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Original Research Article

Clinical Profile of H1N1 Influenza Patients in a Tertiary Hospital in South India

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Abstract

To study the clinical profile, course of H1N1 influenza cases hospitalized in a tertiary hospital in South India and to study the outcome in these hospitalized patients. A total of 26 cases were studied retrospectively during a period of 18 months from Jan 2016 to August 2017. Real –time reverse transcriptase –polymerase –chain reaction (RT-PCR) testing was used to confirm infection. The demographic, clinical and laboratory data of 26 (RT-PCR confirmed) H1N1 cases were collected and analysed using Fischer's exact test/paired t test between survivors and nonsurvivors to know their significance. This study was approved by the institutional research and ethics committee. A total of 26 confirmed cases were studied with maximum cases seen in the month of July. The mean age of the affected population was 46 years. Females (65.4%) were affected more than males (34.6%). Diabetes mellitus was the most common comorbid illness in our study. Fever, cough and breathlessness are the common presenting symptoms. 57.7% required ICU in our study. 23.1 % required vasopressors. Mechanical ventilation was required in 53.8% cases. The presence of thrombocytopenia (p = 0.025) use of vasopressors (p= 0.000), ICU admission (p- 0.017) and mechanical ventilation (p =0.010) were poor prognostic factors. Out of the 26 patients studied six patients died. The mortality in our study was 23.1%.

Keywords: H1N1 influenza, clinical profile, outcome.

1. Introduction

Swine flu is a disease of great concern but warrants no panic.[1] The clinical picture is different in different cases and critical care management of such patients imposes a great challenge to clinicians.[2] Recognizing the disease and early initiation of oseltamivir on clinical suspicion and patient isolation can help to reduce burden of disease on society. Swine flu is also called pig influenza, swine influenza, hog flu and pig flu. Swine influenza virus (SIV) is a strain of the influenza family of viruses that is endemic in pigs.[3] Ministry of health and family welfare[4], India has categorized the symptoms as Category A, B and C. Patients with mild symptoms like mild fever, sore throat, headache coryza are termed as Category A. No testing of the patient for influenza is required. These patients do not require antivirals but should confine themselves at home.

Category B includes in addition to the symptoms in category A, persistent high fever, severe sore throat or in addition having one or more high risk conditions shall be treated with Oseltamavir. They include children with mild illness but with predisposing factors, pregnant women, person aged 65 years or older, patients on long term steroids and patients with lung diseases, heart disease, diabetes, HIV, liver and kidney disorders. No tests for influenza are required for Category B. Category C includes patients who in addition to the above symptoms have breathlessness, chest pain, hypotension or children with severe disease with red flag signs and they require immediate hospitalization and treatment. The mainstay in treatment includes early identification of high risk factors. [5]

1.1 Aims and Objectives

The study was designed to study the clinical profile, and pattern of H1N1 patients admitted to our hospital and to study the distribution pattern and associated factors with treatment outcomes (survivors vs. Nonsurvivors)

2. Methodology

The present study had ethical clearance from institutional ethical and research committee. The present study is a retrospective study of successive, confirmed H1N1 patients admitted in a tertiary care centre from January 2016 to August 2017. All 26 cases were RT-PCR confirmed at virology laboratory, Manipal. The demographic, clinical and laboratory data were collected from medical records and analyzed. The ratio of PaO_2 /FiO_2 at the time of initiation of ventilatory support was noted in patients with lung involvement. ARDS was defined if the PaO_2/FiO_2 <200 and PaO_2/FiO_2 <300 were consistent with lung injury.

The statistical analysis was done for all parameters for outcome among survivors versus nonsurvivors. All cases were treated with oral Oseltamivir 75 mg bid, from the day of admission, in accordance with the WHO criteria. All the patients were treated with broad spectrum antibiotics to cover co-infection/secondary bacterial infections and inotropic support for shock and ventilatory support given according to patient requirement. Sputum and blood culture were done to rule out bacterial sepsis at admission and at regular intervals.

2.1 Statistical analysis

2.1.1 Descriptive statistics

Qualitative data like gender, co morbidities, normal and abnormal laboratory values, and outcome were analyzed and presented as frequency and percentages. Quantitative data like age, laboratory values, and duration of hospital stay are presented as mean and standard deviation with 95% confidence intervals.

