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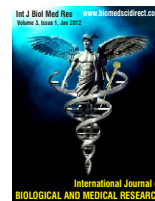
Original article

Clinico-Epidemiological Profile Of Patients Of H1N1 Influenza (Swine Flu) Virus Infection At A Tertiary Care Hospital in Maharashtra

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A R T I C L E   I N F O

A B S T R A C T

Present study was conducted to study clinico-epidemiological profile of swine flu patients at Government Medical College, Akola, located in Maharashtra state of India. Patients diagnosed in the year 2009 and 2010 were included in the study. Detail information regarding each patient was collected using predesigned proforma. Data was tabulated and analyzed using computerized statistical softwares. Out of total 312 suspected patients 60 (19.23%) were found positive for swine flu on throat swab examination. The incidence of H1N1 Influenza was high in the month of August and September when maximum (82.35% in 2009 and 76.92% in 2010) cases were detected. Out of 60 positive patients, 24 (40%) had history of travel to swine flu affected areas, 11 (18.33%) had history of contact with swine flu cases and 6 (10%) had history of both travel and contact. Majority of patients presented with fever (96.67%) and cough (91.67%). No death was recorded among all confirmed patients. Mean duration of hospital stay was 4 days (range 2-13 days). Majority (76.67%) of patients recovered without any complication. Among the rest, pneumonia (13.33%) was the most common complication. Smoking (23.33%) was found as the most common risk factor followed by alcoholism

1.Introduction:

First detected in Mexico in April 2009, H1N1 influenza virus was originally referred as "swine flu" because many of the genes in this new strain were found in pigs in USA. It has been now found that H1N1 influenza virus is genetically "quadruple reassortant" of two swine strains, one human strain and one avian strain of influenza virus, large proportion of genes coming from swine strain[1,2].

Initially coined as an "outbreak", the stint began in the state of Veracruz, Mexico, with evidence that there had been an ongoing epidemic for months before it was officially recognized as such[3]. Then it spread globally very fast. In June 2009, WHO declared the outbreak as a pandemic. The pandemic began to taper off in November 2009 and by May 2010, the number of cases was in steep decline. On 10 August 2010, WHO announced the end of the H1N1 pandemic and declared that the H1N1 influenza event had moved into the post-pandemic period [4]

Soon after the outbreak of H1N1 virus in the USA and Mexico in March 2009, the Government of India started screening people coming from the affected countries at airports for swine flu symptoms. The first case of swine flu in India was found at the Hyderabad airport on 13 May, when a man traveling from USA to India was found H1N1 positive. Subsequently, more confirmed cases were reported and as the rate of transmission of the flu increased in the beginning of August, with the first death due to swine flu in India in Pune, Maharashtra panic began to spread [5].

As of 2nd January 2011, 46412 cases of swine flu have been confirmed with 2728 deaths in India. Out of them 9972 cases and 937 deaths were from Maharashtra state [6].

2.Material And Methods:-

This cross sectional study was conducted at Government Medical College, Akola, situated in Vidarbha region of Maharashtra state of India in the year 2009 and 2010. The permission of head of institution and clearance from ethical committee was obtained before starting the study.

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A suspected case was defined as an influenza like illness (temperature37.50 C and at least one of the following symptoms: sore throat, cough, rhinorrhea or nasal congestion) and either history of travel to a country where infection had been reported in the previous seven days or an epidemiologic link to a person with confirmed or suspected infection in the previous seven days7

A confirmed case was defined by a positive result of real time reverse transcriptase polymerase chain reaction (RT-PCR) assay performed at a laboratory operated under the auspices of the state government7

During the year 2009 and 2010 throat swab samples of 312 suspected patients were sent for RT-PCR test. Out of them 60 patients were found positive for swine flu. For these patients a preformed questioner was made to record about age, sex, rural-urban setting, history of travel, history of contact, symptomatology, complication, treatment and outcome ensuring confidentiality after informed consent and guarantee of anonymity to the individuals.

The data was analyzed by suitable statistical tests wherever required using computer softwares.

3.Results:-

Out of total 312 suspected patients 60 (19.23%) were found positive for swine flu on throat swab examination.

