

## Original Research Paper

**RETROSPECTIVE STUDY OF SWINE FLU CASES REPORTED IN A MEDICAL COLLEGE IN CHANDIGARH****Authors:****<sup>1</sup>Dr. Varsha Gupta, <sup>2</sup>Dr. Isha Dhawan, <sup>3</sup>Dr. Neelam Gulati, <sup>4</sup>Dr. Preeti Chaudhary, <sup>5</sup>Dr. Sohini Walia, <sup>6</sup>Dr. Priya Datta, <sup>7</sup>Dr. Lipika Singhal, <sup>8</sup>Dr. Nidhi Singla**<sup>1,2,3,4,5,7,8</sup>Department of Microbiology, Govt. Medical College and Hospital, Sector 32, Chandigarh. (India)<sup>6</sup>Post Graduate Institute of Medical Education and Research Chandigarh. (India)

Corresponding Author: Dr. Neelam Gulati, Department of Microbiology, Govt. Medical College and Hospital, Sector 32, Chandigarh. (India)

Article Received: 08-09-2022

Revised: 27-09-2022

Accepted: 17-10-2022

**ABSTRACT:**

**Introduction:** Influenza viruses, in particular, are highly unstable and are the etiological agents of the pandemics till date. In last decade, H1N1 reappeared as a serious threat as the swine flu pandemic of 2009. However, it was not zoonotic swine flu as the previous pandemics, but airborne droplets were documented as source of infection amongst humans. **Aims and Objective:** To analyse retrospectively the H1N1 cases reported in a medical college in Chandigarh from 2016 to 2021 and understand the epidemiology of the disease. **Methodology:** The nasopharyngeal and oropharyngeal samples of 920 patients who reported with influenza-like illnesses were collected after taking complete history. The samples were tested using real time PCR technique. **Results:** Out of 920 samples, 156 (16.93%) tested positive for H1N1 swine flu. The positivity rate was higher in females (9.13%) than males (7.83%). The most common symptoms reported in the positive cases were fever (92.31%) and cough (89.10%) followed by breathlessness (66.67%). **Conclusion:** H1N1 infection along with COVID-19 should be considered as the differential diagnosis for patients who present with influenza like illness or seasonal common respiratory diseases.

**Keywords:** H1N1, epidemiology, influenza like illness

**INTRODUCTION:**

Viruses have been considered as important factors various disastrous pandemics that have occurred in the history of mankind. Influenza viruses, in particular, are highly unstable due to their peculiar structures and have caused a number of pandemics. The exchange of genetic material among viruses can occur through transmission from different animal or human hosts leading to the formation of novel influenza virus which has led to the pandemics in the years 1918, 1957, and 1968, resulting in death and disaster (1). The famous swine flu of 1918 infected approximately 50 crore people around the world and led to elimination of 3% to 5% of the world population, thus establishing it as one of the deadliest pandemics in the history (2). The origin of the H1N1 Swine flu, has been found to be the result of mutation of the original swine viruses (2,3). The H and N followed by numbers indicate the type of antigenic site displayed on the virus. H donates to hemagglutinin and N represents neuraminidase both of which are common antigenic sites identified by host

immune systems (2). Recently, H1N1 reappeared as a serious threat when its original strain was noticed again in the swine flu pandemic which occurred in the year 2009(3). However, the studies revealed that the 2009 H1N1 virus was different from swine flu which affected various populations earlier, because it was not transferred from swine to humans. This variant spread through airborne droplets directly from infected humans and through human contact with inanimate surfaces contaminated with the virus. However, this recent disease had symptoms similar to those seen in the original swine flu (4,5). The first case of the recent type Swine Flu was reported in California in the United States on 15<sup>th</sup> April, 2009. (2). It became highly catastrophic as the available therapeutic interventions and methodologies were ineffective against the disease. Despite the quick response by the CDC, Swine Flu became a crisis in the subcontinent. Though the CDC continued investing in this viral outbreak, the WHO declared this infection as an international public health emergency on 25<sup>th</sup> April 2009 (6). The first

confirmed case of H1N1 in India was reported on 16<sup>th</sup> May 2009 in a passenger who travelled from the USA to Hyderabad. Thereafter, the transmission was reported from many parts of the country (7). Since then, swine flu cases have been reported globally as well as in India in variable numbers depending upon seasons as well as geographical factors, thus making the disease endemic.

