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Research Paper

A Study of Outbreak of Swine Flu (H1N1) in North -West Zone of Rajasthan (Current Status -2015)

Medical Science

KEYWORDS : Swine flu, Pandemic, Influenza, Epidemic, Mortility

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ABSTRACT

Background: The outbreak of H1N1 virus had previously reported in India during 2009 flu pandemic. In 2015,the outbreak became widespread throughout India. The states of Gujarat and Rajasthan are severely affected. We study a outbreak of H1N1 Virus in north-west zone of rajasthan 2015 .

Objective: To demonstrate the current epidemiological scenario of swine flu (H1N1) in north-west zone of rajasthan with different demographic factors.

Methods: We screened total 6390 patients. Out of them 1405 samples of suspected cases collected from different parts of north-west rajasthan and analyzed by RT-PCR at Sardar Patel Medical College, Bikaner.

Results: A total of 1405 samples examined during three and half months period, out of which 181 cases found positive for H1N1. Out of them 85 (46.97%) males and 96 (53.03%) females (M:F=1:1.13). Most patients (116) affected in age group 21-50 years which is 64.09% of total positive cases (Mean age=37.09±16.07years). The mean time of onset of symptoms to hospitalization was 5.12±3.38 days. Only 11.05% patients presented within 48 hours whereas 64.09% presented between 3-5 days of onset of symptoms. 109 (60.22%) patients were from rural areas, whereas 72 (39.77%) belonged to urban areas. Total 13 (7.18%) deaths occurred among positive cases. 69.23% deaths were recorded in the age group of 25 to 50 years. The mean age of death being 44.69 years. Females had significant higher mortality (9 females out of 13 deaths). 76.92% died within 3 days of hospitalization, despite of starting Oseltamivir in a dose of 150 mg/bd on the day of admission. 84.61% of the patients who died had one or more risk factors. Bilateral pneumonia was observed in all the 13 patients and MODS in 2 patients.

Conclusions: with the above observation of swine flu trend it is likely that incidence is more in young to middle age group, majority of them having no risk factors, should form the focus of future studies. However fatality is highest in patients with co-morbid condition or predisposing risk factors need to vaccinate this group should form a scaffold on which future directions and interventions have to be built up to reduce the morbidity and mortality.. Females have slightly increased susceptibility for infection but mortality is much higher in this sex group . More patients belongs to rural areas reflecting the need of creating public awareness to present early at screening centres. The in-hospital mortality of 7.18% despite of starting Oseltamivir has raised concern about identifying the so called "Rapid Progressors" [76.92% died within 3 days of hospitalization]. Despite of all mortility is less in north-west zone as compared to rest of rajasthan.

INTRODUCTION

Influenza virus is a common human pathogen, and is responsible for serious respiratory illness and death over the past century. It always has potential to cause widespread pandemics whenever a new type of Influenza strain appeared in the human population and then spread easily from person to person[1]. The 1918–19 'Spanish' Influenza was the most devastating pandemic in recent history, with estimates of global mortality ranging from 20 to 50 million[4]. In April 2009, a new strain of Influenza A virus H1N1, commonly referred to as "swine flu," began to spread in several countries around the world. The recent H1N1 virus strain has been found to be closely related to the swine flu virus, but with a genetic composition that is quite different from the earlier known isolates. This novel virus presented genetic characteristics that had not been previously identified in Influenza A in humans, swine or poultry[2,3]. 2015 Indian swine flu outbreak refers to a outbreak of the 2009 pandemic H1N1 virus in India, which is still ongoing. The states of Gujarat and Rajasthan are the severely affected.

Material and Methods

This study was a observational study done at Sardar Patel Medical College, Bikaner in the Departmement of Medicine over a period of 3.5 months between 1st January and 15 April 2015. Nasal/Throat swabs were taken in VTM, after collecting relevant clinical information and epidemiological Information such as age, gender, underlying disease, travel history, close contact with confirmed case etc. from the patient. RNA was extracted using QIAamp viral RNA Mini Kit (Qiagen GmbH, Germany) and Real time RT-PCR was used for clinical confirmation of the presence of H1N1, at our advanced Microbiology Research Lab .