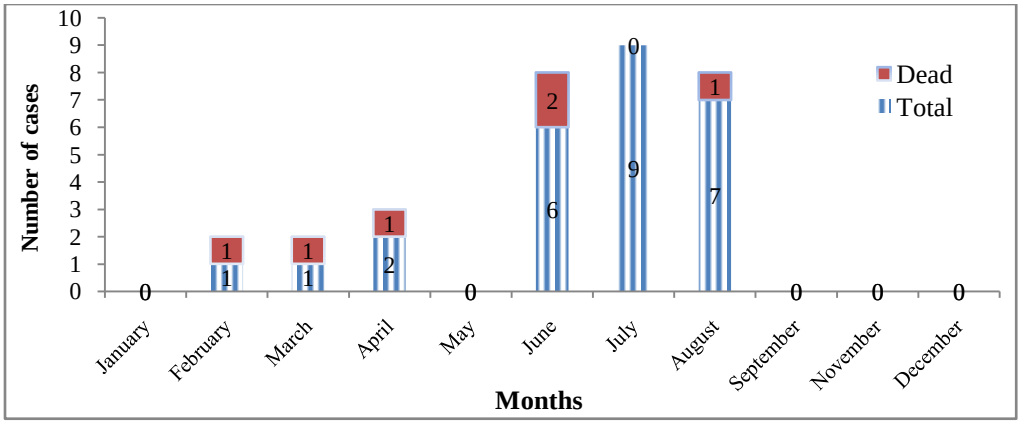
2.1.2 Analytical Statistics

To test association between clinical outcomes, laboratory values, hospital care management parameters the Independent 't' test was applied. Fischer's exact test was applied to test association between clinical outcomes and qualitative variables. The test was considered significant at $P < 0.05$.

3. Results

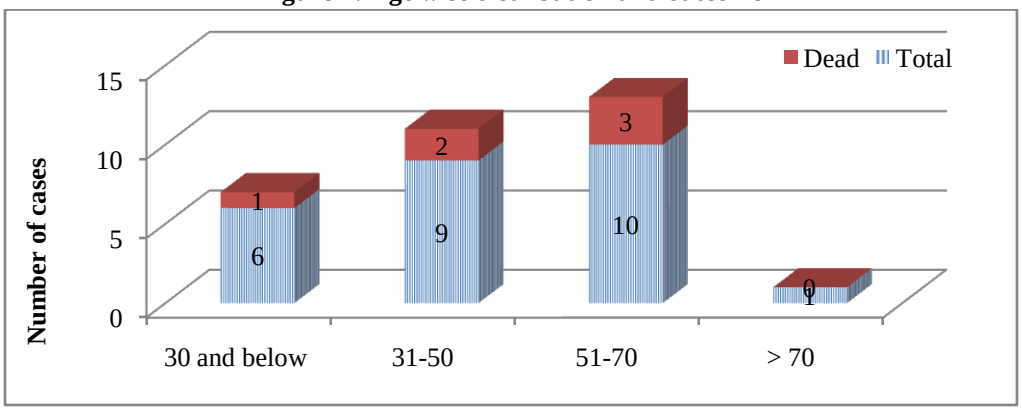
In our study the confirmed cases were seen mostly in the month June, July and August. The maximum number of cases was seen in the month of July as shown in Figure 1.

Figure 1: Month wise distribution



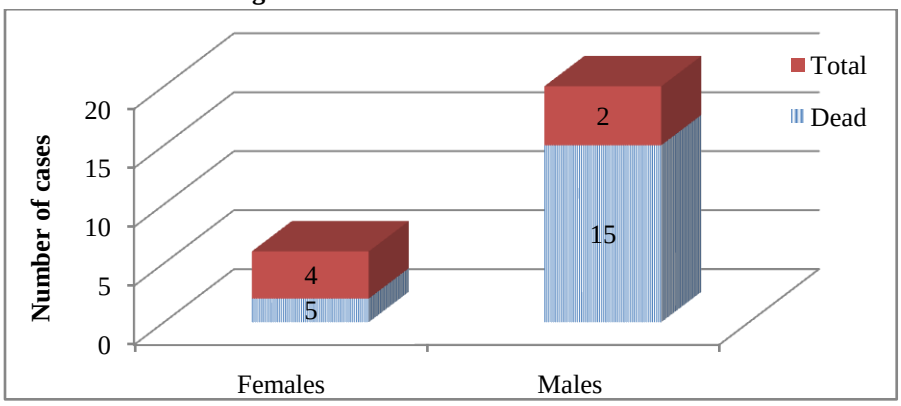
In our study the most common age group of affected people were between 51 to 70 years (38.5%) as shown in Figure 2.