**AIM AND OBJECTIVES:**

The aim and objectives were to study the descriptive epidemiology of the H1N1 cases reported in a medical college in Chandigarh from 2016 to 2021.

**METHODOLOGY:**

The present study included the samples of 920 patients who reported to the Department of Medicine with influenza-like illnesses. The standard form for H1N1 comprising complete personal details of the patient,

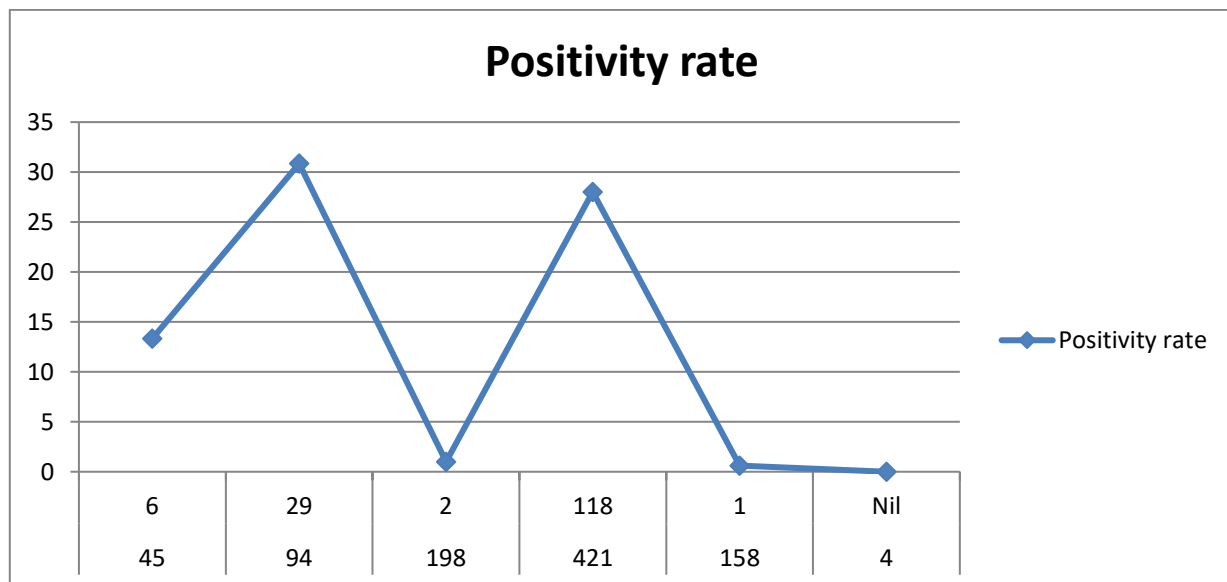
history of present illness, the duration of illness, detailed symptoms, and radiological observations was filled before collection of the sample. The samples were collected from the nasopharyngeal and oropharyngeal regions and stored in the viral transport medium. The samples of 99 patients, who reported with influenza like illnesses from April 2020 to December 2021, were sent to Department of Microbiology for COVID-19 testing as well. The samples were then processed using an ABI kit for real time PCR testing.

**RESULTS:**

920 samples were processed and analysed for detection of H1N1 viral infection. The yearly distribution of total samples and positive samples was as follows: (Table 1 and Table 2).

Year	Total samples	Positive samples	Positivity percentage
2016	45	06	13.33%
2017	94	29	30.85%
2018	198	02	1.01%
2019	421	118	28.02%
2020	158	01	0.63%
2021	04	Nil	0%

**Table 1. Yearly distribution of total sample and positive samples**



**Table 2. Yearly distribution of Positive cases**

487 samples were from males while 433 were from females resulting in an almost equal ratio of 1.12:1. Out of 920 samples, 156(16.96%) were found positive for H1N1 swine flu. Further, of the total 156 positive

