ORIGINAL RESEARCH PAPER

Volume-6 | Issue-10 | October-2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

TO STUDY CLINICAL PROFILE AND OUTCOME OF HOSPITALIZED SWINE FLU PATIENTS IN BIKANER ZONE OF RAJASTHAN

General Medicine

***Dr. Rahul Kumar Gupta** Senior Resident Department of Medicine *Corresponding Author

Dr. Ajeet Kumar Gadhwal Senior Resident Department of Medicine

Dr. R.P. Agrawal Principal & Controller, Sr. Professor & in charge DCRC S.P. Medical Collage Bikaner (Raj.)

ABSTRACT

Background: In 2015, the outbreak of H1N1 influenza pdm09 became widespread throughout India. States of Gujarat and Rajasthan are severely affected. We studied clinical profile and outcome of swine flu patients who were hospitalized during outbreak of H1N1 Virus in Bikaner zone of Rajasthan 2015.

Methods: we studied demographic profile clinical features laboratory parameters and outcome of 101 hospitalized H1N1 positive patients from January 2015 to April 2015.

Results: We studied 101 patients, Out of them 40.59%males and 59.41% females. Mean age was 41 ± 14years. 21.78% had history of contact and 5.94% had history of travel, 65% were from rural areas and 43.56% had at least one predisposing comorbid condition.Mean duration of symptoms to hospitalization was 3.74±2.21 days. Fever (86.14%), cough (81.19%), and breathlessness (79.21%) were most common symptoms. 72.27% presented with bilateral pneumonitis. 23.76% required mechanical ventilation. Abnormal laboratory findings include leukopenia (18.81%), leukocytosis (19.80%), derange RFT (5.94%); derange LFT (2.97%), dyselectrolytemia (4.95%) and respiratory acidosis (12.87%). Consolidation (34.56%) and Lower zone involvement (61.38%) were most common X-ray findings. Complications developed in 34.65%. Fatal outcome accounted for 12.87% cases. Female sex, residence (rural), presentation after 48 hours, Consolidation, lower zone involvement, SPO2 (<90%), abnormal ABG, ARDS, secondary infection and underlying comorbid condition were associated with poor outcome.

Conclusions: Specific factors that predict an increased risk for progressive disease are incompletely understood. Since H1N1 influenza RT-PCR is restricted to several centers and time consuming, a syndromic approach may be helpful in identifying patients on risk for severe disease and predict outcome. As 2009 pandemic evolved again continues investigations needed to define better clinical spectrum of disease and risk factor for severity of illness. Study will guide prevention and control activities and will allow modify strategies for case management.

KEYWORDS

Introduction

The major cause of health concern that claims a large number of lives worldwide every year are the infectious diseases. The advent of antibiotics and vaccines has lessened the impact of a number of infectious diseases but they are still the number one cause of mortality.[1]

These emerging infectious diseases can either be new emergent infections or rare infections that may reemerge occasionally.

Of all the infectious diseases, Influenza deserves the particular attention as it undergoes a high rate of antigenic change giving rise to a new type of Influenza strain for which there is no immunity in the population. Moreover in the absence of ready or preventive therapeutic interventions, it poses a great threat.[2]

During the 20th century, new strains of Influenza A viruses resulted in three Influenza pandemics: Spanish flu (1918-1919), Asian flu (1957-58), Hong Kong flu (1968-1969).[3, 4, 5] Swine origin Influenza has become the first Pandemic of the 21st century. New Influenza A virus (H1N1) originated from swine caused human infections, during the spring of 2009 in Mexico and then virus was disseminated worldwide.[6,7]

The H1N1 virus outbreak had previously occurred in India during the 2009 flu pandemic. The virus killed 981 people in 2009 and 1763 in 2010. The mortality decreased in 2011 to 75. It claimed 405 lives in 2012 and 699 lives in 2013. In 2014, 218 people died from the H1N1 flu. Till now, 2015 was the year which saw the worst outbreak of swine flu, with a total of 42,592 cases and deaths recorded at 2,990.

However, in 2016 the swine-related cases were 1,786 and deaths were 265. The country has so far recorded 22,186 cases, 1,094 swine flu-related deaths in 2017.

