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Original Research Article

Retrospective study of clinical profile and management of patients with swine flu at tertiary care hospital

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ABSTRACT

Background: The first isolation of a swine influenza virus from a human occurred in 1974. There are no unique clinical features that distinguish swine influenza in humans from typical influenza. Thus, clinical course and management were recorded as per a planned pro forma and analysed. This type of study has not been done previously in Himalayan region.
Methods: Retrospective observational study done in a group of patients diagnosed with swine flu admitted in department of pulmonary medicine at the tertiary care hospital from November 2016 to July 2017.
Results: Out of 30 patients, 53.3% were male, mean age was 48.8±17.7, history of travel or contact to infected person was only 13.3%. Most common symptom recorded was fever (83.3%), followed by dyspnoea, cough, throat pain. Most common co-morbidity was diabetes and presence were significantly associated with admission in an ICU ($P<0.05$). Bilateral lung infiltrate seen in 53.3% on chest X-ray. Organ involved other than respiratory were renal followed by liver involvement. 40% of patients received corticosteroid for an average of 6days, mostly given in patients with sepsis, septic shock, multi organ involvement. Out of 40%, 16.6% patient expired, 6.6% left against medical advice and 16.6% were discharged, corticosteroid doesn't help in reducing mortality.
Conclusions: A multivariate model to identify independent predictors associated with mortality in swine flu were the use of vasopressor, respiratory failure, requirement of mechanical ventilation and number of organ failure. Use of corticosteroid is controversial.

Keywords: Corticosteroids, Mortality, Swine flu

INTRODUCTION

In 1918-1919 during Spanish influenza pandemic, influenza as a disease of pigs was first recognized. The illness was first to be described by veterinarian J. S. Koen.[1] Shope RE in 1930 were first to isolate influenza virus from pigs.[2] In 1974, swine influenza virus was first isolated in human, confirming speculation that swine-origin influenza viruses could infect humans.[3] In interspecies transmission of influenza pigs are thought to have an important role because they have receptors to both avian and human influenza virus strains.[4] Influenza is an acute infection of respiratory tract, caused by influenza virus. This virus is under the family of Orthomyxoviridae. There are three subtype of this virus that is type A, B and C.

Among them influenza A virus has 2 distinct antigens on its surface namely the haemagglutinin (H) and the neuraminidase (N). This influenza virus has a unique property of frequent major and minor antigenic variation, called antigenic shift and drift respectively.[5] This

antigenic variation is responsible for major epidemic or pandemic affecting most or all age group. Clinico-epidemiological profile of the H1N1 infected patients varies from place to place and from time to time.[6] Hence author recorded, analyzed clinical presentation, the clinical course and management (corticosteroids) in the institute as such study has not been done previously in Himalayan region.

METHODS

This was a retrospective observational study done in a group of patients diagnosed with H1N1 influenza admitted in department of pulmonary medicine at tertiary care hospital over a period of 9months (November 2016 to July 2017). Male and female patients aged over 18years that were determined to have H1N1 were incorporated in the study. H1N1 flu was suspected in patients with individual with intense febrile respiratory disease (fever ≥38ºC) with beginning within 7 long periods of close contact with a person who is an affirmed instance of swine flu.

A (H1N1) infection contamination, or within 7 long periods of travel to zones where there are at least one affirmed swine flu (H1N1) cases, or lives in a network where there are at least one affirmed swine flu cases, with or without short history of dyspnea, throat pain, cough. Cases were confirmed by throat swab positive for rapid influenza test or Enzyme linked immune sorbent assay (ELISA). All patients above 18years of age diagnosed with swine flu from November 2016 to July 2017 admitted at our center were enrolled in the study. All the lab examinations, complete hemogram, arterial blood gas (ABG) analysis, blood sugar, liver and renal function tests, chest X-ray, blood and endotracheal secretion culture results, which were done at the admission or time of affirmation or accordingly, were noted. The method of ventilation that is noninvasive or invasive mechanical ventilation parameters were recorded from the medical record sheets. Note was also made of organ dysfunctions, other than respiratory which resulted over the course of disease. The data was analyzed using appropriate statistical tools. The details of patients who were found to be positive for H1N1 influenza infection during the stipulated period of study were collected from the hospital records. Statistical analysis was done using SPSS version 22 software. Continuous variables were expressed as mean and categorical variables as counts and percentage Fischer's exact test was done to find out the correlation. P value less than 0.05 was statistically significant.

RESULTS

Total 30 confirmed swine flu (H1N1) cases were admitted at the hospital during that resurgence period. Out of 30 patients, predominantly were male patients that is 53.3%. The mean age of study participants was 48.8±17.7. The history of travel outside the local region or contact with infective patient was only 13.3%. 50 % of patients were smoker and 13.3% were alcoholic. Among the admitted patients 23 (76.6%) were discharged, 4 (13.3) patients expired and 3 left against medical advice. The main presenting symptom was fever that is 83.3%, followed by dyspnea (76.7%), cough (70%), throat pain and least common was chest pain (Table 1).

Table 1: Presenting symptoms of admitted swine flu patients.

Symptoms	N (%)
Fever	25 (83.3)
Throat pain	15 (50.0)
Cough	21 (70.0)
Dyspnea	23 (76.7)
Chest pain	4 (13.3)

The main co morbidity which was observed was diabetes followed by hypertension. 30% of patients were diabetic and 23.3% were hypertensive, 2 patients developed infection during pregnancy, one being with 25weeks and other being 36weeks of pregnancy.[1] Patient had an history of coronary artery disease, 2 were on treatment for hypothyroidism, 10 patients out of 30 during hospital stay underwent 2-D echocardiography (2-D Echo) on basis of chest X-ray finding (cardiomegaly, bilateral pleural effusion, pulmonary edema) and electrocardiography (ECG) abnormality.

