H1 N1 at Dr.SNMC, of which 21.8 % (178) were found to be positive.

Patient's age varied from 20 days to 87 years, with an average age of 28.9 years (median age of 26 years).From Table 2, it can be seen that of the total cases, 71.3% (127 cases) were female and 28.3%(51cases) were male. Influenza A H1N1 primarily affected the younger population, with patients >15-45 years age group accounting for 75.8% (135 cases) of the total cases [Table 2].

Table 2: Morbidity and mortality due to Influenza A H1N1 from the month of January 2012 to December 2012 in Western Rajasthan

| Age group (Years) | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Positive | | Deaths | | Case fatality ratio | Positive | | Deaths | | Case fatality ratio |
| | No | % | No. | % | | No | % | No | % | |
| 0-15 | 13 | 25.5 | 0 | 00 | 00 | 6 | 4.7 | 1 | 6.25 | 16.7 |
| >15-30 | 10 | 19.6 | 0 | 00 | 00 | 92 | 72.4 | 12 | 75.0 | 13.0 |
| >30-45 | 11 | 21.6 | 3 | 42.8 | 27.2 | 22 | 17.3 | 2 | 12.5 | 9.1 |
| >45-60 | 8 | 15.7 | 2 | 28.6 | 25.0 | 4 | 3.2 | 1 | 6.25 | 25.0 |
| >60 | 9 | 17.6 | 2 | 28.6 | 22.2 | 3 | 2.4 | 0 | 00 | 00 |
| Total | 51 | 100 | 7 | 100 | 13.7 | 127 | 100 | 16 | 100 | 12.6 |

The age group of >15-30 years accounted for 57.3% (102 cases) and >30-45 years age group comprised 18.6% (33 cases) of the total cases [Table 2]. 72.4% of the total positive patients in females were of the age group >15-30 years.

The age group of 0-15 years comprised only 10.7% (19 cases) of the total cases, of which 13 cases occurred in children less than 5 year of age. Population at the extremes of age (0-15 and >60 years) formed 17.4% (10.7% and 6.6%, respectively) of the total positive patients [Table 2].

From Table 2, it can be hypothesised 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.

Out of total 178 Influenza A H1N1 cases 23 had expired with an overall case fatality rate of 12.9%. Majority of the patient who died required intensive care and ventilator support. There were 13 deaths in Jodhpur district , whereas Barmer ,Pali,Jaisalmer and Nagour had 4,2,2 and 2 deaths respectively [Table 1]. 69.6% (16) deaths occurred in females and the rest occurred in males.

It can be seen from Table 2 that 78% deaths occurred in the age group >15-45 years, with 52.2% (16) deaths in the age group of >15-30years and 26.1% (6) deaths in the age group >30 to 45 years. Only 3 deaths had occurred in population at the extremes of age (0-15 and >60 years) [Table 2]. Of the total 23 deaths, 65% (15) occurred within 1 to 3 days of admission.

Pregnancy and influenza A H1N1 Infection

40.4% (72 out of 178) of total H1N1 cases and 56.7 % of total female cases (72 out of 127) have occurred in pregnant and postpartum women [Table 3].52.2% (12 out of 23) of total deaths and 75% of female deaths (12 out of 16) caused by H1N1 influenza A virus have occurred in pregnant and postpartum women [Table 3]. Of the 72 H1N1 positive pregnant and postpartum women 55 were pregnant and 17 were postpartum. Out of 72 pregnant patients, 62 (45 who were pregnant and 17 who were postpartum) requiring hospitalisation. Of the 55 pregnant patients, 5 (9.1%) were in the first trimester, 16 (29.1%) were in the second trimester, and 34 (61.8%) were in the third trimester.