Most patients referred for treatment had symptoms like fever and cough that sometimes were associated with sore throat and rhinorrhoea.[8,9,10] The major clinical syndromes responsible for hospitalization and intensive care unit (ICU) admission were viral pneumonia with sever hypoxia, acute respiratory distress syndrome (ARDS), sometimes systemic shock, and renal failure.[11,12]

Radiological findings including mixed and disseminated interstitial infiltration and alveolar infiltration are common, although multilobar and lobar involvement, especially in patients with bacterial coinfection of the lower lobe is also seen.[13]

Material & Method

This was a cross-sectional epidemiological study on H1N1 Positive patients admitted in Swine flu ward/ICU over a period of 4 months from January 2015 to April 2015, conducted in the Department of Medicine, S.P. Medical College & associated Group of P.B.M. Hospitals, Bikaner.

Real time RT-PCR was used for clinical confirmation of the presence of H1N1. All patients age >14year and at least one chest X-ray or routine investigation were done included in study.

Results:

We screened total 6390 patients. 1405 samples of suspected cases collected from different parts of north-west Rajasthan, out of which 181 found to have positive test. A total number of 101 patients selected for study fulfilling the inclusion criteria.

Out of 101 H1N1 positive hospitalized patients, were 41 males and 60 were females. 67 patients were aware about swine flu and 66 patients had residence in rural areas. 22 patients had history of contact and 6 patients had history of travel to other state/country. 44 patients had at least one predisposing condition for severe disease. (Table: 1)

Out of 101 patients, 44 patients had at least one comorbid condition. Cardiovascular disease (17.82%), respiratory tract disease (14.85%), Anaemia (15.84%), pregnancy (8.91%), obesity (8.91%) (BMI>30 kg/m2), hypothyroidism(6.93%), diabetes (4.95%), CLD (0.99%), long term steroid use (0.99%), malignancy (0.99%) and post-operative status (0.99%) were major risk factor for hospitalization and severity of disease. **(Table: 2)** Majority of patients had greater than one comorbid condition.

In majority of patients, fever (86.14%), cough (81.19%), breathlessness (79.21%), running nose (37.62%), sore throat (32.67%) were main clinical symptoms which accounted for hospitalization. Head ache (26.73%), body ache (14.85%) chest pain/discomfort (11.88%), joint pain (11.88%), vomiting (8.91%), loose motion (7.92%) were other important symptoms. Epistaxis, pain abdomen, hemoptysis, seizure, and hematuria were present in minority of patients. (Graph)

On examination out of 101 patients, pyrexia (86.13%), tachycardia (68.31%),tachypnea (64.35%), labored breathing (40.59%), hypotension (25.74%) crepts (78.21%) wheezes(16.83%) altered mental status (6.93%)were main clinical findings.

Hematological and biochemical parameters include Leukopenia (18.81%), Leukocytosis (19.80%), thrombocytopenia (2.97%) and anemia (15.84%), derange renal function test (Serum creatinine more than 1.5mg/dl) (5.94%) and had derange liver function test (2.97%) (SGPT/SGOT more than 3 time of normal) and hyponatrenmia (4.95%). ABG was suggestive of respiratory acidosis in 12.87%, respiratory alkalosis in 5.94%, metabolic acidosis in 2.97%, and respiratory acidosis -metabolic acidosis in 2.97%. 76 patients had normal ABG findings.

Consolidation (34.56%) was most common radiological finding followed by interstitial opacity (21.78%0, ground glass opacity(17.78%), both consolidation and ground glass opacity (2.97%)and both interstitial opacity and consolidation(0.99%) at initial chest X-ray. 2.97% patients developed pleural effusion, lesion confined to upper lobe (13.86%), middle lobe lesion (28.71%) and lower zone (61.38%), Isolated upper, middle, lower zones were involved in 1.98%, 10.89 and 47.52% respectively. Lesions were bilateral in 72.28% and unilateral in 5.94% patients. 20.80% patients had normal chest X-ray at the time of hospitalization. (Table: 3)

Out of 101 patients 34.56% patients developed at least one complication, including secondary infection(20.79%),ARDS (17.82%) shock (6.93%), dyselectrolytemia (4.95%), MODS (2.97%), AKI (2.97%), Myocardial infarction (0.99%). Majority of patients developed multiple complications. 23.76% patients needed mechanical ventilation. 13 patients (12.87%) died and 88 patients (87.12%) improved and discharged from hospital.