Out of them, 5 patients had global hypokinesia of left ventricle with low ejection fraction. The co-morbidity was correlated with intensive care unit (ICU) admission and on applying Fischer's exact test presence of diabetes was significantly associated with admission in an ICU ($P<0.05$). There was a significant relationship of mortality with the presence of bilateral infiltrates on chest radiography ($P<0.04$).

The derangement of other lab parameters was also studied. 33.3% had derangement in renal function test followed by liver function test. Only one patient underwent hemodialysis rest all were managed conservatively. On comparing complete hemogram, hemoglobin of <9mg/dl were seen in 13.3% of patients, 60% of patients had normal total leukocyte count. On ABG analysis 23.3% had type 2 respiratory failure and 76.7% had type 1 respiratory failure (Table 2). The most common chest x ray finding was bilateral lung opacity seen in 53.3% (Table 3).

Rapid influenza test was positive in 33.3% of patients and all patients had ELISA positive test. Author further analyzed the treatment. The main stay of treatment initiated was oseltamivir administered in a dose range of 75mg twice daily for an average duration of 8.49days and 63.3% of patients received oseltamivir for more than 5days, vasopressor support was required in 23.3% cases, diuretics were given in 26.7% of patients.

Table 2: Laboratory parameters of patients diagnosed with swine flu.

Variable	N (%)
ABG Analysis	
Type 1 respiratory failure	23 (76.7)
Type 2 respiratory failure	7 (23.3)
Renal function test	
Deranged	10 (33.3)
Normal	20 (66.7)
Liver function test	
Deranged	3 (10.0)
Normal	27 (90.0)
Hemoglobin level	
<9	4 (13.3)
9-11	6 (20.0)
11-13	10 (33.3)
>13	10 (33.3)
Total leukocyte count	
Normal (4000-11000)	18 (60.0)
>11000	12 (40.0)
Platelets	
<150000	14 (46.6)
Normal (1.5-4.5)	16 (53.3)
Rapid influenza test	
Positive	10 (33.3)
Negative	20 (66.7)

Table 3: Radiological feature of patient diagnosed with swine flu.

Chest X-ray	N (%)
Normal	4(13.3)
B/L lung consolidation	6(20.0)
Left lung consolidation	1(3.3)
Right lung consolidation	3(10.7)
B/L lung opacity	16(53.3)

Around 86.7% were initiated on antibiotics primarily amoxicillin+clavulanic acid and azithromycin later revised as per culture report. 40% of patients received corticosteroid for an average of 6days, mostly given in patients with sepsis, septic shock, multi organ involvement. Corticosteroid doesn't help in reducing mortality. 60% patients required non-invasive ventilator support. 43.3% of patients required mechanical ventilation. Patients on invasive mechanical ventilation had received volume assist control mode of mechanical ventilation with low tidal volume (6ml/kg predicted body weight), 60% of patients were admitted in ICU and 40% were managed in ward from the day of admission. More the abnormality in ABG, more the admission in ICU ($p<0.05$) and 76.6% of patients were discharged, 3 patients left against medical advice and 4 (13.3%) of patients expired.

A multivariate model to identify independent predictors associated with mortality and ICU care in H1N1 influenza was done and it was found to be use of vasopressor, ABG at the time of admission, requirement of mechanical ventilation, number of organ failures. Use of corticosteroid is controversial.

DISCUSSION

This was a study of 30 patients confirmed cases of swine flu with age above 18years of age. Most of the studies done till present includes pediatric age group. The study comprised of male predominant patients that is 53.3%. Study conducted by Amaravathi KS et al, Mehta AA et al, Chudasama RK et al, Sardar JC et al, also found almost equal distribution of male and female among their confirmed cases.[7-10] Major presenting complaints were fever, dyspnea, cough, sore throat, which are also similar with the other studies.[10] Important co-morbidity was diabetes which also correlated with ICU stay as observed in study by Sardar JC et al, pregnancy has also been reported to be associated with mortality in previous epidemics (1918, 1957) though author had very few patients but patients survived and were discharged in stable condition.[10-13] Patients requiring noninvasive ventilator support were 60%, 43.3% of patients required mechanical ventilation as compared to study done by George HJ et al observed the same finding that patients if diagnosed early on basis of symptoms and started on treatment can be managed on noninvasive ventilator support.[14] On basis of radiological features bilateral lung infiltrates was observed to be most common as seen in study too done by George HJ et al. The use of steroids was not found to improve survival. However, they were used in patients who were already sick with a poor expected outcome, as has been the case in other studies.[15-17] There are some, studies which have indicated a relation between steroid use and mortality, and increased duration and load of viral shedding in previous pandemics.[18,19] Thus, it may be prudent to use steroids for conventional indications as recommended co-existent with H1N1 influenza, until we have further studies supporting its role in H1N1.[14,20]

CONCLUSION

To conclude, one might say that this study will encourage clinicians and general wellbeing authority to comprehend the clinico-epidemiological profile of swine influenza (H1N1) cases to analyze, treat and to create preventive techniques in future. The study of clinical profile and management of patients with swine flu at tertiary care hospital in Himalayan belt has not been done previously. This study had several limitations. Being a retrospective study, there was a selection bias and all the parameters and tests were assessed on clinical need and were not

standardized according to a protocol. Thus, data for some variables were not available for all the patients. Moreover, the sample size was small as selection was confined to patients sick enough to warrant hospitalization and above 18years of age were included in study.

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