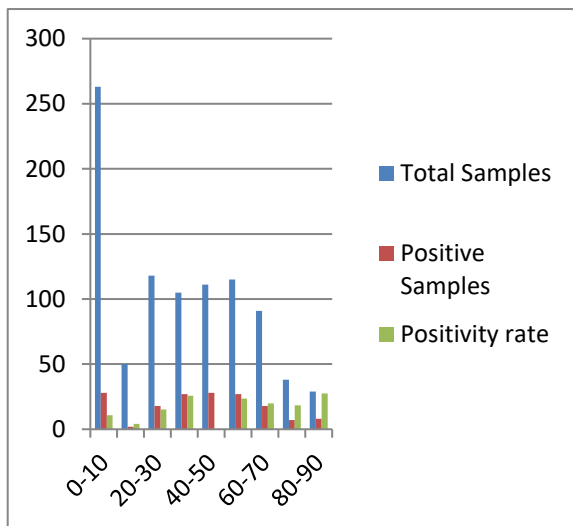
samples, 72 samples were from males while 84 were from females with a ratio of 1:1.16 (Table 3).

Total samples	Males	Females	Total Positive Samples	Males positive from total positive samples	Females positive from total positive samples	Males positive from total male samples	Females positive from total female samples
920	487	433	156	72	84	72	84
%age	52.93%	47.07%	16.96%	46.15%	53.85%	14.78%	19.39%

**Table 3. Sex distribution (total samples and positive samples)**

The age range of the patients whose samples were included in the study was found to be varying from 3 days to 90 years. Maximum samples were from the age group of 0-10 years followed by the 20-30 years age group. Maximum number of the positive cases were found in the age group of 0-10 years and 40-50 years

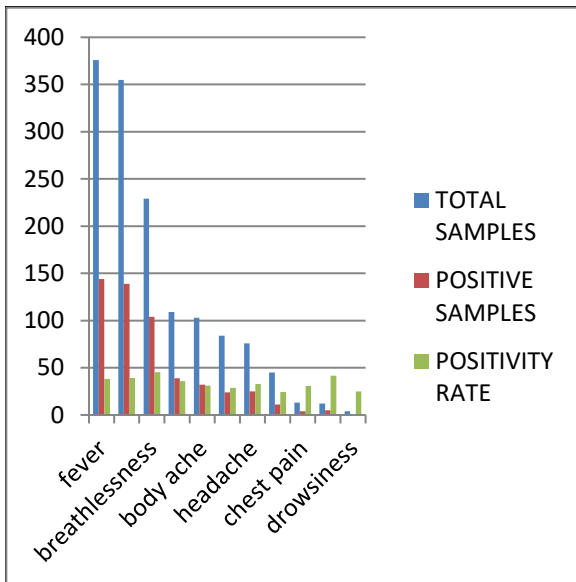
(28 positive patients each) followed by 30-40 and 50-60 age groups with 27 positive patients belonging to each group. However, the positivity rate was highest for the age group 80-90 years (27.58%) followed by age group of 30-40 years (25.71%) and 40- 50 years (25.22%) (Fig.1).



**Fig. 1. Age distribution of total samples and positive samples**

A wide range of symptoms such as fever, cold, cough, sore throat, body ache, vomiting, breathlessness, chest pain, headache, drowsiness, and diarrhoea was reported. Fever and cough were more common symptoms than breathlessness in both total samples as

well as positive samples. However, in terms of positivity rate, breathlessness was the most common symptom ( 45.41%) followed by cough (39.15%) and fever (38.29%) (Fig. 2).



SYMPTOMS	TOTAL SAMPLES	POSITIVE SAMPLES	POSITIVITY RATE
Fever	376	144	38.29
Cough	355	139	39.15
Breathlessness	229	104	45.41
Sore Throat	109	39	35.77
Body Ache	103	32	31.06
Cold	84	24	28.57
Headache	76	25	32.89
Vomiting	45	11	24.44
Chest Pain	13	4	30.76
Diarrhoea	12	5	41.66
Drowsiness	4	1	25

**Fig. 2: Distribution of Symptoms reported (total samples and positive samples)**

99 samples from the time period April 2020 to December 2021 were tested for both COVID-19 and Swine Flu but were found to be negative for both the tests.