Figure 2: Age wise distribution and outcome



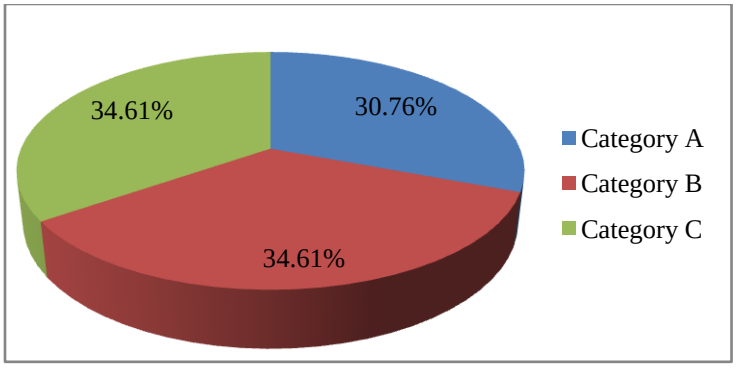
The mean age of affected population was 46 years. The mean age of mortality seen in our study was 51.33 years. Females (65.4%) were affected more than males (34.6%) as shown in Figure 3.

Figure 3: Sex distribution and outcome



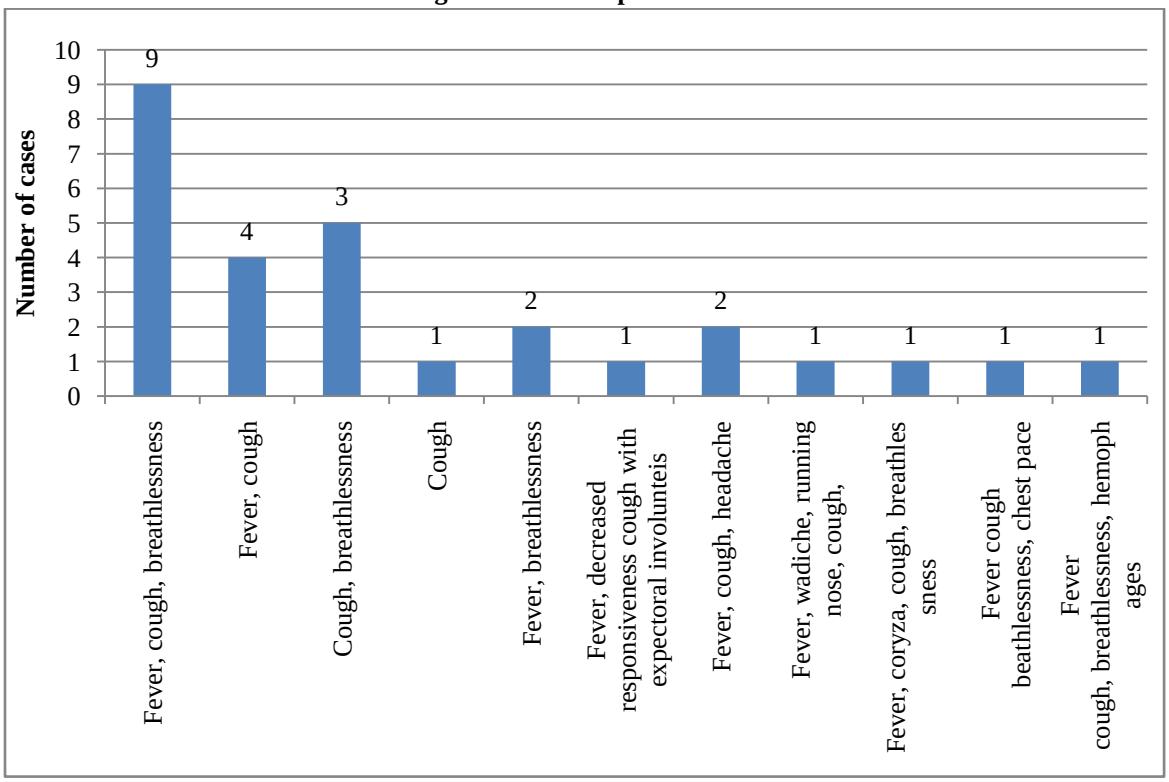
Most of the patients studied had category B (34.61%) and category C (34.6%) symptoms as shown in Figure 4.

