

An Epidemiological Study of Swine Flue at Tertiary Care Centre in Bikaner Rajasthan

¹Dr. Parmendra Sirohi, ²Dr. Mahesh Kumar Barodia, ³Dr. Atmaram Chhimpa, ⁴Dr. Rakesh Kumar, ⁵Dr. Anubhav Dabas

¹Senior Professor, ^{2, 4-5} Resident Doctor, ³Assistant Professor

¹⁻⁵Department of General Medicine, Sardar Patel Medical College, Bikaner

Corresponding Author: Dr. Mahesh Kumar Barodia, Resident Doctor, Department of General Medicine, Sardar Patel Medical College, Bikaner

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Abstract

Background: Influenza A (H1N1), which is in post-pandemic phase and behaves like seasonal influenza, causes waves at regular frequency with resultant morbidity and mortality in susceptible population. Important clinical features of influenza include fever and upper respiratory symptoms such as cough, fever, and sore throat.

Methods: A hospital based prospective study was conducted in the department of medicine, S.P. Medical College & Associated Group of Hospitals, Bikaner.

Results: There was associated co-morbidity present in positive patients. The most common co-morbidity was COPD (25.9%) followed by Pulmonary TB (24.3%), Hypothyroidism (22.7%), Coronary Artery disease (12.7%) and other co-morbidities were constituent less than equal to 5%.

Conclusion: Our study showed high mortality and morbidity due to pandemic influenza A (H1N1) 2019 virus infections in Rajasthan, particularly in the younger and middle-aged population. Pregnancy, anaemia, heart and lung diseases were the common predisposing factors. Regular surveillance, early diagnosis and timely initiation of oseltamivir therapy in

suspected cases would be helpful to reduce mortality and morbidity under such emergency situation.

Keywords: Influenza, CAD, Hypothyroidism.

Introduction

In April 2009, a novel influenza A (H1N1) virus was determined to be the cause of influenza like illness in two children in the United States during March and April 2009 and the cause of respiratory illness in Mexico.¹ The virus quickly spread worldwide through human to human transmission. The first case in India was detected in May 2009 in a 23 yr old man who flew from New York to Hyderabad.² In humans three subtypes of influenza A viruses viz., H1N1, H2N2, and H3N2, resulting from genomic reassortment have been detected.³

Influenza A (H1N1), which is in post-pandemic phase and behaves like seasonal influenza, causes waves at regular frequency with resultant morbidity and mortality in susceptible population.⁴ Important clinical features of influenza include fever and upper respiratory symptoms such as cough, fever, and sore throat. Headache, body ache, running nose, fatigue, abdominal pain, diarrhea, and vomiting have also been observed.⁵ Usually reverse transcriptase polymerase chain reaction (RT-PCR) and throat swab culture are

done, which are time consuming and costly procedures and result in significant delay in confirmation of suspected cases and their isolation. There needs to be a rapid and cost-effective investigation to rapidly identify influenza A (H1N1) cases from seasonal flue so that patients can be rapidly isolated and further spread of virus can be prevented. Most of the research in influenza A (H1N1) is targeted toward characterizing Symptomatology and management aspect of the disease. There are very few studies that have tried to find out investigations that can be rapidly performed, cost effective, and can easily identify patient of influenza A from seasonal flue. The effectiveness of polymorphonuclear-to-lymphocyte ratio⁶ and lymphocyte-to-monocyte ratio⁷ as a cost-effective and rapid screening tool for suspected H1N1 cases have been proved in few studies.⁸ With these backgrounds, our primary objective is to review the effectiveness of polymorphonuclear-to-lymphocyte ratio as a tool to suspect or exclude H1N1 cases. Secondary objective of this study is to characterize the morbidity and mortality pattern of swine flu positive cases (Category C)⁹ admitted at tertiary hospital in Bikaner during the study period.

Material and method: A hospital based prospective study was conducted in the department of medicine, S.P. Medical College & Associated Group of Hospitals, Bikaner

Inclusion Criteria: Patients presenting with any two or more of the symptoms which include cough, sore throat, fever, rhinorrhea, malaise, headache, shortness of breath and chills.

Exclusion Criteria: All other patients who had productive cough indicating a bacterial infection or any symptoms other than those mentioned above or a positive chest X-ray indicating a lower respiratory tract

infection will be excluded. All data will be analyzed on EPI-info statistical software. Qualitative data will be expressed in the form of proportion.

