PROFILE OF PATIENTS IN H1N1 OUTBREAK IN 2015 IN A TERTIARY CARE HOSPITAL IN INDIA

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ABSTRACT

BACKGROUND

Influenza viruses circulate in human populations causing epidemics on an annual basis. Pandemics may occur with the formation of new strains. This study describes the profile of patients suffering from H1N1 influenza presenting to a tertiary care hospital, during the 2015 epidemic. Information regarding the sex distribution, age distribution, common clinical features (along with their duration), comorbid conditions and outcome has been analysed. Data regarding the distribution, associated factors and variations observed in relation to the 2009 pandemic would help in easier identification and supervision of cases in the future.

MATERIALS AND METHODS

The study was conducted in a tertiary care government hospital in Bangalore, attached to a medical college. Data regarding the common clinical features, the underlying medical condition and the treatment outcome of the patients who presented to the outpatient department, was analysed. A total of 105 suspects were screened from January 2015 to April 2015 and confirmation done by the Polymerase Chain Reaction.

RESULTS

During the study period, a total of 105 patients were tested for H1N1 of which 37 (35.24%) were positive and most of them were from urban areas in Bangalore. The main presenting features were fever and diarrhoea. All patients were admitted to the ICU, given ventilator support, and treated with Oseltamivir and broad spectrum antibiotics. Average number of days of stay in ICU was 3.73 days per patient. 19 (51.36%) of the patients died.

CONCLUSION

Unexpected outbreak of such a severity was successfully managed in a tertiary care, public sector hospital due to effective infection control policies and lessons learnt from the 2009 pandemic.

KEYWORDS

H1NI, Complications

BACKGROUND

H1N1 influenza, popularly known as "Swine Flu" is caused by a subtype of Influenza A viruses. Influenza viruses circulate in human populations causing epidemics on an annual basis. Occasionally, an antigenically new strain may arise, which could cause a pandemic.[1] H1N1 was one such new strain, resulting from a reassortment between 4 viruses–2 genes were from influenza viruses in pigs, and the last 2 were from bird and human influenza viruses.[2] The first case H1N1 influenza was reported in Mexico in March 2009. It spread to over 214 countries worldwide.[3] with the WHO raising the pandemic alert to phase 6 by June 2009.[4] As of December 2009, the pandemic strain caused 967 deaths in 26,039 people who were diagnosed with the disease. A notable feature of this outbreak was the high morbidity and mortality observed in the younger age groups.[5]

Early in the year 2012, a re-emergence was noted. [6] As of March 2015, nearly 2035 people in India have died due to H1N1 influenza while the total number diagnosed stands at 33,761. In the State of Karnataka, nearly 2733 cases have been diagnosed with 82 people dying as a result of the flu.[7]

Fever and cough are considered to be two of the hallmark symptoms of the disease along with breathlessness, fatigue, chills and myalgia. The symptoms are comparable to that of seasonal flu, with the exception of gastroenterological symptoms, such as vomiting and diarrhoea, which are more commonly associated with H1N1.[8] It most usually presents as mild or subclinical pneumonia, but some cases present as severe community acquired pneumonia. It can further progress to acute lung injury/acute respiratory distress syndrome. In some situations, primary viral pneumonia with secondary bacterial infections may occur (20-30%).[9] The existence of underlying medical conditions (Pregnancy, chronic lung conditions) imposes a greater risk of complications and death associated with H1N1.[9] Healthcare personnel are at increased risk of occupational exposure to the 2009 H1N1 virus, based on their likelihood of encountering patients with this illness.[10]

This study aims at analysing the profile of patients suffering from H1N1 influenza by accumulating information regarding the sex distribution, age distribution, common

clinical features (along with their duration), comorbid conditions and outcome. Information regarding the distribution, associated factors and variations observed in relation to the 2009 pandemic would help in easier identification and supervision of cases in the future.

MATERIALS AND METHODS

The study was conducted in a tertiary care government hospital in Bangalore attached to a medical college. After obtaining permission from the superintendent of the institution, the information regarding the common clinical features, the underlying medical condition and the treatment outcome of the patients who presented to the outpatient department, was analysed. A total of 105 suspects were screened from January 2015 to April 2015. The throat and nasal swabs were collected in viral transport media and were sent to a government designated referral laboratory for testing and confirmation by the Polymerase Chain Reaction.

The patients who presented with flu-like symptoms were categorised into category A (patients with mild fever plus cough/sore throat with or without body ache, headache, diarrhoea and vomiting), category B (in addition to the signs and symptoms of category A), if the patient had high grade fever and severe sore throat or if the patient had one or more of the following high-risk conditions, like children who were less than 5 years old, pregnant women, persons who were aged 65 years or older, patients with lung diseases, heart disease, liver disease, kidney disease, blood disorders, diabetes, neurological disorders, cancer and HIV/AIDS and patients on long-term cortisone therapy and category C (in addition to the above signs and symptoms of categories A and B, if the patient had breathlessness, chest pain, drowsiness, fall in blood pressure, worsening of the underlying chronic conditions and among the small children, irritability, refusal to accept feeds).[11]

RESULTS

During the study period, a total of 105 patients were tested for H1N1 of which 37 (35.24%) were positive, 16 male and 21 females. The age distribution of the patients is represented in Figure 1. Maximum numbers of cases were in the age groups of 30-39 years (8) and 40-49 years.[8]

The main presenting features were fever seen in 25 (67.6%) patients and diarrhoea seen in 24 (64.87%) of the patients who tested positive for H1N1. The distribution of presenting features is given in Figure 2. Most of the patients presented to the hospital with complaints of duration greater than 6 days. The distribution of duration of complaints is given in Figure 3. All of the cases were from Bangalore city, with the exception of one case from a rural area.

