

Clinico-Epidemiological Profile, Pandemic Influenza A H1N1/2009 and Seasonal Influenza, August 2009-March 2013, Himachal Pradesh, India

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ABSTRACT

Background: Novel influenza A (H1N1) virus emerged in April, 2009, spread rapidly to become pandemic by June, 2009. **Objective:** To study the clinico-epidemiological profile of pH1N1 and seasonal influenza (SI) from 2009 to 2013. **Materials and Methods:** Retrospective, hospital-based study was done by reviewing medical records for collecting demographic and clinical profile of the study samples. **Result:** Out of 969 samples, positivity and case fatality for pH1N1 and SI was 9.39 and 20.87% vs 11.76 and 7.89%, respectively. Among pH1N1 and SI, sex distribution, mean age, and age group involved were 54.95% females, 37.10 years, and 20-29 years (23.08%) vs 43.86% females, 40.32 years, and 20-29 years (22.81%), respectively. Mortality shift was observed from younger to older and healthier, 75% to comorbid, 100% from 2009-2010 to 2012-13 for pH1N1. **Conclusion:** We observed seasonal variation, cocirculation, similar clinical features, decreased virulence, and community spread with respect to pH1N1 and SI from 2009-2013.

Keywords: Epidemic, pandemic, pandemic (H1N1), seasonal influenza

Introduction

In March 2009, pandemic influenza A H1N1/2009 (pH1N1) virus emerged as a public health burden on the healthcare system worldwide.⁽¹⁾ In India the pandemic started in August 2009.⁽²⁾ Across India 203,165 samples were tested for pH1N1 till January 2011 and 22.80% ($n = 46,142$) of them have been found positive with a mortality figure of 5.9% ($n = 2728$).⁽³⁾ To provide effective and efficient patient care and preventive plan for future pandemic; thorough evaluation of the epidemiological pattern and clinical presentation of the disease needs to be analyzed. With this perspective the current study was carried out.

Materials and Methods

Hospital-based retrospective study was conducted at Indira Gandhi Medical College (IGMC) Shimla, Himachal Pradesh from August 2009 to March 2013. A confirmed case of pH1N1 was defined as an individual with influenza-like illness (ILI) and laboratory-confirmed pH1N1 detected by real time reverse transcriptase polymerase chain reaction. Demographic and clinical profiles were collected by reviewing medical records using standardized, close-ended instrument and year was taken from April to March.

All the data was analyzed using Epi Info 7⁽⁴⁾ and Yates corrected chi-square (χ^2) test. P -value <0.05 was considered statistically significant.

Result

Out of the 969 cases presenting with ILI, 9.39 and 11.76% were positive for pH1N1 and seasonal influenza (SI), respectively. Positivity was higher in winter months

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(December-February) both for pH1N1 (45.05%) and SI (60.52%).

Sex distribution was higher among females for pH1N1 (54.95%) and SI involved more males (56.14%). Most common age group involved amongst males and females by pH1N1 was 21-30 years (21.95%) and 31-40 years (22%), respectively. SI affected 21-30 years both for males (25%) and females (30%).

Case fatality rate was 20.87% for pH1N1 and 7.89% for SI ($\chi^2 = 6.17, P < 0.01$). Mortality due to pH1N1 was highest in 31-40 years (75, 50, 100%, respectively) from 2009 to 2012 except for the year 2012-2013 where it was in 51-60 years (83.33%). For SI it was among 51-60 years (40%) for the year 2009-2010, 11-20 year (100%) in 2010-2011, and no mortality in the year 2012-2013. However for the year 2011-2012, total of three deaths were observed, in the age group of 31-40, 51-60, and ≥ 61 years.

Significant clinical profile associated with pH1N1 and SI cases is illustrated in Table 1 and those who died is depicted in Table 2.