## **DISCUSSION:**

Swine influenza, as the name suggests, is a disease of the respiratory tract of pigs. It is a highly contagious infection and can spread to humans who are in close contact with the infected animals [7]. Over the past few years, this viral infection has spread worldwide and has been considered as a rapidly emerging disease. Though Influenza in itself is a mild and self-contained illness, it still possesses ability to cause significant morbidity due to its tendency of rapid and extensive spread in the community (8). In the present study, the swine flu cases were slightly more in females than males. The result is similar to the study of Singh et al. in west Rajasthan in 2013 while in contrast to the present study, the study by Pradeepika et al. in Kakinada in 2018 showed that males were more affected. However, no significant difference in sex predilection was observed in the study in Punjab by Harjot et al. The age groups with maximum number of positive cases were 0-10 years and 40-50 years in the present study. This is in contrast to the study by Pradeepika et al in Kakinada in 2018 and the study in Punjab by Harjot et al. where the most affected age group was 50-60 years. However, the positivity rate was found to be higher in the age group 80-90 years. This could be attributed to the higher susceptibility of these patients due to various factors. In the areas of low socio-economic population, where the people reside close to each other, have low hygiene, and have

a compromised environment, the chances of developing the disease are higher. However, the negligence of the symptoms by the patients or indulgence in the practice of self-medication which is a common practice in the Indian population is one of the major reasons for the underreporting of the disease. The most common symptoms reported in the positive cases were breathlessness (45.41%) followed by cough (39.15%) and fever (38.29%). The results were similar to those of the study done by Pradeepika et al. in Kakinada in 2018, where the common presenting symptoms were breathlessness (99.1%), cough (98.6%), and fever (80.67%). In contrast to the present study, Tamil Nadu indicated contrasting results with the commonest symptom being cough (100%) with throat pain (96.9%), common cold, fever (93.8%), and breathlessness (83.1%) reported as other symptoms. Variations in the results found in the present study in comparison to other studies can be attributed to various factors such as sample size, geographical location, and social factors. In the present study, higher positivity in females could be attributed to ignorance of initial symptoms, poor personal care, and lower immunity. Although patients in this study comprised a sizeable proportion of the cases from Chandigarh and the surrounding areas, the findings of the present study cannot be generalized to a large population as the study was restricted to hospitalized patients. The present study included samples of patients who

reported influenza-like illnesses from the year 2016 to 2021. However, with the emergence of the new pandemic COVID-19 in December 2019 which had presented with initial similar symptoms, was more contagious and deadlier, the focus has been shifted towards this new disease. The worldwide assault of SARS CoV-2 contagion has led to ignorance of common and seasonal flu infections, particularly during the seasonal peak times. In the last 2-3 years, any influenza-like illnesses have been majorly tested for COVID-19 rather than swine flu or H1N1 infection (20). The same trend was observed in the present study as well since the number of samples submitted for H1N1 testing during the year 2020-2021 was considerably low. While the focus was shifted to COVID-19, even the samples tested for H1N1 during this period did not give any positive results. SARS CoV-2 being highly contagious has swept the whole population leaving less scope for the transmission of H1N1. H1N1 infection is an important differential diagnosis for the patients who present with fever and respiratory illness or pneumonia. Early detection of H1N1 infection and prompt initiation of the appropriate treatment is important for preventing the complications and mortality. Fever, cough, and breathlessness were the common presenting symptoms of swine flu as seen in the present study. Thus, patients with pneumonia or other debilitating conditions, who present with fever, cough, and breathing problems should be suspected of swine flu along with COVID-19 in the current scenario. Both the tests should be considered equally important and management must be rationalized accordingly.

