

A Clinical and Epidemiological Study of H1N1 Cases at A Tertiary Care Hospital in Hyderabad, Telangana

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ABSTRACT

Introduction: Influenza A (H1N1) virus infection was first seen in Mexico and later spread quickly to United States and worldwide as a pandemic including India. During the H1N1 pandemic of 2009-2010, the number of hospital admissions and mortality rates were high in India as well as globally. The goal of this study was to analyse the clinical and epidemiological profile of Influenza A positive cases which were reported in the flu isolation unit in the hospital during the year 2015 and to examine the epidemiological trends of this disease.

Material and Methods: This was a hospital based study conducted in Gandhi Hospital of Gandhi Medical College which was a officially designated as swine flu nodal centre since 2009. Children with influenza like illness of category B and C were hospitalised and samples sent to IPM for confirmation. Patient data was collected from the swine flu nodal center register and entered it into excel sheet.

Results: Males were more frequently affected (61%) than females (39%). Majority of the children affected with swine flu belonged to the under-five age group (84.5%) and 6-15 years children accounted for only 15.5% of the swine flu cases. Fever, cough and cold (100%) were the most common clinical manifestations followed by S.O.B (25.55%), diarrhoea (11.11%), sore throat (3.33%) and convulsions (2.22%). Majority of the patients belonged to category C (55.56%) followed by category B (44.44%). Peak admissions were in the month of February (36.84%). The mortality rate was very low.

Conclusion: This study has shown that the prevalence of Influenza A (H1N1) is high in the under-five children. Fever, cough and cold are the most common presenting symptoms. Though the study was mainly from a nodal hospital, the information collected was for only a limited period. A longer time study is required to understand the seasonal variation of the Influenza virus.

Keywords: H1N1 influenza, fever, cough

INTRODUCTION

In children, Influenza is one of the common infections that has high morbidity and mortality.^{1,4} During spring of 2009 a novel influenza A (H1N1) virus caused acute respiratory illness in Mexico and then spread globally resulting in an H1N1 influenza pandemic. This virus has lead to increased mortality and morbidity globally. In contrast to seasonal influenza, it had mostly affected children and young and healthy people accounting for 90% of deaths, which were some of the uncharacteristic features of H1N1 infection.^{5,6} There were several influenza pandemics since 1900 and each time, due to major genetic changes, new strains of the virus have evolved. The reason for the spread could be urbanization, overcrowding, environmental warming and international travel. This has happened despite the fact that modern medical developments like better vaccines and medicines and improved public health strategies.⁷⁻¹⁰

The first confirmed case in India of influenza A (H1N1) was recorded in Hyderabad on May16, 2009. Later other cities like Mumbai, Bangalore and Chennai also reported. The total number of laboratory confirmed cases was 45,101 and deaths were 2679 by October 2010.²

Influenza virus causes acute respiratory illness which is usually seasonal. Outbreaks occur during winter and also during monsoon season. In healthy children the course is usually self limited, but needing medical attention thus causing financial burden on families. Only few studies regarding Influenza epidemiology are present in India. This study aimed to determine the clinical and epidemiologic profile and to study the morbidity/mortality pattern in cases found positive for Influenza A H1N1 at the Gandhi Medical College Gandhi Hospital, Secunderabad.

MATERIAL AND METHODS

It was a hospital based study conducted in Gandhi Hospital, Gandhi Medical College after due permission from the Institutional ethical committee.

We adopted the standard international definition of a case as H1N1 Influenza confirmed "as a patient who is positive in a real time reverse transcriptase polymerase chain reaction (RT-PCR) test as confirmed in a laboratory".^{1,2} A total of 318 ILI cases were admitted during the period from January 2015 to April 2015 and out of this 90 cases were confirmed positive for H1N1 by the Institute for Preventive Medicine Laboratory at Narayanguda, Hyderabad.

Internationally, a standard categorisation of H1N1 of symptoms is used. The Union Ministry of Health and Family Welfare, Government of India, has issued such guidelines for the country. These categories are three in number, are used by most doctors in their research publications. Our study has also used the same guidelines and all admitted patients were placed in one or more of these three categories, which are shown below:

In Category B, the following high risk conditions are also included: children under five years of age, pregnant women, persons above 65 years, those with existing lung disease, heart disease, kidney disease, blood disorder, diabetes, neurological disorders, cancer, HIV/AIDS and those on long term steroid

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therapy.