Figure 4: Clinical features



In our study 38.5% had fever cough and breathlessness as presenting symptoms as shown in Figure 5.

Figure 5: Clinical presentation



In our study 34.6% had co morbid illness. The co existing conditions were diabetes mellitus, bronchial asthma, rheumatic heart disease and pulmonary tuberculosis and pregnancy as shown in Table 1.Diabetes mellitus was the most common preexisting illness in our study. There was no significant association between co existing conditions and outcome as shown in Table 2 .11.5% had also blood culture positive bacterial super infection. *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Acetinobacter* species were the isolated organisms in the blood culture. All patients in our study received antivirals. Tablet Oseltamivir 75 mg bid was received by all our patients. Lung involvement characterized by low PaO_2 /FiO_2 ratio when compared with survivors versus nonsurvivors did not show statistical significance. Thrombocytopenia was associated with poor prognosis (p value 0.025) as shown in Table 3. Renal involvement was not found to be statistically significant with respect to outcome.23.1% required vasopressors for hypotension. Use of vasopressors was associated with poor prognosis (p value-0.00)53.8% required ventilator support. Ventilator requirement was associated with poor prognosis in H1N1 patients (p value 0.010). 57.7% required ICU stay in our study. Mean ICU stay was 9.33 days. Intensive care unit stay was associated with poor prognosis (p value 0.017). The mean number of days on mechanical ventilation was 10 days. The overall mortality rate in our study was 23.1%.

Table 1: Patient Characteristics

		Count	Column N %
Age	30 and below	6	23.1%
	31 - 50	9	34.6%
	51 - 70	10	38.5%
	Above 70	1	3.8%
	Total	26	100.0%
Sex	1	17	65.4%
	2	9	34.6%
	Total	26	100.0%
Co-Morbidities	DM, HTN, BA	1	3.8%
	HTN, COPD	1	3.8%
	HTN, IHD	1	3.8%
	NIL	17	65.4%
	Pregnancy, Type 2 DM	1	3.8%
	Pregnant, Hypothyroidism	1	3.8%
	PTB, Type 2 DM	1	3.8%
	Rheumatic Heart Disease, Seizure Disorder	1	3.8%
	Sinusitis	1	3.8%
	Type 2 DM, HTN, ADS	1	3.8%
	Total	26	100.0%
Blood/Sputum Culture	No growth	23	88.5%
	Positive	3	11.5%
	Total	26	100.0%
Respiratory (PaO_2/FiO_2 Ratio)	>300	9	56.3%
	200-300	5	31.3%
	<200	2	12.5%
	Total	16	100.0%
Renal (Serum Creatinine)	<1.4	21	80.8%
	≥1.4	5	19.2%
	Total	26	100.0%
Hematologic (Platelet count)	> 1,00,000	23	88.5%
	0-20,000	2	7.7%
	< 20,000	1	3.8%
	Total	26	100.0%
Vasopressors	No	20	76.9%
	Yes	6	23.1%
	Total	26	100.0%
ICU	Yes	15	57.7%
	No	11	42.3%
	Total	26	100.0%
Ventilator	Yes	14	53.8%
	No	12	46.2%
	Total	26	100.0%
Outcome	Improved	20	76.9%
	Dead	6	23.1%
	Total	26	100.0%

