INTRODUCTION

The WHO, on March 11, 2019, launched the Global Influenza Strategy for 2019–2030, aimed at protecting people from influenza. Worldwide, its annual epidemics have resulted in about 3–5 million cases of severe illness and lakhs of respiratory deaths. Punjab has shown a lot of fluctuation in the reported number of H1N1 cases and deaths annually. Aim and Objectives: The objectives of this study were to study descriptive epidemiology of H1N1 in year 2018. Methodology: Data were procured from the Directorate of Health and Family Welfare, Punjab and were analyzed. Results: Forty-seven cases of H1N1 were reported. The attack rate was 1.55/Lakh population. Higher percentage of cases, 61.7%, was found in urban than in rural areas. The mean age of H1N1 cases was 46.09 ± 16.36 years. A maximum number of cases, 42.6%, were in >50 years, followed by 25.5% in 40–50 years. Sex-wise difference in number of males and females was insignificant. The number of cases was maximum in December and minimum in April. A higher number of cases was found in private hospitals. Discussion: AR of H1N1 cases in 2018 in Punjab remained less than in other studies conducted in Punjab and some parts of India. It showed variations in different months of the same year. Conclusion: Keeping in view the occurrence of higher number of cases from December to April, more emphasis should be laid on prevention and control measures in these months.

Key words: AR, H1N1, integrated disease surveillance programme, influenza-like illness, respiratory illness, real-time-polymerase chain reaction assay, swine flu

INTRODUCTION

The WHO, on March 11, 2019, launched the Global Influenza Strategy for 2019–2030, aimed at protecting people in all countries from the threat of influenza. The strategy meets one of the WHO’s mandates to improve core capacities for public health and increase global preparedness and was developed through a consultative process with input from the Member States, academia, civil society, industry, and internal and external experts. The goal of the strategy is to prevent seasonal influenza, control the spread of influenza from animals to humans, and prepare for the next influenza pandemic. It provides a framework for the WHO, countries, and partners to approach influenza holistically – from surveillance to disease prevention and control – with the goal of strengthening seasonal prevention and control and preparedness for future pandemics.\textsuperscript{[1]}

Worldwide, these annual epidemics are estimated to result in about 3–5 million cases of severe illness, and about 290,000–650,000 respiratory deaths. In industrialized countries, most deaths associated with influenza occur among people age 65 or older.\textsuperscript{[2]}

There are four types of seasonal influenza viruses, types A, B, C, and D. Influenza A and B viruses circulate and cause seasonal epidemics of disease. Influenza A viruses are further classified into subtypes according to the combinations of the hemagglutinin and the neuraminidase, the proteins on the surface of the virus. At present, circulating in humans are subtype A (H1N1) and A (H3N2) influenza viruses. The A (H1N1) is also written as A (H1N1) pdm09 as it caused the pandemic in 2009 and subsequently replaced the seasonal influenza A (H1N1) virus which had circulated before 2009. Only influenza type A viruses are known to have caused pandemics. Seasonal influenza is characterized by a sudden

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onset of fever, cough (usually dry), headache, muscle and joint pain, severe malaise (feeling unwell), sore throat, and a runny nose. The cough can be severe and can last 2 or more weeks. Most people recover from fever and other symptoms within a week without requiring medical attention. However, influenza can cause severe illness or death, especially in people at high risk. Illnesses range from mild-to-severe and even death. Hospitalization and death occur mainly among high-risk groups.[3]

Influenza vaccination is the most effective way to prevent disease. Antiviral drugs are available for treatment, though viruses can develop resistance to the drugs.[4]

The first-confirmed case of A (H1N1) in India was reported on May 16, 2009. The patient was a passenger who traveled from the USA to Hyderabad.[5] Thereafter, transmission was reported from many parts of the country.[6]

The infection has already affected more than 23,000 people across India in 2019 itself, with Rajasthan bearing most of the brunt. The situation in India remains grim. The total number of cases till the first week of April 2019 has already exceeded the total number of cases of 2018. Rajasthan is the worst hit against a total number of 2375 cases in 2018, it has already reported 4952 cases till April 7 with 192 deaths.

The number of cases reported in India in the years 2017, 2018, and 2019 was 38,811, 14,992, and 23,289, respectively. In the year 2019, the highest number of cases, 4295, was reported from the state of Rajasthan. This was followed by other states as follows: Gujarat (4689), Delhi (3554), Karnataka (1271), Maharashtra (1170), Tamil Nadu (363), and Kerala (325) given in descending order.[7]

Punjab has shown a lot of fluctuation in the reported number of H1N1 cases and deaths annually in the years 2010 to 2015 reported so far.[8] There were 166 cases reported in the year 2016, followed by 239 and 47 cases in years 2017 and 2018, respectively.[9]

**Aim and Objectives**

The objectives of this study were as follows:
1. To study the descriptive epidemiology of H1N1 cases reported in Punjab in year 2018
2. To compare the attack rate (AR) of the study with previous studies of H1N1 in Punjab.