All patients were admitted to the ICU, given ventilator support, and treated with Oseltamivir and Broad Spectrum antibiotics. Average number of days of stay in ICU was 3.73 days per patient. 19 (51.36%) of the patients died, 11 of bronchopneumonia and 8 of ARDS. 10 (27.03%) patients who tested positive for H1N1 had associated comorbid conditions (Pregnancy, diabetes mellitus and hypertension).

DISCUSSION

With the fall of the global pandemic in 2010, there have been multiple outbreaks of H1N1 influenza in India in the intervening years.

The present resurgence of pandemic virus cannot be attributed to any single factor at this stage. In our study, a greater number of females were diagnosed positive as compared to males. This was in contrast to a study in Delhi in which males were predominantly affected.[12]

However, despite variations in incidence and severity following infection in males and females, the outcome of infection with 2009 H1N1 was generally worse for females, with variations across different communities.[13-15]

The Skewed Sex Distribution can be Related to Several Factors such as

1. **Occupational Risk**: Healthcare personnel, are at a higher risk of exposure to influenza viruses than the general public. Women are a significant part of this group putting them at a greater risk for contact with influenza. [11]

2. **Personal Hygiene:** One of the primary modes of transmission of influenza is through droplet aerosols, via contact. As a results hand washing forms one of the mainstays of preventing transmission, and this practice is significantly better among females.[16]

3. **Health Care:** While some studies report that women are more likely to seek medical advice, the quality of care received by them is often inferior compared to that of men, in parts of the world.[17]

4. **Comorbid Conditions:** Chronic medical conditions predispose patients to increased influenza-related morbidity.[18] This refers to the dissimilarities in incidence of respiratory, hepatic, cardiovascular, metabolic and immunodeficiency diseases between males and females.

5. **Hormones:** Sex hormones vary in their action on the immune system. This may contribute to the variation in sex distribution and the effects of pregnancy in cases of H1N1.

6. **Vaccination:** Trials involving the influenza vaccines have shown sex based variations in the rates of vaccination, antibody responses to the vaccines and adverse reactions to the vaccines.[19]

In this study of the 37 patients with H1N1, only 5 (13.5%) required ICU admission. This was similar to the findings of Ramakrishna et al in which 22.8% of the patients required ICU treatment.[20]

This is significantly more than a study from Mexico in which 5.6% were admitted to the ICU.[21] but comparatively less than the figures from Australia, in which 26.8% were admitted to the ICU.[22]

In our study, most of the patients were in the age group of 30-49 years. However, most studies indicate the greatest disease burden for the 2009 epidemic in younger individuals (less than 25 years).[3, 23-25]

It is also in contrast to peak periods of seasonal influenza, which is more common among people older than 65 years and those under the age of 5 years.[26]

This may be due to the fact that older people have pre-existing immunity to the H1N1 virus as determined by serological and epidemiological studies.[8] In our study, the primary complaints were found to be fever, breathlessness and cough and the other symptoms were sore throat,

J. Evolution Med. Dent. Sci./ eISSN- 2278-4802, pISSN- 2278-4748/ Vol. 5/ Issue 78/ Sept. 29, 2016

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headache, myalgia, lethargy/drowsiness, rhinorrhoea and chest pain.

This is in concordance with several studies, which have stated fever and respiratory symptoms to be characteristic of this condition.[6,27-30]

All of the patients had complaints of gastrointestinal symptoms such as pain abdomen, vomiting or diarrhoea. This is in contrast to a study by Tambe et al in which patients reported such complaints in addition to the others listed.[24]

Our study revealed that most of the patients sought medical help after more than 6 days of symptom presentation. This was in concordance with the report by Barclay, which suggested a relatively long period of illness prior to presentation to the hospital.[28]

However, a study by Basha et al revealed that most of the patients presented after two days of symptoms.[29]

A review of literature by Anand et al concluded that the prognosis of the disease was best when treatment started as early as 48 hours after appearance of symptoms.[30]

CONCLUSION
Compared to the 2009 pandemic, 2015 outbreak was more severe and had more morbidity. The healthcare personnel were more aware and better equipped to handle a sudden resurgence. This influenza outbreak affected young people without comorbid conditions, which indicate no prior immunity in the affected population.
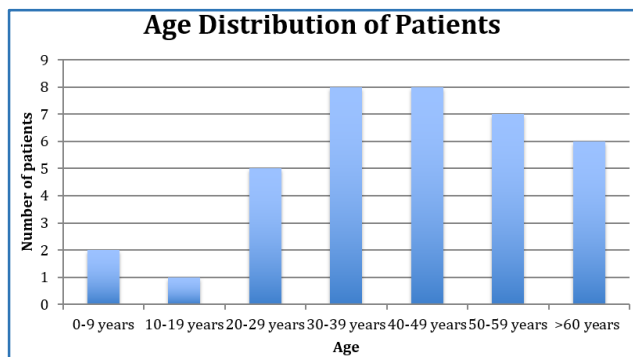
Fig.1

Presenting Feature	Number of Patients
Fever	25
Diarrhoea	24
Breathlessness	18
Cough	12
Sore Throat	7
Headache	5
Myalgia	4
Drowsiness/Lethargy	2
Expectoration	2
Rhinorrhoea	1
Chest pain	1
Table 1	

Duration of Complaints (in days)	Number of Patients
1-2 days	4
3-4 days	8
5-6 days	11
>6 days	14
Table 2	

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J. Evolution Med. Dent. Sci./ eISSN- 2278-4802, pISSN- 2278-4748/ Vol. 5/ Issue 78/ Sept. 29, 2016

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