STATISTICAL ANALYSIS

The data for analysis was devoid of any personal patient information and was simply a statistical analysis of recorded historical and clinical information. Standard statistical measure like frequency distribution and charts from Excel were created from the data.

RESULTS

Table-1 shows that males were more frequently affected (61%) than females (39%).

From Table-2, it can be seen that about 84.5% of the children affected with swine flu belonged to the under five age group and 6-15 years children accounted for only 15.5% of the swine flu cases (P value).

Table-3 shows that fever, cough and cold (100%) were the most common clinical manifestations followed by S.O.B (25.55%), diarrhoea and vomiting (11.11%), sore throat (3.33%) and convulsions (2.22%).

Table-4 gives the monthly admissions of patients and of them the number of H1N1 confirmed cases.

In Figure-1, the month wise distribution of H1N1 cases is shown. The cases gradually escalated reaching a peak during February month, there after showing a steady decline by April 2015.

DISCUSSION

The highest occurrence of H1N1 cases was in the month of February (33%) while the number of positive cases significantly reduced by April. In a study conducted by Mahender Singh et al. from Rajasthan (September 2012-March 2013)³, similar results were reported. In that study, the largest proportion of patients (33.2%) was admitted in the month of January. Other research studies on H1N1 reported that the usual peak of H1N1 epidemic is between September and December.¹²⁻¹⁶ In our study, the peak was in the month of February, probably because of severe winter and unseasonal rain during that year. Inadequate hygiene and crowded urban infrastructure could have added to the problem. In addition, our study was restricted only to data of four months and not for the entire year.

The cases were more in the under-five age group. These findings are similar to a study conducted by Allen C Cheng et al⁴ and Pankaj Kumar Mandal et al.⁵ Different studies conducted by Guadalupe Ayora-Talavera¹² et al, M. Fabbiani et al, Sabra L Klein¹⁷ et al and Xiao H⁶ et al also showed that young individuals were mostly affected. This study is conducted in paediatric hospital hence only paediatric population data is available. The reason for higher proportion among under-five children might be that these age groups are in the high risk group.

In the present study, males were more frequently affected (61%) than females (39%). A the study conducted by Pankaj Kumar Mandal et al⁵, 71.8% of the cases of influenza (H1N1) which were confirmed were in males. In studies conducted by Xiao H et al and Ling LM et al⁶, higher number of cases effected were males than females. This is consistent with the results of our study. However, other studies by other international researchers (van't Klooster TM et al⁷, Fielding J et al⁸ and Tulloch F et al⁹) reported that rates of hospitalization were higher among females than males. In the studies conducted by

Sex	No. of Subjects	Percentages
Male	55	61%
Female	35	39%

Table-1: Sex Distribution of Study Subjects

Age Group in years	Number of Subjects	Percentages
< 1	20	22.22%
1-5	56	62.22%
6-10	10	11.11%
11-15	4	4.44%

Table-2: Age Distribution of Study Subjects

Symptoms	Frequency	Percentages
Cold	90	100.00%
Convulsion	2	2.22%
Cough	90	100.00%
Diarrhoea	10	11.11%
Fever	90	100.00%
SOB	23	25.55%
Sore throat	3	3.33%
Vomitings	10	11.11%
Total	90	100.00%

Table-3: Clinical Manifestation

Month	Admissions	H1N1 +
January	96	31
February	98	32
March	116	23
April	8	4
Total	318	90

Table-4: Monthly admissions of patients and the number of H1N1

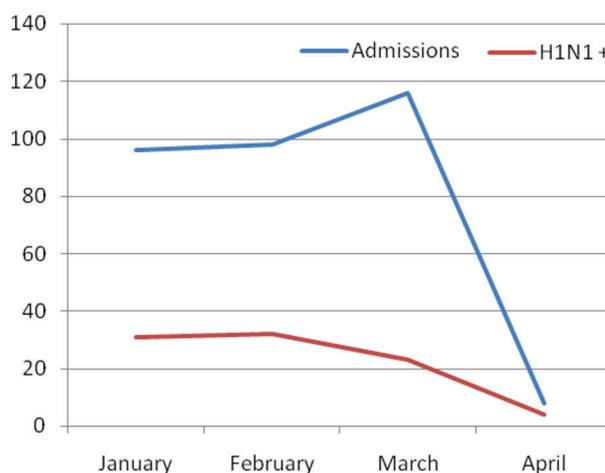


Figure-1: Line Diagram showing monthly trend of H1N1 cases

Chudasama et al.¹⁰ (M: F = 1:1), and Puvanalingam et al.¹¹ (M: F = 1:1.25) from Gujarat, and Tamil Nadu, respectively, there was no significant difference between males and females. This difference could be accounted by the reason that in India, there seems to be a difference between medical treatment sought by parents for male versus female children and parents could bring male children quicker to the hospital when they fall sick. Fever, cough and cold (100%) were the most common clinical manifestations in our study subjects followed by S.O.B (25.55%), diarrhoea and vomiting (11.11%), sore throat (3.33%)