#### REFERENCES:

- Narain JP, Bhatia R. Influenza A (H1N1): Responding to a pandemic threat. *Indian J Med Res* 009; 129:465–7.
- World Health Organization (WHO). Pandemic (H1N1) 2009 — Update. *Disease Outbreak News (WHO)*; 2010 May 14.
- Shahzaib m, Haq EU. H1N1 Influenza Virus (Swine Flu): A Comprehensive Insight into Escalating Catch-22 Scenarios. *Univ Louisville J Respir Infect* 2021; 5(1):Article 4. doi: 10.18297/jri/vol5/iss1/4.
- Rewar S, Mirdha D, Rewar P. Treatment and Prevention of Pandemic H1N1 Influenza. *Ann GlobHealth*. 2015 Sep-Oct;81(5):645-53. [PubMed: 27036721]
- Keenliside J. Pandemic influenza A H1N1 in Swine and other animals. *Curr Top Microbiol Immunol*.2013; 370:259-71.
- Thompson WW, Weintraub E, Dhankhar P, Cheng OY, Brammer L, Meltzer MI, et al. Estimates of US influenza-associated deaths made using four different methods. *Influenza Other Respir Viruses* 2009; 3:37-49.
- World Health Organization. Newsroom. Influenza (Seasonal). Available from: [https://www.who.int/news-room/fact-sheets/detail/influenza-\(seasonal\)](https://www.who.int/news-room/fact-sheets/detail/influenza-(seasonal)). [Last accessed on 2019 May 13].
- World Health Organization. Fact Sheet on Influenza; 2016. Available from: [https://www.who.int/news-room/fact-sheets/detail/influenza-\(seasonal\)](https://www.who.int/news-room/fact-sheets/detail/influenza-(seasonal)). [Last accessed on 2019 May 26].
- John TJ, Moorthy M. 2009 pandemic influenza in India. *Indian Pediatr* 2010;47:25-31.
- Mukherjee A, Roy T, Agrawal AS, Sarkar M, Lal R, Chakrabarti S, et al. Prevalence and epidemiology of pandemic H1N1 strains in hospitals of Eastern India. *J Public Health Epidemiol* 2010;2:171-4.
- Kaur B. Swine Flu Virus Changing Seasonality, Geography. Available from: [www.downtoearth.org.in/news/health/swine-flu-virus-changing-seasonality-geography-63992](http://www.downtoearth.org.in/news/health/swine-flu-virus-changing-seasonality-geography-63992). [Last accessed on 2020 Apr 15].
- MOHFW. Seasonal Influenza (H1N1) State/UT-Wise, Year-Wise Number of Cases and Deaths from 2010 to 2017. Available from: <https://www.idsp.nic.in/1892s/39337430821526301425>.
- DOHFW. Swine Flu (H1N1) Positive Patients in the Year 2018. Available from: <https://www.main.mohfw.gov.in/swine-flu-h1n1-seasonal-influenza>. [Last accessed on 2020 Jun 23].
- Government of India, Ministry of Health and Family Welfare, DGHS, National Centre for Disease and Control. Influenza A (H1N1). Guidelines for Sample Collection and Handling of

- Human Clinical Samples for Laboratory Diagnosis of H1N1 Influenza; 2009. Available from: <https://www.main.mohfw.gov.in/sites/files/2366426352>.
15. Singh H, Mahajan SL, Kaur S, Kahlon A. Epidemiological Study of Swine Flu (H1N1) in Punjab in the Year 2018. *Annals of Community Health*. Oct-Dec 2020, Vol 8, Issue 04.
  16. Mahajan SL, Devgun P, Raj D, Gill KP, Brar AP. Epidemiological profile of H1N1 cases in district Amritsar in the year 2015. *Indian J Public Health Res Dev* 2017;8:29-33.
  17. Singh M and Verma S. An epidemiological study of a recent outbreak of Influenza A H1N1 (Swine Flu) in Western Rajasthan region of India. *J Med Allied Sci* 2013 ; 3(2 ) : 48-52
  18. Pradeepika MM, Mathangi K, Chakravarthy K, Kumar KR. Review of swine flu positive cases in Kakinada-2018. *Indian Journal of Immunology and Respiratory Medicine* 2020;5(1):52–56 53.
  19. Mahajan SL. Descriptive epidemiology of H1N1 cases in district Amritsar from year 2009 to 2014. *Indian J Public Health Res Dev* 2016;7:193-9.5 *Annals of Community Health* OCT-DEC 2020, vol 8, issue 04.
  20. Burlacu A, Dabija RC, Popa IV and Covic A. The Second Wave of COVID-19 Pandemic Strikes during the Flu Season: An Awareness Perspective. *Medicina* 2020, 56, 707