Observations and Results

A total of 1405 samples examined during three and half months period from 01 January to 15 april 2015. Total 181 cases found positive for H1N1. Most patients (116) affected in age group 21-50 years which is 64.09% of total positive cases (Mean age= 37.09 ± 16.07years) (Table 1).Out of them 85 (46.96%) males and 96 (53.03%) females (M:F= 1:1.13) (Table 2). Out of 96 females, 9 were pregnant. The mean time lag between symptom onset to hospitalization was 5.12±3.38 days. Maximum patients 64.09% arrived hospital during 3-5 days. Presence of comorbidity was an important contributing factor.

Sixty-seven patients (37.01%) had 1 or more co-morbid condition and 119 patients (65.74%) had no risk factors or comorbid illness. Age, Diabetes, chronic pulmonary diseases namely, COPD/bronchialasthma/ pulmonary tuberculosis, cardiac diseases, pregnancy, hypertension and Hypothyroidism are main comorbidities (Table 3). The rural to urban division of positive cases was 109 (60.22%) to 72 (39.77%) respectively. Total 13 (7.18%) deaths occurred among positive cases. 76.92% died within 3 days of hospitalization, despite of starting Oseltamivir in a dose of 150 mg/bd on the day of admission[5]. 69.23% deaths were recorded in the age group of 25 to 50 years. The mean age of death being 44.69 years and Females had significant higher mortality (9 females out of 13 deaths). 84.61% of mortility had predisposing risk factors. Bilateral pneumonia with ARDS were observed in all the 13 patients and MODS in 2 patients . All case fatalities were in category C at the time of admission. In the north west zone of rajasthan positive cases were mainly from Bikaner, Churu, Ganganagar, Hanumangarh, Nagaur etc.

Discussion

According to a study in 2009, the prevalence of Influenza A H1N1 was greatest among children and young adults, although older patients and patients with co-morbidities were more likely to experience worse clinical outcome[6]. Similarly,

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a study done in New Zealand concluded that, in 2009, Influenza A H1N1 predominantly affected young women with relative sparing of the elderly population[7]. 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%)[8]. In our study most patients (116) affected in age group 21-50 years which is 64.09% of total positive cases (Mean age=37.09±16.07years) .

Regan et al[9], the mean interval between onset of symptoms to hospitalization was 3 days, whereas Fajardo-Dolci et al from Mexico in 2009 reported a mean interval of 6.3 days[10]. In our study mean interval between onset of symptom to hospitalization was 5.12 ± 3.38 days. Majority of the patients (64.09%) presented between 3 to 5 days of symptom-onset.

In our study 13 (7.18%) deaths occurred among positive cases. 69.23% deaths were recorded in the age group of 25 to 50 years. The mean age of death being 44.69 years. Regan et al[9], also recorded a mean age of death 45 years. According to our study 7.69% patients who died presented within 48 hours of onset of symptoms, while the majority, 72.92% presented within 5 days of symptom onset. This probably indicates an overwhelming virulence of virus. In all 13 patients with radiological signs of bilateral pneumonia and early onset of respiratory failure, despite initiation of Oseltamivir on the day of admission or prior to admission, were implies that Oseltamivir may not be effective if pneumonia has already set in rapidly. The "critical phase" in influenza starts much earlier so need to identify the factors of these rapid progressors shall remain a difficult task.

Among the major predisposing risk factors diabetes was seen in 15.38%, chronic lung conditions in 15.38, pregnancy in 23.07%. 84.61% of the patients who died had one or more risk factors.

The current epidemic was analyzed for demonstrating 2015 outbreak scenario in north-west zone of rajasthan occurred from 1st January 2015 to 15 april 2015. The noteworthy features were rapid progression of disease and high early mortality.