The incidence of H1N1 Influenza was high in the month of August and September when maximum (82.35% in 2009 and 76.92% in 2010) number of cases were detected. Another peak was observed in November and December (11.76% in 2009 and 15.39% in 2010).

Agewise distribution of patients showed that maximum number (51.76%) of patients were from 16 to 25 years age group, followed by 36 to 45 years (26.67%). Median age was 21 years.

Among those 60 positives, male patients (44 i.e. 73.33%) outnumbered female patients (16 i.e.26.67%).

75% patients were resident of rural area and 25% were of urban one.

Out of 60 positive patients, 24 (40%) had history of travel to swine flu affected areas, 11 (18.33%) had history of contact with swine flu cases and 6 (10%) had history of both travel and contact.

Majority of patients presented with fever (96.67%) and cough (91.67%). Sore throat (70.67%), nasal catarrh (66.67%) and difficulty in breathing (46.67%) were other symptoms on presentation. Only 45.00% and 11.67% had history of headache and vomiting respectively.

The median duration of diagnosis of infection was 4 days after the onset of illness (range was 1-12 days).

No death was recorded among all confirmed patients. Mean duration of hospital stay was 4 days (range 2-13 days). They were treated with oseltamivir, antibiotics and symptomatic management.

Majority (76.67%) of patients recovered without any complication. Among the rest, pneumonia (13.33%) was the most common complication followed by exacerbation of bronchitis/bronchial asthma (6.67%) and sinusitis (3.33%).

Smoking (23.33%) was found as the most common risk factor followed by alcoholism (16.67%) and bronchitis (13.33%). 36 (60%) patients were not having any risk factor.

Table No. 1:- Epidemiological Features of Swine Flu Patients

Year Patients	2009		2010		Total	
	No.	%	No.	%	No.	%
Agewise distribution of patients						
<15	0	0.00	0	0.00	0	0.00
16-20	5	14.71	5	19.23	10	16.67
21-25	9	26.47	12	46.15	21	35.00
26-30	2	5.88	3	11.54	5	8.33
31-35	0	0.00	0	0.00	0	0.00
36-40	7	20.59	0	0.00	7	11.67
41-45	5	14.71	4	15.38	9	15.00
46-50	2	5.88	0	0.00	2	3.33
50-55	4	11.76	2	7.69	6	10.00
>55	0	0.00	0	0.00	0	0.00
Total	34	100.00	26	100.00	60	100.00
Genderwise distribution of patients						
Male	28	82.35	16	61.54	44	73.33
Female	6	17.65	10	38.46	16	26.67
Total	34	100.00	26	100.00	60	100.00
Area wise distribution of patients						
Rural	27	79.41	18	69.23	45	75.00
Urban	7	20.59	8	30.77	15	25.00
Total	34	100.00	26	100.00	60	100.00
Contact History wise distribution of patients						
Positive	08	23.53	3	11.54	11	18.33
Negative	26	76.47	23	88.46	49	81.67
Total	34	100.00	26	100.00	60	100.00
Travel History wise distribution of patients						
Positive	18	52.94	6	23.08	24	40.00
Negative	16	47.06	20	76.92	36	60.00
Total	34	100.00	26	100.00	60	100.00