and convulsions (2.22%). The study conducted by Pankaj Kumar Mandal et al⁵ reveals that fever, cough and sore throat were the most common clinical manifestations in confirmed cases of H1N1 influenza. Similar findings are seen in studies conducted by Allen C Cheng et al⁴, van't Klooster TM et al⁷ and Tulloch F et al.⁹ Similarly, Talavera et al¹² in Southern Mexico, Cao B¹³ in China, Chudasama et al¹⁰ in Saurashtra, India and Seema Jain et al¹⁴ in United States reported that fever, cough and headache were the predominant clinical manifestations. Diarrhoea (11.11%) and sore throat (3.33%) were the less common manifestations revealed in our study. Cao B et al in China reported that only 2.8% patients had diarrhoea. In a study of Chinese H1N1 patients conducted by Ling LM et al¹⁵, fever (81%) was the predominant symptom, while cough (40%) and sore throat (35%) were almost equally the second predominant symptoms. Van't Klooster TM et al⁷ analysed the data of the first 100 patients reported with H1N1 influenza in Saudi Arabia. They reported cough (54%) and sore throat (32%) as the predominant symptoms followed by rhinitis (17%) and difficulty in breathing (7%). In a study conducted at Chile by Fielding J et al⁸, fever (83%) and cough (72%) were the leading symptoms while odynophagia (54%) and myalgia (48%) were also significant. Similarly, a study done by Tulloch F et al⁹ in Japan revealed that fever (87%) and cough (86.3%) were the predominant symptoms and sore throat (65%) was next.

Limitations

This is a hospital based study undertaken in a paediatric hospital hence information regarding only the paediatric age group is available and the sample size is limited. However the findings are quite consistent with those of other larger studies in India as well as in other countries.¹⁷⁻¹⁹

CONCLUSION

During the present epidemic study at our hospital the incidence was higher in under-five children with maximum positive cases occurring in February. Meticulous screening at the community level, prompt treatment and management of the complications and other preventive measures go a long way in curtailing the recurrence of this epidemic. At the public health level continuous surveillance for any resurgence of the infection causing further epidemics/pandemics to be done.

Our study is a limited small sample study. It provided epidemiological information on the H1N1 cases confirmed among patients admitted to our tertiary care hospital. However, larger studies involving multiple hospitals as well as data collected from community-based health sector organizations are needed to understand the medical and Government responses to H1N1 Influenza A. The study highlighted the common as well as less common clinical manifestations of H1N1 influenza cases, males and Under five children were mostly affected which would be helpful to the clinician for early diagnosis and management.