Out of 13 fatal cases 9 were female (69.23%), 11 were age <60 year old (84.61%), 11 had residence in rural areas (84.61%). 11 (84.61%) had late presentation (Duration of symptoms to hospital visit >48 hours). On X- Ray chest, infiltrate or consolidation was present in all 13 patients (100%) and lower zone involvement in 11 patients (84.61%). All 13 (100%) had SPO_2 <90% and, 8 (61.53%) had abnormal blood pH at hospitalization. ARDS in 13 (100%), secondary infection in 5 (38.46%), MODS in 2 (15.38%) AKI in 2(15.38%) and NSTEMI in 1 (7.69%) were common complications associated with mortality . 11 (84.61%) had at least one underlying co morbid condition including chronic respiratory condition in 1 (7.6%), cardiovascular disease in 3 (23.07%), pregnancy in 3 (23.07%), anemia in 3 (23.07%), diabetes in 2 (15.38%), and malignancy in 1 (7.6%) . 6 (46.14%) had more than one co morbid condition .

Discussion

Seasonal influenza primarily affects very young or elderly persons but hallmark of pandemic influenza is that it affects young healthy adults. In our study demographic profile of 101 hospitalized patients revealed that mean age was 41.77 years (range was 15 to 70 years). Maximum patients 67(66.34%) were between age group of 15 to 50 years.

In our study significant number of patients (21.78%) had history of contact with H1N1 positive patients. 6 patients (5.94%) gave history of travel to other state/country. So public awareness is important tool in prevention of this contagious disease.

In our study mean duration between onset of symptom and hospitalization was 4.2 days. Lee CS et al[14], the sum of symptom was high during first 4 days. Shi – xiang Wang et al[15] the median incubation period was 4 days (range 1 to 7 days).

In our study Out of 101 patients, 44 patients had at least one comorbid condition. Our study had similar findings to Hashemian et al[16], 45% patients had underline comorbid condition. M. Bassettil et al[17] 69% had an underlying medical condition.

In our study, fever (86.14%), cough (81.19%), breathlessness (79.21%), running nose (37.62%), sore throat (32.67%) were main clinical symptoms which accounted for hospitalization. Our results are comparable to Hashemian et al[16.] cough (95%) dyspnea (90%) hemoptysis (55%), fever (90%), diarrhea vomiting were main clinical symptoms.

78.21% patients had pneumonia at the time of admission in our study. Our results are consistent with M. Bassetti et al[17] 63% patients had pneumonia at the time of admission.

In our study Abnormal laboratory findings include leukopenia (18.81%), leukocytosis (19.80%), derange RFT (5.94%); derange LFT (2.97%), dyselectrolytemia (4.95%) and respiratory acidosis (12.87%). Similar to our study, M. Bassatti et al[17] leukopenia (31%), leukocytosis (16%), thrombocytopenia (27%), AST, ALT elevation in (5%) were selected laboratory abnormality in H1N1 positive patients.

In our study, most common radiographic abnormality was consolidation (34.56%) followed by interstitial opacity (21.78%), ground glass opacity (17.78%).

Our study have similarities to Norzailin AB et al[18] , consolidation was the common abnormality observed in chest X-rays present in 50% of cases followed by interstitial opacities and ground glass opacities and mostly located in lower zones.

In our study 13 patients died due to complications including ARDS in 13 patients (100%), shock in 5 patients (38.46%), secondary infection in 5 patients (38.46%), dyselectrolytemia in 4 patients (30.76%), MODS in 2 patients (15.38%), AKI in 2 patients (15.38%) and myocardial infarction in 1 patient (7.69%) . Raman Sharma et al[19] ARDS was observed in all the 76 patients, septicaemia in 21.12%, MODS in 30.26% and AKI in 9.21%.