Comorbid cases among pH1N1 and SI were 50 and 31.25%, respectively. Comorbidities associated with

Table 1: Clinical profile of admitted cases of pH1N1 and SI with significant association, August 2009 to March 2013, Himachal Pradesh, India

Clinical profile	H1N1 n (%)	Seasonal influenza n (%)	χ^2	P-value
Sore throat	32 (46.38)	32 (33.33)	2.35	0.04
Comorbid conditions	35 (53.85)	30 (46.15)	5.21	0.007
Rigor and chills	44 (62.86)	35 (36.46)	10.27	0.0004
Consolidation	47 (67.14)	33 (34.38)	16.12	0.00001
Fever	48 (68.57)	52 (54.17)	2.93	0.03
Crepts	51 (72.86)	46 (47.92)	9.36	0.0006
Shortness of breath	52 (74.29)	61 (63.54)	1.68	0.07

*P - value < 0.05 taken as significant

Table 2: Risk factors associated with mortality among pH1N1 and seasonal influenza, August 2009 to March 2013, Himachal Pradesh, India

Variable	pH1N1 (n = 70)			Seasonal influenza (n = 96)		
	Alive N = 55	Died N = 15	χ^2 (P - value)	Alive n = 87	Died n = 9	χ^2 (P - value)
Hemoptysis	3 (5.45)	5 (33.33)	6.50 (0.004)	7 (8.05)	2 (22.22)	0.6 (0.11)
Comorbid conditions	24 (43.64)	11 (73.33)	3.05 (0.02)	24 (27.59)	6 (66.67)	4.12 (0.01)
Cyanosis	11 (20)	11 (73.33)	13.17 (0.0001)	15 (17.24)	6 (66.67)	8.94 (0.001)
Rigor and chills	33 (60)	11 (73.33)	0.41 (0.18)	28 (32.18)	7 (77.78)	5.48 (0.005)
Fever	34 (61.82)	14 (93.33)	4.06 (0.008)	45 (51.72)	7 (77.78)	1.3 (0.07)
Crepts	37 (62.27)	14 (93.33)	2.83 (0.02)	38 (43.68)	8 (88.89)	4.99 (0.005)
Shortness of breath	38 (69.09)	14 (93.33)	2.46 (0.02)	53 (60.92)	8 (88.89)	1.67 (0.05)
Consolidation	32 (58.18)	15 (100)	7.54 (0.0005)	24 (27.59)	9 (100)	15.88 (0.00)
Ventilatory support	3 (5.45)	12 (80)	34.59 (0.00)	1 (1.15)	2 (22.22)	6.01 (0.01)

*P - value < 0.05 taken as significant

pH1N1 and SI were respiratory (45.71 vs 50%), cardiovascular (11.41 vs 16.67%), renal (11.43 vs 0%), endocrine (14.28 vs 6.67%), and others (8.6 vs 10%), respectively.

Four pregnant women (2.41%) were admitted with ILI. Out of them, three were positive for H1N1. Mortality was only observed with one H1N1 positive pregnant woman. On chest roentgenogram, bilateral lower lobe consolidation for pH1N1 was 74.46% as compared to 45.45% in SI.

Discussion

The incidence of pH1N1 among patients, diagnosed at Indira Gandhi Medical College (IGMC), Shimla was 9.39%. Other studies done in India and other part of the globe found the incidence between 7 and 29.58%.^(2,5-7) Categorization of cases might have resulted in the difference of incidence in different studies.

Both pH1N1 and SI cocirculated from August 2009 to March 2013; however, they reduced and displaced each other during the given time period similar to observations reported by Mukherjee *et al.*⁽⁵⁾ The age shift for pH1N1 noted from 31 to 50 years from 2009-2012 is in concurrence with other studies.^(8,9) However in the year 2013, again young adults in the agegroup of 31-40 years were more affected. This may be due to development of immunity in the younger population. No such trend was observed with SI.

Significant correlations were observed between the preexisting medical conditions of the patients and the outcome similar to Louie *et al.* for pH1N1. The proportion of laboratory-confirmed pH1N1 hospitalizations and deaths was higher among subjects⁽³⁾ 40 years for the year 2013 (100%); whereas in the year 2009, deaths were observed in the younger age group, that is, 21-40 years (75%). Results of our study are consistent with that of Viasus *et al.*⁽¹⁰⁾ This may be attributed to acquisition

of herd immunity among younger age group with subsequent time and the presence of comorbidity among the population aged⁽³⁾ 40 years and above.

Conclusion

The clinical profile of pH1N1 associated pneumonia varied characteristically from the clinical profile of SI. Younger age, healthy individuals, extensive roentgenogram lesions, severe respiratory distress, and requiring ventilator support were the key clinical features when the pandemic started. Pregnancy was an additional risk factor. There were higher proportions of pH1N1 cases in winter as compared to SI which peaked during monsoon. We suggest early diagnosis and timely initiation of treatment with antiviral drugs to enhance patient recovery.

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