Results: In our study we examined 2170 patients out of them 259 (11.9%) were diagnosed positive. Out of them 161 male and 98 female. The mean age of the patients were 48.8±11.7 years (Table: 1). The Mortality rate was 11.5% (30 patients were died).

Prevalence = (Number of cases of specific disease / Total number of cases at risk) X 100

$$= (259/2170) \times 100$$

$$= 11.9\%$$

Mortality rate= (Number of death / Total number of cases) X 100

$$= (30/259) \times 100$$

$$= 11.5\%$$

Table: 1 Sociodemographic Profile

Age	48.8±11.7
Male/Female	161/98
Rural/Urban	131/128

There was associated co-morbidity present in positive patients. The most common co-morbidity was COPD (25.9%) followed by Pulmonary TB (24.3%), Hypothyroidism (22.7%), Coronary Artery disease (12.7%) and other co-morbidities were constituent less than equal to 5%.

Table: 2 Associated Co-Morbidities

Co-Morbidities	Number	%
Pregnancy with severe Anaemia	3	1.1
Coronary Artery Disease	33	12.7
Hepatic Encephalopathy	14	5.4
Hypothyroidism	59	22.7
COPD	67	25.9
Pulmonary TB	63	24.3
DM	56	21.6
Pneumonitis	19	7.3

Discussion

The influenza A H1N1 emerged and spread over the world rapidly, becoming a global flu pandemic. The prevention, diagnosis, and treatment of the disease, especially for severely ill cases, will be of great importance for the future. This study has, for the first time in recent years, provided insight into the seroepidemiology of swine influenza in the Bikaner using a large sample set. During the epidemic periods in January-February 2019, there were 259 patients diagnosed with influenza A H1N1 infection in our hospital, including 30 severely ill patients and dies.

Here, prevalence of disease was 11.9% with mortality rate was 11.5% in the month of January-February, 2019. Malhotra et al¹⁰ also found a sudden increase in number of pandemic influenza A (H1N1) 2009 virus-positive cases in India in January 2015 and the infection became widespread. John et al found 34.11% percentage of positive cases and was higher than that reported in earlier studies, 22 per cent in India¹¹, 23.3 per cent in Mexico¹², 21.8 and 24.6 per cent in Rajasthan during 2012-2013^{13,14}, 32.93 per cent in Gujarat¹⁵. Death occurred in 378 cases and the CFR was six per cent in our study. No particular clinical or biochemical predictor was observed for mortality.

Here the mean age of the patients was 48.8±11.7 years with patients above 12 years. Malhotra et al¹⁰ Positivity and mortality were predominantly seen in 16-65 yr age group in the present study as has been earlier reported from India and other countries. People in this age group are mostly working and thus liable to get exposed to pandemic influenza A (H1N1) 2009 infection while those above 65 yr may have had greater immunity due to previous exposure to similar viruses.

In our study the disease was more prevalent in the month of January, 2019 which declined during

February, 2019. Malhotra et al¹⁰ also found that positivity started increasing from the first week of January, reached at the highest in the eighth week of 2015, with a decline subsequently. The relationship of influenza virus with low temperature has been reported from other States of India.

In our study nearly 30 patients (11.5%) were died having associated comorbidities. Here, the most common co-morbidity was COPD (25.9%) followed by Pulmonary TB (24.3%), Hypothyroidism (22.7%), Coronary Artery disease (12.7%) and other co-morbidities were constituent less than equal to 5%. In study by Malhotra et al¹⁰ Of the 323 deaths in the present study, 59.44 per cent had associated risk factors. A study from the USA reported co-morbidities in 73 per cent of fatal cases; asthma, diabetes, heart, lung, neurologic diseases and pregnancy; in addition, metabolic diseases, immunosuppressive conditions and neuromuscular disorders were reported from California. Heart and respiratory diseases along with anaemia, obesity and cancer were the common co-morbidities reported in Indian studies. High mortality was found in pregnant women in our study as reported earlier.

Conclusion

Our study showed high mortality and morbidity due to pandemic influenza A (H1N1) 2019 virus infections in Rajasthan, particularly in the younger and middle-aged population. Pregnancy, anaemia, heart and lung diseases were the common predisposing factors. Regular surveillance, early diagnosis and timely initiation of oseltamivir therapy in suspected cases would be helpful to reduce mortality and morbidity under such emergency situation.

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