A higher prevalence of chronic medical conditions known to increase risk of severe influenza, delayed or reduced access to healthcare, cultural differences in healthcare seeking behavior and approaches to health, potential differences in genetic susceptibility, and social inequalities. More research is needed to better understand and quantify the increased risk of severe H1N1 pandemic disease among these groups.

This study included only hospitalized patients of a tertiary care institute; so, analysis may not reflect the actual distribution of the cases at the population level.

CONCLUSION

A wide range of pathogens can cause influenza-like illness (ILI); clinical diagnosis of influenza should be guided by clinical and epidemiologic data and can be confirmed by laboratory tests. However, initial treatment decisions should be based on clinical presentation and epidemiological data and should not be delayed pending laboratory confirmation.

Since H1N1 influenza RT-PCR is restricted to several centres and time consuming, a syndromic approach may be helpful in identifying patients on risk for severe disease and predict outcome. Clinicians and caregivers should watch for signs of possible clinical deterioration, assess for underlying co-morbid conditions and refer such patients immediately to hospital.

To conclude swine flu should be consider as a differential diagnosis for patients presenting with fever, respiratory illness or pneumonia. As 2009 pandemic evolved again continues investigations needed to define better clinical spectrum of disease and risk factor for severity of illness.

Our study and analysis of results contributes to better understanding of critical clinical and epidemiological features of the H1N1 influenza. Study will guide prevention and control activities and will allow health-care providers and public health authorities to modify their strategies for case management, community mitigation, and health resource allocation. This will reduce the impact of inaccurate and unconfirmed rumors.

Table: 1Demographic profile of H1N1 positive patients who were hospitalized

Characteristics	Number	Percentage
Age group (20-50 year)	67	66.33
Male	41	40.59
Female	60	59.41
Residence(rural)	66	65.34
Residence (urban)	35	34.66
History of contact	22	21.78
History of travel to other state/country	6	5.94
Aware ness about swine flu	67	66.33
Predisposing condition	44	43.56

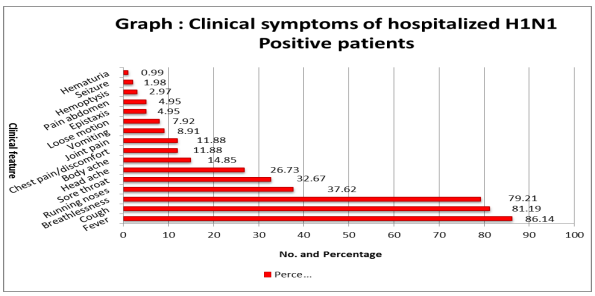
Table: 2 predisposing factors associated with hospitalization in H1N1 Positive patients

Predisposing factor	Number (%)
Cardiovascular disease	18(17.82)
Anaemia	16(15.84)
Respiratory disease	15(14.85)
Obesity	9(8.91)
Pregnancy	9(8.91)
Hypothyroidism	7(6.93)
Diabetes	5(4.95)
Others	4(3.96)

Table: 3 Radiological features at the time of hospitalization in H1N1 Positive patients

Radiological features	Number	Percentag
Consolidation	35	34.56
Interstitial opacity	22	21.78
Ground glass opacity	18	17.82
consolidation+ Ground glass opacity	3	2.97
Interstitial opacity+ consolidation	1	0.99
Fibrosis	3	2.97
Pleural effusion	3	2.97
Upper Zone	14	13.86
Middle Zone	29	28.71
Lower Zone	62	61.38
Isolated Upper Zone	2	1.98
Isolated Middle Zone	11	10.89
Isolated Lower Zone	48	47.52
Normal	21	20.80

Graph : Clinical symptoms assosiated with hospitalization in H1N1 Positive patients