REFERENCES

- World Health Organization. Acute Respiratory Infections: Influenza.
- Ministry of Health and Family Welfare, Government of India. Consolidated status of Influenza A H1N1 Available from: [http://mohfwh1n1.nic.in/documents/PDF/SituationalUpdatesArchives/](http://mohfwh1n1.nic.in/documents/PDF/SituationalUpdatesArchives/December/31.10.2010.pdf) December/31.10.2010.pdf,
- accessed on 25th November, 2012.
- Singh M, Sharma S. An epidemiological study of recent outbreak of In-fluenza A H1N1 (Swine Flu) in Western Rajasthan region of India. *J Med Allied Sci.* 2013;3:48-52.
- Allen C Cheng, Tom Kotsimbos, Anna Reynolds, Simon D Bowler, Simon G A Brown, Robert J Hancox, et al; Clinical and epidemiological profile of patients with severe H1N1/09 pandemic influenza in Australia and New Zealand: an observational cohort study; 2015;8:267-271.
- Pankaj Kumar Mandal, Jadab Chandra Sardar, Biswanath Bhandari. Clinical profile of H1N1 Influenza: A hospital based epidemiological study in Kolkata, India"; *Sudanese Journal of Public Health*; 2013;8:21-24.
- Xiao H, Lu SH, Ou Q, Chen YY, Huang SP. Hospitalized patients with novel influenza A (H1N1) virus infection: Shanghai, June – July 2009. *Chin Med J (Engl).* 2010; 123:401-405.
- Van't Klooster TM, Wielders CC, Donker T, Isken L, Meijer A, van den Wijngaard CC, van der Sande MA, van der Hoek W. Surveillance of hospitalisations for 2009 pandemic influenza A (H1N1) in the Netherlands, 5 June – 31 December 2009. *Euro Surveill.* 2010;15:19461.
- Fielding J, Higgins N, Gregory J, Grant K, Catton M, Bergeri I, Lester R, Kelly H. Pandemic H1N1 influenza surveillance in Victoria, Australia, April - September, 2009. *Euro Surveillance.* 2009;14:19368.
- Tulloch F, Correa R, Guerrero G, Samaniego R, Garcia M, Pascale JM, Martinez A, Mendoza Y, Victoria G, de Lee MN, Marchena L, de Mosca IB, Armien B. Influenza Research Group: Profile of the first cases hospitalized due to influenza A (H1N1) in Panama City, Panama. May-June 2009. *J Infect Dev Ctries.* 2009;3:811-816.
- Chudasama RK, Patel UV, Verma PB, Amin CD, Savaria D, Ninama R, et al. Clinico-epidemiological features of the hospitalized patients with 2009 pandemic influenza A (H1N1) virus infection in Saurashtra region, India (September, 2009 to February, 2010). *Lung India.* 2011; 28:11-6.
- Puvanalingam A, Rajendiran C, Sivasubramanian K, Ragunathanan S, Suresh S, Gopalakrishnan S. Case series study of the clinical profile of H1N1 swine flu influenza. *J Assoc Physicians India.* 2011;59:14-16,18.
- Guadalupe Ayora-Talavera, Miguel Betancourt- Cravioto, Jesús Gómez-Carballo, Laura Conde-Ferráez, Refugio González-Losa, Pablo Manrique-Saide, E. Cuauhtémoc Sánchez, Álvaro Quijano-Vivas. Epidemiologic study of human influenza A (H1N1) virus in Yucatan, Southern Mexico. *Rev Biomed.* 2012;23:39-46.
- B Cao, XW Li, Y Mao, J Wang, HZ Lu. Clinical features of the initial cases of 2009 pandemic influenza A (H1N1) virus infection in China, England *Journal of Medicine,* 2009 - Mass Medical Society
- S Jain, L Kamimoto, AM Bramley. Hospitalized patients with 2009 H1N1 influenza in the United States, April–June 2009 *England Journal of Medicine,* 2009 - Mass Medical Society
- LM Ling, AL Chow, DC Lye, AS Tan. Effects of early oseltamivir therapy on viral shedding in 2009 pandemic influenza A (H1N1) virus infection. *Clin Infect Dis.* 2010;50:963-9
- M. Fabbiani, S. Di Giambenedetto, M. Sali, S. Farina, V. Di Cristo, A. De Luca, G. Pignataro, M. Proserpi, A. Di Franco, N. Gentiloni Silveri, G. Delogu, R. Cauda, G. Fadda and. S. Manzara. Clinical presentation, microbiological features and correlates of disease severity

- of 2009 pandemic influenza A (H1N1) infection. *European Journal of Clinical Microbiology and Infectious Diseases*. 2011;30:541–549.
17. Sabra L Klein, Catherine Passaretti, Martha Anker, Peju Olukoya and Andrew Pekosz. The impact of sex, gender and pregnancy on 2009 H1N1 disease. *Biol Sex Differ*. 2010;1:5.
 18. Hubmayr, Rolf D. and Farmer, J. Christopher. Should We “Rescue” Patients With 2009 Influenza A(H1N1) and Lung Injury From Conventional Mechanical Ventilation? *Chest*. 2010;137:745-747.
 19. Joon Hyung Kim, Hyo-Soon Yoo, Joo-Sun Lee, Eun Gyu Lee, Hye-Kyung Park, Yeon Hee Sung, SeongSun Kim, Hyun Su Kim, Soo Youn Shin and Jong-Koo Lee. The Spread of Pandemic H1N1 2009 by Age and Region and the Comparison among Monitoring Tools. *J Korean Med Sci*. 2010;25:1109-1112.

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