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Epidemiological profile of Influenza A H1N1 cases in Western Rajasthan from January 2013 to March 2013

KEYWORDS: H1N1, Swine Flu, Western Rajasthan, Pandemic

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ABSTRACT *Aims: To study the epidemiological profile of Influenza A H1N1 cases in Western Rajasthan in year 2013.*

Methods and Material: Epidemiological characteristics of Influenza A H1N1 cases in Western Rajasthan from 1st January 2013 to 31st March 2013 were retrospectively, descriptively analyzed. The Epidemiological profile of all H1N1 cases were analysed with reference to age, sex and time wise distribution of morbidity and mortality.

Results: In Western Rajasthan, from 1st January 2013 to 31st March 2013, a total number of 1200 patients were tested for Influenza A H1N1, of which 17.6% (211) were found to be positive for the disease. Majority (63.1%, 131) of cases were females. The patients >15-45 years of age accounted for 65.9% (139) of the cases. Influenza A H1N1 resulted in death of 22.7% (48) of the total cases. Majority (64.6%, 31) of deaths occurred in females. The patients >15-45 years of age accounted for 75.0% of the deaths. 35.5% (75) of cases and 37.5% (18) 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 2013. Similar to H1N1 pandemic 2009, the incidence and mortality in 2013 in western Rajasthan was higher in young. H1N1 influenza can cause severe illness and deaths in pregnant and postpartum women.

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] In India first laboratory-confirmed case was reported from Hyderabad on 16th May 2009.[2] 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 2011 and 2012, Western Rajasthan reported little influenza activity.

In 2013 there was a sharp upsurge of influenza A H1N1 cases in north India.[4]In 2013 Rajasthan reported 3rd highest number of H1N1cases and 2nd highest number of deaths in the country. [4] Recent Influenza A H1N1 infection worsely affected the Western part of Rajasthan specially Jodhpur district.

This study is aimed to give an idea regarding the epidemiological trends of the H1N1dieases in Western Rajasthan in year 2013.

MATERIALS AND METHODS:

We retrospectively studied all confirmed cases of Influenza A H1N1, which occurred in Western Rajasthan during year 2013. All suspected cases of Influenza A H1N1 were confirmed by RT-PCR test.

Complete details of the all suspected and confirmed cases of H1N1 occurred during this period was taken in a questioner and patients were followed up until they have been cured/ died.

A confirmed case of pandemic H1N1 influenza A is defined as an individual with an influenza-like illness with laboratory-confirmed H1N1 influenza A virus detected by RT-PCR or culture.

Influenza-like illness (ILI) is defined as fever (temperature of 100°F [37.8°C] or greater) with cough or sore throat in the absence of a known cause other than influenza.

The Epidemiological profile of all H1N1 cases were analysed with reference to age, sex, time wise distribution of morbidity and mortality.

Data was analyzed using statistical SPSS software and using chi square test.

RESULTS:

A retrospective, descriptive study was carried out in Western Rajasthan to study the epidemiological profile of H1N1 cases from 1st January 2013 to 31st March 2013.

In this period, 1200 suspected patients were tested, of which 24.64 % (211) were found to be H1N1 positive. A total of 171 confirmed cases were admitted in the Influenza A H1N1 isolation wards, of which 28% (48 cases) succumbed to the disease. The case fatality ratio was found to be 22.7%. Cases reported from Jodhpur, Barmer, Jaisalmer, Pali, Nagour and Jalore district of the Western Rajasthan.The Maximum numbers of cases (64.4%, 131) were seen in Jodhpur district [Table 1].

Table 1: District wise distribution of Influenza A H1N1 cases and deaths from
1st January 2013 to 31st March 2013 in Western Rajasthan

District	No. of cases	No. of deaths
Jodhpur	136	25
Pali	17	3
Barmer	31	12
Jaisalmer	16	6

Volume : 3 | Issue : 5 | May 2013 | ISSN - 2249-555X

Nagour	9	2
Jalore	1	0
Sihori	1	0
Total	211	48

The number of Influenza A H1N1 cases gradually escalated from the month of September 2012 reaching a peak in the winter months. The Western Rajasthan had reported 211 cases in first three months of year 2013 (January-101 cases, February-85 cases, March-25 cases). Last positive case had reported on 28th March 2013.