Table 2: Patient Characteristics and Outcome

		Outcome					
		Improved			Dead		
		Count	Column N %	Row N %	Count	Column N %	Row N %
Age	30 and below	5	25.0%	83.3%	1	16.7%	16.7%
	31 – 50	7	35.0%	77.8%	2	33.3%	22.2%
	51 – 70	7	35.0%	70.0%	3	50.0%	30.0%
	Above 70	1	5.0%	100.0%	0	.0%	.0%
	Total	20	100.0%	76.9%	6	100.0%	23.1%
Sex	Female	15	75.0%	88.2%	2	33.3%	11.8%
	Male	5	25.0%	55.6%	4	66.7%	44.4%
	Total	20	100.0%	76.9%	6	100.0%	23.1%
Co-Morbidities	Nil	14	70.0%	82.4%	3	50.0%	17.6%
	Present	6	30.0%	66.7%	3	50.0%	33.3%
	Total	20	100.0%	76.9%	6	100.0%	23.1%
Blood/Sputum Culture	No growth	19	95.0%	82.6%	4	66.7%	17.4%
	Positive	1	5.0%	33.3%	2	33.3%	66.7%
	Total	20	100.0%	76.9%	6	100.0%	23.1%
Respiratory (PaO_2/FiO_2 Ratio)	>300	7	58.3%	77.8%	2	50.0%	22.2%
	200-300	4	33.3%	80.0%	1	25.0%	20.0%
	< 200	1	8.3%	50.0%	1	25.0%	50.0%
	Total	12	100.0%	75.0%	4	100.0%	25.0%
Renal (Serum Creatinine)	<1.4	17	85.0%	81.0%	4	66.7%	19.0%
	≥ 1.4	3	15.0%	60.0%	2	33.3%	40.0%
	Total	20	100.0%	76.9%	6	100.0%	23.1%
Hematologic (Platelet count)	> 1,00,000	19	95.0%	82.6%	4	66.7%	17.4%
	0-20,000	0	.0%	.0%	2	33.3%	100.0%
	< 20,000	1	5.0%	100.0%	0	.0%	.0%
	Total	20	100.0%	76.9%	6	100.0%	23.1%
Vasopressors	No	20	100.0%	100.0%	0	.0%	.0%
	Yes	0	.0%	.0%	6	100.0%	100.0%
	Total	20	100.0%	76.9%	6	100.0%	23.1%
ICU	Yes	9	45.0%	60.0%	6	100.0%	40.0%
	No	11	55.0%	100.0%	0	.0%	.0%
	Total	20	100.0%	76.9%	6	100.0%	23.1%
Ventilator	Yes	8	40.0%	57.1%	6	100.0%	42.9%
	No	12	60.0%	100.0%	0	.0%	.0%
	Total	20	100.0%	76.9%	6	100.0%	23.1%

Table 3: Significant Predictors of Outcome

	Chi square/Fishers exact test p	
Age	0.870	
Sex	0.060	
Co-Morbidities	0.366	
Co-Morbidities	0.209	
Blood/Sputum Culture	0.057	
Respiratory (PaO_2/FiO_2 Ratio)	0.680	
Renal (Serum Creatinine)	0.318	
Hematologic (Platelet count)	0.025	Significant
Vasopressors	0.000	Highly Significant
ICU	0.017	Significant
Ventilator	0.010	Significant

4. Discussion

The highest occurrence of H1N1 cases was in the month of July and the peak was seen in June – August duration. The peak of the epidemic is usually seen in June to August as per study by Jhung *et al*.[6] In our study because of the unseasonal rains we had the peak in July.

The majority age group in our study was in the range 51-70 years. The mean age group in our study was 46 years. It was consistent with study published by Lehners N and Geiss *et al*.[7] In the study by Lehners it was found that post pandemic season H1N1 influenza affected cases were mostly seen in the older population with the mean age group 40 years. . Our study had an overall mortality of

23.1% which is slightly higher compared to the studies conducted by Sharma K *et al*[8] (19%) probably because in our study most of the people affected were in the older age group with comorbid illness. The co-existing conditions were diabetes mellitus, hypertension, pulmonary tuberculosis, pregnancy, COPD, bronchial asthma, and rheumatic heart disease. Literature showed chronic respiratory condition, chronic liver disease, diabetes and pregnancy were among risk factors for H1N1 infection. However these risk factors were not associated with increased mortality in our present study. This findings correlated with those studies conducted by Puvanaligam *et al*.[9]

In our study thrombocytopenia was associated with poor prognosis and outcome .This finding correlated with the study done by Lopez-Delgado *et al*[10] where thrombocytopenia is a mortality risk factor in acute respiratory failure in H1N1 influenza .The use of vasopressors for ionotropic support, mechanical ventilation, ICU admission were the predictors of severe H1N1 infection according to Stuart R Dalziel *et al*.[11]

5. Conclusion

Clinicians should be vigilant for the potential of H1N1 infection to progress to severe acute respiratory distress syndrome in a variety of patient demographics. A high degree of suspicion is essential and prompt empiric antiviral therapy is essential. The mortality was higher in patients in the older age group. The presence of thrombocytopenia, use of vasopressors, ICU stay, use of mechanical ventilation are poor prognostic factors. Prompt treatment and management of complications by treating physicians, health education and identifying and isolating the cases plays an important role in curtailing the epidemic.

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Conflict of interest: None declared

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