Table 3: Pregnancy and H1N1 Infection

| | Cases | Deaths | Case fatality ratio (%) |
|---|---|---|---|
| Pregnant | 72 | 12 | 16.6 |
| Non-Pregnant | 55 | 04 | 7.3 |
| Total | 127 | 16 | 12.6 |

## DISCUSSION

All the cases from January 2012 to December 2012 reporting to the Influenza A H1N1 screening center, outpatient department and emergency department of Dr. SNMC were included in this study. Dr.SNMC had cases from Jodhpur, Barmer, Jaisalmer, Pali, Nagour and Jalore districts of the Western Rajasthan, which may reflect the trend, morbidity and mortality of Influenza A H1N1 in this part of India. Majority (73.5%, 131out of 178) of cases reported from Jodhpur district.

Total 4,568 cases of swine flu were registered in the India in year 2012 with a case fatality rate of 7.5% (344 deaths).[4]

A Puvanalingam et al (2010) in their Study in two government hospitals in Chennai observed case fatality rate of H1N1was only1.8%.[5] Tanvir Samra et al (2010) in their Study in tertiary care hospital in Northern India reported case fatality rate of H1N1was 5 %.[6] While the positivity rate in present study is 21.8%, with a case fatality ratio of 12.9%. High prevalence and mortality may be attributed to the study population restricted to a small geographical area when compared against the entire country and sick patients referred from adjacent desert parts having delay in essential medical care required, with loss of crucial time.

In present study it was observed that majority (71.3%) of cases were female and only 28.3% cases were male. In contrast, A Puvanalingam et al (2010) in their Study observed that more cases occurred in male (54%) as compare to female (46%).[5] Majority (69.6%) of deaths caused by H1N1 influenza A virus have occurred in female.This is similar to that reported in other studies [5, 7].This indicating not only a late referral but also the severity of disease being more in women, especially, pregnant women.

Age of patient varied from 20 days to 87 years, with an average age of 28.9 years (median age-26.0 years). Of the total 75.8% cases, 78% of total mortality was observed in patients with >15-45 years of age, which clearly reflects its high prevalence, morbidity and mortality among the younger population. This is similar to that reported in other studies. [5,8,9,10,11] In contrast, Himanshu Rana et al (2010) in their Study observed a very high H1N1 mortality in those above 45 years of age (case fatality of 26.8%).[7]

The suspected as well as confirmed cases rose during the winter months of October, November and December. As H1N1 is a viral disease that spreads via aerosols, the disease was expected to rise in winter months. With the fall in temperature during the winter months the spread of the disease via aerosols like any other influenza strain and like other respiratory viruses increased steeply so that 50% of all positive were seen in the month of December itself.

In our study, approximately 40.4% (72 out of 178) of cases and 52.2% (12 out of 23) of deaths caused by H1N1 influenza A virus have occurred in pregnant and postpartum women. During prior influenza epidemics and pandemics, as well as during the pandemic (2009), pregnant women have had increased morbidity and mortality. [12] Similarly in our study mortality rate in H1N1 influenza in pregnancy was found to be 16.7% (12 out of 72).During previous influenza pandemics, increased rates of spontaneous abortion and preterm birth have been reported among pregnant women, especially in those with pneumonia. [13] H1N1 influenza infection was more common in the third trimester of pregnancy (61.8%). Similar to our analysis, A Puvanalingam et al (2010) in their Study in two government hospitals in Chennai also observed the high case fatality (25%,3 out of the 12 cases) among pregnant women.[5] Although patients in this study comprised a sizeable proportion of cases from Jodhpur and the adjoining districts of the Western Rajasthan , the findings 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 a community-based study, we may not be able to calculate the exact measures 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

The incidence and mortality from H1N1 in Western Rajasthan in 2012 was significantly higher in young, more during the winter months. Jodhpur and Barmer were the most affected districts in the Western Rajasthan. H1N1 influenza can cause severe illness and death in pregnant and postpartum women; regardless of the results of testing, prompt evaluation and antiviral treatment of influenza-like illness should be considered in such women.

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