Table No. 2:- Monthwise Distribution of Patients

Month	Year 2009		2010		Total	
	No.	%	No.	%	No.	%
Agewise distribution of patients						
January	0	0.00	0	0.00	0	0
February	0	0.00	0	0.00	0	0.00
March	0	0.00	0	0.00	0	0.00
April	0	0.00	0	0.00	0	0.00
May	0	0.00	0	0.00	0	0.00
June	1	2.94	1	3.85	2	3.33
July	1	2.94	1	3.85	2	3.33
August	10	29.41	8	30.77	18	30.00
September	18	52.94	12	46.15	30	50.00
October	0	0.00	0	0.00	0	0.00
November	2	5.88	3	11.54	5	8.33
December	2	5.88	1	3.85	3	5.00
Total	34	100.00	26	100.00	60	100.00
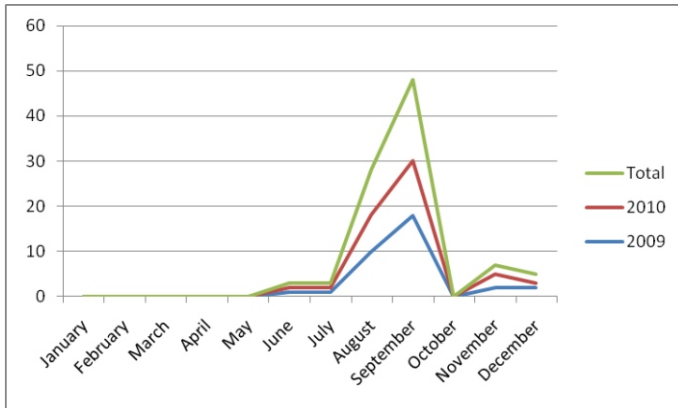
Table No 3:- Symptoms On Presentation

Symptoms	No*	%
Fever	58	96.67
Cough	55	91.67
Sore Throat	43	71.67
Nasal Catarrh	40	66.67
Difficulty in Breathing	28	46.67
Headache	27	45.00
Vomiting	7	11.67

*Multiple Responses

Table No 4:- Clinical Profile of Patients

	No	%
Duration of Hospital stay (in Days)		
<2	17	28.33
3 to 5	26	43.33
6 to 10	14	23.33
>10	3	5.00
Total	60	100.00
Time Interval from onset to diagnosis (in Days)		
<1	2	3.33
1 to 45	33	55.00
to 10	20	33.33
>10	5	8.33
Total	60	100.00
Complications		
No Complication	46	76.67
Pneumonia	8	13.33
Exacerbation of bronchitis or Bronchial Asthma	4	6.67
Sinusitis	2	3.33
Total	60	100.00
Risk Factors*		
No Risk Factor	36	60.00
Smoking	14	23.33
Alcoholism	10	16.67
Bronchitis	8	13.33
Diabetes	6	10.00
Asthma	4	6.67
Hypertension	3	5.00

4.Discussion:-

The present study had described clinico-epidemioligical profile of patients with H1N1 influenza (Swine Flu) virus infection at Government Medical College, Akola.

Overall 60 patients were found positive for swine flu (H1N1 Influenza) among 312 suspected patients in the year 2009 and 2010 (36 in 2009 and 24 in 2010).

Akola is a small town located in Vidarbha region of Maharashtra state in India, having total population of 427146. It is far away from metropolitan cities (Mumbai, Pune and Nagpur) of Maharashtra state. Its climate is hot (average maximum and minimum temperature 34.570C and 20.65oC respectively) and rainfall is very low (average rainfall 730 mm). These reasons might be responsible for less number of swine flu patients in the present study at Akola as compared to other studies [8-11] conducted in India.

Time trend for occurrence of swine flu cases was characteristic and same for both years. Maximum (82.35% in 2009 and 76.92% in 2010) cases were detected in the month of August and September. Another peak was observed in November and December (11.76% in 2009 and 15.39% in 2010). In a review of weekly trends in the incidence of swine flu in India, increase in similar months in the year 2009 and 2010 has also been documented [12]. This fact signified direct relationship between occurrence of swine flu with rainy season and winter as its transmission is more when humidity is high and temperature is low. This typical seasonality was also recorded in various studies from India [9-13] as well as from other countries [14-16].

Unlike most strains of influenza, H1N1 does not disproportionately infect adults older than 60 years; this was an unusual and characteristic feature of the H1N1 pandemic [17]. In our study oldest patient was of 52 years. More than half of the patients (51.67%) were in the age group of 16-25 years. It was in accordance with the results of study at Surat [11] where maximum (70.77%) patients were from 15-50 years age group. Similarly in a study done at California [18], hospitalization rates were highest for young adults (age 18-29 years). These findings are in contrast with the studies done at Mexico [19] and USA [15] where H1N1 influenza was common at extremes of age groups (<15 years and >65 years). Possible explanation for this may be that maximum number of patients at small town had infection due to travel to affected area and young have grater susceptibility of virus.