References

1) Ministry of Health. U K 1920 Report on the pandemic of influenza, 1918-19; Rep. Health Med. Subjects 4 182
2) Ridley R G 2004 Research on infectious diseases better coordination; Nat. Med. 10 S137
3) "History lessons: the Asian flu pandemic" Br J Gen Pract. 2009 Aug 1; 59(565): 622–623. Doi: 10.3399/bjgp09X453882 PMCID: PMC2714797
4) Hatta, M., Gao, P., Halfmann, P. &Kawaoka, Y. Molecular basis of high virulence of Hong Kong H5N1 influenza A viruses. Science 7, 1840–1842 (2001)
5) Webster RG1, Guan Y, Poon L, Krauss S, Webby R, Govorkovai E, Peiris M. etal.The spread of the H5N1 bird flu epidemic in Asia in 2004. Virol Suppl. 2005 ;(19):117-29.
6) Echevarria. Zuno S, Mejia-Arangure JM, Mar-Obeso AJ, Grajales-Muniz C, Robles-Perez E, Gonzalez-Leon M, et al. Infection and death from influenza A H1N1 virus in Mexico: A retrospective analysis. Lancet 2009; 374:2072-9.
7) Perez-Padilla R, de la Rosa-Zamboni D, Ponce de Leon S, Hernandez M, Quinones-Falconi F, Bautista E, et al. Pneumonia and respiratory failure from swine-origin influenza A (H1N1) in Mexico. N Engl J Med 2009; 361:680-9.
8) Brown, I. H., Harris, P. A., McCauley, J. W. & Alexander, D. J. Multiple genetic reassortment of avian and human influenza A viruses in European pigs, resulting in the emergence of an H1N2 virus of novel genotype. J. Gen. Virol. 79, 2947-2955 (1998).
9) Newman, A. P. et al. Human case of swine influenza A (H1N1) triplereassortant virus infection, Wisconsin. Emerg. Infect. Dis. 14, 1470-1472 (2008)
10) Novel Swine-Origin Influenza A (H1N1) Virus Investigation Team Emergence of a novel swine-origin influenza A (H1N1) virus in humans. N Engl J Med 2009; 360:2605-2615
11) The ANZIC Influenza Investigators, Webb SA, Pettilä V, Seppelt I, Bellomo R, Bailey M, Cooper DJ, et al. Critical care services and 2009 H1N1 influenza in Australia and New Zealand. N Engl J Med 2009; 361:1925-34.
12) Kumar A, Zarychanski R, Pinto R, Cook DJ, Marshall J, Lacroix J, et al. Critically ill patients with 2009 influenza A (H1N1) infection in Canada. JAMA 2009; 302:1872-9
13) Jain S, Kamimoto L, Bramley AM, Schmitz AM, Benoit SR, Louie J, et al. Hospitalized patients with 2009 H1N1 influenza in the United States, April–June 2009. N Engl J Med 2009; 361:1935-44.
14) Lee CS, Lee JH et al Dynamics of clinical symptoms in patients with pandemic influenza A (H1N1). ClinMicrobiol Infect. 2010 Apr; 16(4):389-90.
15) Han Li Shi-xiang Wang et al. "Clinical Features of 2009 Pandemic Influenza A (H1N1) Virus Infection in Chronic Haemodialysis Patients". Blood Purif 2010; 30:172-17.
16) Hashemian SM, Tabarsi P, Nadji SA, Jamaati H, Mohajerani SA, Shamaee M, Chitsazan M, Radmand G, Maadani M, Mansouri SD. Secondary infection and clinical aspects after pandemic swine-origin influenza a (H1N1) admission in an Iranian critical care unite. Int J CritIllnInjSci 2014; 4:309-13.
17) M. Bassetti1, A. Parisini1, A. Calzi1, F. M. BobbioPallavicini et al Risk factors for severe complications of the novel influenza A (H1N1): analysis of Patients hospitalized in Italy, Article published online: 1 June 2010 ClinMicrobiol Infect 2011; 17: 247–250 (10.1111/j.1469-0691.2010.03275.x)
18) Norzailin Abu Bakar, MMED (Radiologi), Norhafizah Ehsan, MMED (Radiologi) et al Chest Radiograph Findings In Novel Swine-Origin Influenza A (H1N1) Virus (S-OIV) Infection: A UKMMC Experience. Med J Malaysia Vol 70 No 2 April 2015; 93-97.
19) Raman Sharma1, SujataAgarwal et al Profiling the Mortality due to Influenza A (H1N1) pdm09 at a Tertiary Care Hospital in Jaipur during the Current Season - January &February 2015. Journal of The Association of Physicians of India April 2015; Vol. 63 pg. 36-39.