Conclusion

with the above observation of swine flu trend it is likely that incidence is more in young to middle age group majority of them having no risk factors, however fatality is highest in patients with co-morbid condition or predisposing risk factors need to vaccinate this group and identify and treat them as early as possible with self precaution and prophylaxis of patients who have major predisposing conditions such as chronic lung diseases (COPD, Bronchial asthma, old treated Koch's), cardiac diseases, diabetes, Pregnancy etc. Females have slightly increased susceptibility for infection but mortality was much higher in this sex group (69.23%) with pregnancy was major predisposing condition showing 33.33% mortility. Mostly patients belongs to rural areas reflecting the urgent need of creating public health awareness to present early at screening centres. Hospital mortality of 7.18% despite of starting Oseltamivir has raised concern about identifying the so called "Rapid Progressors" [76.92% died within 3 days of hospitalization]. In comparision with another zone of rajasthan, mortility is low in north-west zone.

Acknowledgement

The outbreak of swine flu and sudden increase in cases at the beginning of month of february 2015 led to formation of swine flu team organized by the State Government of Rajasthan to defeat H1N1. The team of our centre including Dr. RA Bumb, Principle & controller, Dr. KK Verma, Medical superintendent, Dr. RP Agarwal, Professor & Head of department of medicine, Dr. Surendra kumar, Nodal officer, Dr. Rekha Acharya, PSM Deparment, Dr. Madhu saxena, HOD Anaesthesia, Dr. Abhishek Binani, Dr. BP Sharma, Department of microbiology. The chairman of this task force was none other than the eminent physician and neurologist Padmashree Dr. Ashok panagariya (Professor Emeritus), along with Mr. J.C Mohanty, Principal Secretary, Department of Medical Education, Mr. Mukesh Sharma, Principal Secretary, Department of Health, Dr. S.P. Singh, Joint Secretary, Department of Medical Education, Government of Rajasthan. The authors thankfully acknowledge their guidance, and support for this work.

Table 1: Age-wise distribution of cases

Age group (years)	No. of patients	%
0-10	13	7.18
11-20	13	7.18
21-30	38	20.99
31-40	36	19.89
41-50	42	23.20
51-60	27	14.91
>60	12	6.62

Table2: Sex-wise distribution of cases

	No.of patients	percentage
Total positive cases	181	100
Total Male	85	46.96
Total Females	96	53.03
Pregnant females	09	4.97

Table 3: Duration of illness

Time lag	No. of patients	%
Within 24 hours	3	1.65
24-48 hours	17	9.39
3-5 days	116	64.09
6-7 days	27	14.91
>7 days	18	9.94

Table 4: Predisposing risk factors /comorbid conditions

No.	Co-morbid condition/predisposing factors	No. of patients
1	Chronic lung diseases	11
2	Cardiovascular diseases	8
3	Diabetes	5
4	Hypertension	6
5	Hypothyroidism	6
6	Severe Anaemia	4
7	Chronic liver disease	1
8	Pregnancy	9
9	Renal diseases	1
10	Malignancy	2
11	Below 5 year age	12
12	Above 60 year age	12
13	No risk factor	119

Table5: Complications in 13 deaths

Complications	Deaths %
Bilateral pneumonia with ARDS*	13(100%)
Multiple organ dysfunction (MODS)	2(15.38%)

***Acute Respiratory Distress Syndrome**

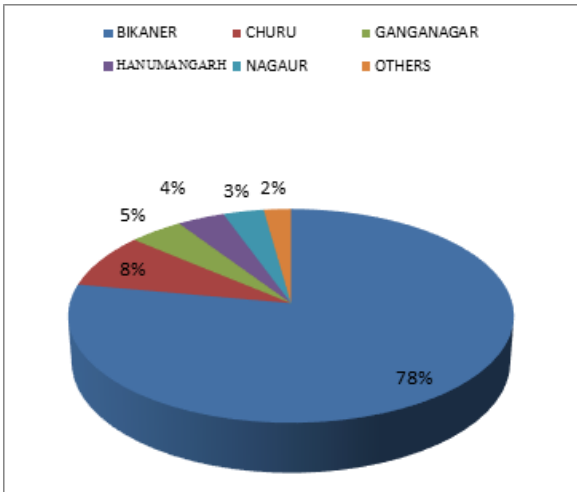

Figure 1: Distribution of positive cases of H1N1 in North-West Rajasthan

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