The overall male patients outnumbered female patients (44/16). This male predominance was also observed by A. Puvalingam et al [10], K. N. Bhatta et al [11] and Rajesh Chudasama et al [9]. Review of data from Ministry of Health and family Welfare, Government of India, had clearly depicted the male predominance among all age groups from all over the country [12].This might be due to more outdoor activity and traveling leading to higher chances of acquiring infection among males than that of females, especially in developing countries like India.

Patients from rural area (75%) were comparatively more than urban area (25%). The rural predominance might be due to the fact

that Govt. Medical College, Akola (where present study was conducted) has to serve more rural population than urban population unlike Delhi or Mumbai.

In the present study 40% patients had history of travel to swine flu affected areas 18.33% had history of contact with swine flu patients and 10% had history of both travel and contact, thus demonstrating presence of diseases in community. (History of contact of patients had been in contact with a case of swine flu in the past seven days, history of travel to the areas where there is one or more confirmed cases in past seven days [7].) Comparable findings were documented by Riyaz Basha S et al [8] with this respect. Among other studies, majority (76.5%) of swine flu patients had significant travel history in China at one end and negligible (1.1%) had it in Saurashtra, India at other end [9].

The most common clinical manifestations were fever (96.67%) and cough (91.67%) followed by sore throat (71.67%), nasal catarrh (66.67%) and difficulty in breathing (46.67%). Headache (45.00%) and vomiting (11.67%) were the least narrated complaints. Various Indian studies [8-11] had revealed fever and cough as the most common symptoms, told by more than 90% of total confirmed swine flu patients. Similar observations were recorded in the study at California [21]. Contrary to these findings, approximately one third of patients seen at two hospitals in Mexico had no fever at presentation [9].

The median time interval between the onset of illness to diagnosis of infection was found 4 days (range 2-20 days) which was very much similar to study at Rajkot [9] where it was 5 days (range 1-52 days). But in two other studies [15, 16] outside from India, this duration was comparatively less. The justification cited for this by Rajesh Chudsama et al [9] was that patients from rural areas and small towns were initially treated at local level by general practioner, but with no or little improvement after initial treatment, they were referred to higher centre. Same is applicable to present study also.

No death among confirmed swine flu patients was occurred at GMC, Akola. This may be due to less severe infection, possibly due to adverse climatic conditions at Akola. 23.2% and 24/824 deaths due to swine flu were reported by A. Puvalingam et al [10] and K. N. Bhatta et al [11] respectively.

Approximately ¾ of total patients did not suffer from any major complication. Only 18 (13.33%) patients had pneumonia and 4 (6.67%) had exacerbation of asthma or bronchitis. Rate of complication was comparatively less in present study than that by Rajesh Chudasma et al [l9] and A. Puvalingam et al [10]. Again it might be because of less severe infection, possibly due to adverse climatic conditions at Akola. But above two studies had also revealed pneumonia as a leading complication, similar to the present study.

No significant risk factor or co-morbid conditions were recorded in 60% of patients. Remaining 40% patients had one or more risk factors that can be related to contracting swine flu infections. Smoking (23.33%) and alcoholism (16.67%) were the most frequent among them. History of chronic respiratory

inflammatory conditions like bronchitis (13.33%) and asthma (6.67) was recorded. Also 13.33% patients were diabetic and 5.00% were hypertensive. Similar risk factors were documented in other studies [9-11], but with a different frequency. Unlike these studies, no pregnant woman was found positive for H1N1 influenza in the present study.

5.Conclusion:-

In the year 2009 and 2010, total 60 patients were diagnosed as a swine flu. In both the years incidence of swine flu peaked in the month of August and September, again in November and December, correlating to increase in humidity and decrease in temperature respectively. Almost half of the patients were from age group of 16-25 years. Male and rural patients outnumbered female and urban one. Fever and cough were the commonest symptom narrated by more than 90% of patients. No death was reported. Also proportion of complication was less (23.33%). Pneumonia was the most common complication among them. Comparatively few number of patients, low rate of complication along with absence of any death indicated less severe epidemic in Akola that may be related to climatic condition of the district and long distance from metro cities.

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