**METHODOLOGY**

This was a cross-sectional type of the study conducted in year 2019 at Sri Guru Ram Das Institute of Medical Sciences and Research, Amritsar. The surveillance system for H1N1 functions is going in Punjab through IDSP. Data were procured from the Directorate of Health and Family Welfare, Punjab, and were analyzed. All laboratory-confirmed cases of H1N1 reported from various districts of Punjab were included in the study. As per national guidelines, pharyngeal, or nasopharyngeal swabs are collected from suspected cases and their close contacts for detection of the virus using real-time-polymerase chain reaction assay. A suspected case of influenza-like illness and laboratory-confirmed influenza A had been defined. The only laboratory-confirmed cases were given the antiviral treatment.[10,11] The statistical analysis was done by applying the goodness of fit test.

**RESULTS**

There were 47 confirmed cases of H1N1 reported in Punjab in Year 2018. Population of Punjab in the year 2018 was 3,016,880.[12] This gave the AR of 1.558/Lakh population.

Table 1 is showing that higher number of cases, 29 (61.7%), were found in urban areas than 18 (38.3%) in rural areas. The difference in the number of cases reported from the rural and urban areas was found NS ($P \geq 0.05$).

**Age**

The mean age of 47 confirmed cases of H1N1 found was 46.09 ± 16.36 years. Among these cases, the minimum age was 2 years, and the maximum was 74 years.

Table 2 is showing age-wise distribution. It shows that the maximum number of cases 20 (42.6%) was reported in >50 years of age, followed by 12 (25.5%) in age 40–50 years. The minimum 1 (2.1%) case was reported in each 2–5, 6–10, and 11–20 years age groups. The difference in the number of cases in different age groups was found highly significant statistically ($P < 0.001$).

Table 3 shows 24 (51.1%) males and 23 (48.9%) females. The difference in the number of cases of males and females was found NS.

Table 4 shows the month-wise distribution. It shows that the maximum number of cases was reported in the month of December. The minimum number of cases was reported in the month of April. The difference in the number of cases reported in different months was found highly significant statistically ($P < 0.001$).

<table>
<thead>
<tr>
<th>Area</th>
<th>No.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>29</td>
<td>61.7</td>
</tr>
<tr>
<td>Rural</td>
<td>18</td>
<td>38.3</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>100.0</td>
</tr>
</tbody>
</table>

$\chi^2=2.57, \ d. f.=1, \ P=0.05$
Table 5 reveals the hospital-wise distribution of cases in government and private hospitals. Higher number of cases was found in private hospitals as compared to the government hospitals. The difference in the number of cases in government and private hospitals was found to be NS statistically.

Table 6 shows the hospital name-wise distribution. The maximum number of cases 12 (25.5%) was reported in Dayanand Medical College, Ludhiana, followed by 11 (23.4%) in Postgraduate Institute of Medical Education and Research, Chandigarh. The difference in the number of cases in various hospitals was found to be highly significant statistically ($P < 0.001$).

Table 7 shows district-wise distribution. The maximum number of cases reported 9 (19.1%) were from Sahibzada Ajit Singh Nagar. This was followed by Patiala 7 (14.9%), Ludhiana, and Hoshiarpur six each (12.8%) and the remaining from other districts. Figure 1 shows the district-wise...
difference in the number of swine flu cases reported was found to be significant statistically ($P < 0.05$).

**DISCUSSION**

The AR of H1N1 cases reported in this study in 2018 in Punjab had been observed as 1.558/Lakh population. In another study conducted in district Amritsar in year 2015, it was found to be 2.735/Lakh population. A study conducted in 2014 in district Amritsar showed that during the years 2009–2014, it ranged between 0 to 0.763/Lakh population.[13,14] It was found much higher than 1.9/Lakh population found in another study conducted in Hyderabad and some other parts of India in year 2009.[5]

Higher percentage of urban than that of the rural has been observed. This study resembled the previous studies of 2015 and 2016, but was contrary to the study of 2014, where higher percentage of the rural cases was found.[13-15] Age-wise distribution also resembles with the previous studies conducted in district Amritsar and in Punjab, that is, a maximum number of cases and higher percentage in the age above 50 and adult age groups.[13,14] Higher percentage of cases in the months of winter with its peak in December also resembled with previous studies conducted.[13-15]

Our study showed that private medical institutes were preferred for admissions compared to general hospitals. Considering that the private sector is generally preferred for the treatment of acute illnesses, this study showed that the public sector is competing well with the private sector for the management of H1N1.

**CONCLUSION**

Keeping in view the occurrence of higher number of cases from December to April, more emphasis should be laid on prevention and control measures in these months. Hence, awareness campaign should be launched before the month of December.

**Limitations of the Study**

The case fatality rate could not be calculated as the deaths of cases had not been recorded in the given data.

The study included that only H1N1 cases confirmed in designated laboratories of Punjab state. Thus, there is under-reporting of cases due to lesser availability of laboratory facilities.

There was an underestimation of the cases as the cases reported were the patients admitted in various hospitals only and not all the cases from the population.

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