From Table 2, it can be seen that of the total cases, 67.4% (131cases) were female and 32.6% (80 cases) were male. Influenza A H1N1 primarily affected the younger population, with patients >15-45 years age group accounting for 65.9% (139 cases) of the total cases [Table 2]. The age group of >15-30 years accounted for 43.6% (92 cases) and >30-45 years age group comprised 22.3% (47cases) of the total cases [Table 2]. Population at the extremes of age (0-15 and >60 years) formed 20.8% (12.3% and 8.5%, respectively) of the total positive patients [Table 2]. So 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.

Table 2: Morbidity and mortality due to Influenza A H1N1 from 1st January 2013 to 31st March 2013 in Western Rajasthan

Age Groups (Years)	Male				Female			
	H 1 N 1 Cases		H 1 N 1 Deaths		H1 N1 Cases		H1 N1 Deaths	
	No.	%	No.	%	No.	%	No.	%
0-15	20	25.0	1	5.9	6	4.6	1	3.2
>15-30	14	17.5	6	35.3	78	59.5	20	64.5
>30-45	15	18.8	3	17.6	32	24.4	7	22.6
>45-60	17	21.2	6	35.3	11	8.4	2	6.5
>60	14	17.5	1	5.9	4	3.1	1	3.2
Total	80	100	17	100	131	100	31	100

Out of total 211 Influenza A H1N1 cases 48 had expired with an overall case fatality ratio of 22.7%. All patients who died required intensive care and ventilator support. Maximum deaths occurred in Jodhpur district (25 deaths) followed by Barmer (12) [Table 1].

64.6% (31) deaths occurred in females and the rest occurred in males. It can be seen from table 2 that 75.0% deaths occurred in the age group >15-45 years, with 54.2% (26) deaths in the age group of >15-30years and 30.8% (10) deaths in the age group >30 to 45 years. Only 2 deaths had occurred in population at the extremes of age (0-15 and >60 years).

35.5% (75 out of 211) of total H1N1 cases and 56.6 % of total female cases (75 out of 131) have occurred in pregnant and postpartum women [Table 3].

Table 3: Pregnancy and H1N1 Infection

	No. of Cases	No. of Deaths	Case fatality ratio (%)
Pregnant	75	18	24.0
Non-Pregnant	56	13	23.2
Total	131	31	23.7

37.5% (18 out of 48) of total deaths and 58.1% of female deaths (18 out of 31) caused by H1N1 influenza A virus have occurred in pregnant and postpartum women [Table 3].

Of the 75 H1N1 positive pregnant and postpartum women 54 were pregnant and 21 were postpartum.

DISCUSSION

The Dr.S.N. Medical College, Jodhpur is a largest multispecialty tertiary care institution in Western Rajasthan. All the cases from 1st January 2013 to 31st March 2013 reporting to the Influenza A H1N1 screening centre, outpatient department and emergency department of Dr. SNMC were included in this study.

Cases reported 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 (64.4%, 136 out of 211) of cases reported from Jodhpur district.

Total 4,222 cases of Influenza A H1N1 were registered in the India in year 2013 (Till 24thMarch) with a case fatality ratio of 10.5% (445 deaths).[4]

Rajasthan reported 3rd highest number of H1N1cases and 2nd highest deaths in the country in year 2013.[4] Recent Influenza A H1N1 infection worsely affected the Western part of Rajasthan specially Jodhpur district. In Western Rajasthan a total number of 211 Influenza A H1N1cases and 48 deaths (case fatality ratio-22.7%) were reported in year 2013.

Present study reported case fatality ratio of Influenza A H1N-1was 21.0%. 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] 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 (62.1%) of cases were female and only 37.9% 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 (64.6%) 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.

65.9% of total cases and 75.0% 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. [5,8-11] 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]

In our study, approximately 35.5% of total cases and 37.5% of total 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] During previous influenza pandemics, increased rates of spontaneous abortion and preterm birth have been reported among pregnant women, especially in those with pneumonia. [13] In our study case fatality ratio of H1N1 influenza in pregnancy was found to be 24.0% (18 out of 75).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.

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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 2013 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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