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Short Communication

Outbreak of Influenza (H1N1) amongst children in a residential school

Lt Col A.S. Kushwaha^{a,*}, Lt Col Prabhakar Teli^b, Air Cmde Ajoy Mahen^c

^a Classified Specialist (Community Medicine), ADH HQ 16 Corps, C/O 56 APO, India

^b Commanding Officer, Station Health Organization, Babina, India

^c Professor & Head, Department of Community Medicine, Armed Forces Medical College, Pune 40, India

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ABSTRACT

Background: An outbreak of pandemic Influenza H1N1 occurred from 13 Feb to 20 Feb 2010 in a residential school at Belgaum, India.

Methods: On report of sudden increase in number of students reporting sick with symptoms suggestive of flu like illness, an investigation was launched to detect the source of infection and to control the spread of infection amongst those not affected. Six random samples of throat from the initial cluster were collected and RT-PCR was done to confirm the diagnosis. The outbreak in this institution was effectively controlled by standard preventive & control measures in the absence of vaccine.

Result: In a school of 335 children, 96 cases of Influenza like illness possibly resulting from pH1N1 (2009) were reported with an attack rate of 28.6%. Out of a total of 96 cases reported, 73 (76%) were hospitalized and 23 treated as outdoor patients. Serogroup A of Influenza H1N1 pandemic was identified to be the agent responsible for this outbreak as 06 random samples drawn from initial cluster tested positive on RT-PCR. A visit to an exhibition in the city was possibly the source of exposure amongst the children.

Conclusion: An outbreak of Influenza H1N1 infection amongst students in a residential public School was found to be linked to a visit to an exhibition following which the secondary transmission led to further occurrence of cases.

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Introduction

The outbreak of Influenza H1N1 infection like any droplet infection can be easily transmitted in the settings of a school and especially residential school as has been exemplified during the recent pandemic of Influenza. Global experience with pandemic (H1N1) 2009 in many countries has demonstrated the importance of schools in amplifying transmission of the pandemic virus; both within schools and the wider community.¹

Transmission of epidemic seasonal Influenza in school settings is well documented and can be explosive and fast moving, affecting a sizeable proportion of students and staff. The children staying in the hostels face additional risk as they are staying in a closed community. Investigations have identified large social gatherings (and school-related activities involving large gatherings) as risk factors for increased Influenza transmission in schools.² Other identified risk factors for pH1N1 transmission including attendance at large social events, close

* Corresponding author.

E-mail address: arvind6077@yahoo.com (A.S. Kushwaha).

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contact with a sick person, and sharing a classroom with a sick person.^{3–5} We undertook an epidemiological study of an outbreak of H1N1 Influenza amongst students in the residential public school. A sudden rise in viral fever was reported from the school on 13 Feb 2010. A suspicion of an impending outbreak of Influenza H1N1 was considered, awaiting lab confirmation. Between 13 Feb and 20 Feb 2010, 96 cases of Influenza H1N1 infection were reported amongst students in this residential public school. Similar type of outbreak of H1N1 had been reported earlier from three other residential schools in Belgaum District. An outbreak has been reported in similar settings from Pune.⁶ The case definitions adopted were as given by WHO.

Settings and findings of the study

All the cases were from a residential school of Belgaum, Karnataka. Climate of the area is moderate. The school is located in the city and close to a Military Hospital. The weather conditions were late winters to early spring. The relative humidity was recorded from 65% to 85%. There were reports of similar type of outbreaks of H1N1 from three residential schools (personal communication) in Belgaum District and total number of confirmed H1N1 cases in Belgaum was 42 since 1 Jan 2010. The residential school had 335 students staying in the hostels. They were divided into four houses. There was a report that 42 students were complaining of viral fever on 13th Feb 2010. All of them were immediately referred to the hospital and admitted. A suspicion of an impending outbreak of Influenza H1N1 was considered and District Surveillance Officer was informed. The throat swab was collected from six random students and was sent to National Institute of Mental Health and Neuro Sciences (NIMHANS), Bangalore for investigation on the same day. A total of 335 students studying in classes 6th to 12th were accommodated in four houses. Even though no gross overcrowding was observed in houses but inadequate ventilation was seen which facilitates spread of any droplet infection like Influenza.

The entire outbreak lasted for about one week, from 13 Feb to 20 Feb 2010 (Table 1). The first 58 cases were clustered in time and space, probably forming a part of the initial outbreak due to common source exposure. The high attack rate in a single school, as well as the abrupt onset of the epidemic curve suggests that the children could have shared a point source common exposure. An epidemic curve (Fig. 1) was

Fig. 1 – Epidemic Curve of outbreak of H1N1 in a residential school.

prepared for the outbreak. The onset of the outbreak among the 58 symptomatic cases was abrupt (13 and 14 Feb) which could indicate a common exposure and secondary transmission from person to person in the following days (15–20 Feb). Out of 96 cases 68 (71%) cases are from VI, VII & VIII class students aged between 12 and 15 years. As per the history collected from the school as well as students it was revealed that on 11 Feb 2010, VI, VII & VIII class students (approximately 142 students) visited Dental Health Exhibition organized at KLE Hospital Belgaum. A spot map was prepared for the outbreak. It was quite obvious from the spot map that cases were evenly distributed in all the four houses thus strengthening the common exposure hypothesis.

Out of 96 reported cases the commonest symptom was body ache seen in 90 (94%). Other common symptoms were headache 88 (92%), cough 86 (89%), fever 73(76%), sore throat 40 (42%), 30 (31%) reported fainting and vomiting was seen in 2 (2%). All cases with fever were hospitalized in Military Hospital and treated with antivirals. Outdoor patients were given only symptomatic treatment. All cases recovered without any sequelae. Six throat swab samples randomly selected from the first 42 cases were collected on 14th Feb 2010. These were sent to (NIMHANS), Bangalore and tested by RT-PCR and declared positive for pandemic H1N1 (2009). All six tested positive for Influenza pH1N1 (2009).

In our study the high attack rate in a residential school, as well as the abrupt onset of the epidemic curve suggests that the children could have shared a common point source exposure.

Cases that occurred on 13 and 14 Feb were probably due to transmission from a contact with previously undiagnosed cases during their visit to Dental Health Exhibition organized at KLE Hospital, Belgaum. We did an analysis by case control method (Table 2) and it was revealed that the risk of

Table 1 – Distribution of cases according to date, house and disposal wise.

House	Dates of occurrence (February)								Total
	13	14	15	16	17	18	19	20	
A	06	03	04	02	04	02	–	01	22
B	17	03	–	02	01	01	–	02	26
C	08	08	02	04	03	01	–	–	26
D	11	02	–	04	02	02	–	01	22
Total	42	16	06	12	10	06	–	04	96
Distribution according to treatment type outdoor/indoor									
Adm	42	16	06	03	03	03	–	–	73
OPD	–	–	–	09	07	03	–	04	23

Table 2 – Distribution of cases according to possible exposure at an exhibition.

H/O visit to exhibition	Ill	Not ill	Total
Yes	53	89	142
No	43	150	193
Total	96	239	335

OR of 2.08 (95% CI 1.25 < OR < 3.46). Chi square value 9.06 significant at p value of 0.0026.

developing the disease was significantly higher amongst those who gave history of visit to the exhibition as compared to those who did not visit the exhibition with an OR of 2.08 (95% CI 1.25 < OR < 3.46) and also significant on doing a chi square test (Chi square value 9.06 significant at p value of 0.0026).

Conflicts of interest

All authors have none to declare.

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