

Outbreak of H1N1 Influenza among the Health Care Personnel in a Tertiary Care Hospital

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ABSTRACT

Context: During the spring of 2009, a pandemic of H1N1 influenza, which is popularly called as swine flu, emerged in Mexico and it spread worldwide. This affected not only the community at large, but also the health care providers who attended to these cases.

Aims: We report here, the occurrence of the H1N1 infection among the health care personnel (HCP) who were working in our hospital.

Settings and Design: This study was conducted in the Department of Microbiology of a tertiary care, referral, teaching hospital. The study design was an observational report of the case series.

Materials and Methods: A total of 107 suspected cases of H1N1 influenza were screened between August 2009 and November 2010, of which 31 were health care personnel. 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.

Results: Of the 31 health care personnel who were screened, 7(22.6%) were confirmed as positive for H1N1 influenza. The maximum number of cases occurred in the age group of 15-45 years and all the health care workers who were positive were male doctors, except one, a female nurse. None of the health care workers had used personal protective equipment (PPE).

Conclusions: Healthcare personnel are at increased risk of occupational exposure to the H1N1 virus, based on their likelihood of encountering the patients with this illness. The H1N1 influenza virus caused a greater disease in younger people, which included those in the age range of most of the healthcare personnel. The PPE should be worn by all the health care workers during the initial contact with any patient with an unknown health status.

Key Words: Health care personnel, H1N1 influenza, Personal protective equipment

KEY MESSAGE

- Healthcare personnel are at increased risk of occupational exposure to the 2009 H1N1 virus, based on their likelihood of encountering patients with this illness. The 2009 H1N1 influenza virus caused a greater relative burden of the disease in younger people, which included those in the age range of most of the healthcare personnel. Thus PPE should be worn by all the health care workers during the initial contact with any patient with an unknown health status.

INTRODUCTION

The transmission of the novel influenza A (H1N1) virus to the health care personnel (HCP) occurs in both the health-care and community settings and additional messages which are aimed at reinforcing the current infection-control recommendations are needed [1]. Efforts to gain a fuller understanding of the prevalence of the serious H1N1 illness and fatalities among the HCP have been limited due to a lack of occupational data in the existing healthcare surveillance systems. More efforts are needed in order to fully appreciate the prevalence of the severe H1N1 illness among this group [2].

The U.S. Centers for Disease Control and Prevention (CDC), the World Health Organization, the Society for Healthcare Epidemiology of America, and many other worldwide, governmental, and niche professional groups have made the HCP safety and the prevention of the nosocomial spread of the 2009 H1N1 virus, their top priorities [3].

Soon after the identification of the novel influenza A (H1N1) virus infections in mid-April 2009, the CDC provided interim recom-

mendations to reduce the risk for its transmission in health-care settings. These included recommendations on the use of personal protective equipment (PPE), the management of the HCP after unprotected exposures, and instructions to all the ill HCP not to report to work [1].

Although the transmission of this infection within the community may outpace that within the hospitals, the HCP are a part of both the communities; therefore, they have greater opportunity for exposure, particularly in the outpatients setting [3]. We report here, the occurrence of the H1N1 infection among the HCP, including doctors, nurses and group D workers of our hospital, which is a tertiary care, referral, teaching hospital in Bangalore.

SUBJECTS AND METHOD

This study was conducted in a tertiary care government hospital in Bangalore, which is attached to a medical college which mainly caters to people from the lower socio-economic groups. However, during the outbreak of the H1N1 influenza, our hospital provided screening and treatment for all the patients, irrespective of their

socio-economic status [4]. After obtaining permission from the superintendent and the director 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 H1N1 out-patients department, with special reference to the health care personnel with suspected H1N1 influenza in the hospital from August 2009 to November 2010, was analyzed. A total of 107 suspected cases were referred to the Department of Microbiology for H1N1 screening during this period.

Thus, the persons who presented with flu-like symptoms were categorized 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 and refusal to accept feeds) [4].

The throat and nasal swabs were collected for the category C cases in the viral transport media (VTM) and were sent to a government designated referral laboratory for testing and confirmation by the Polymerase Chain Reaction (PCR). The results were analyzed and discussed.

RESULTS

A total of 107 suspected cases of H1N1 influenza with the category C symptoms, who presented to our hospital between August 2009 and November 2010, were screened, out of which 76(71%) were from the general population, 23(21.5%) were doctors including consultants, residents and interns, 6(5.6%) were nurses and 2(1.9%) were other workers of the hospital. Of the 107 who were tested, 15 were confirmed as positive for H1N1 influenza. This included 8(53.33%) from the general population, 6(40%) doctors and 1(6.7%) nurse. None of the other HCPs were infected.[Table/ Fig 1]

The maximum number of cases i.e 60% were in the age group of 15-45 years. Among the doctors, 6 were positive, of which 4(66.7%) were between 15-45 years and 2(33.3%) were >45 years

General Population		Doctors		Nurses		Group D workers		Total	
Tested	Positive	Tested	Positive	Tested	Positive	Tested	Positive	Tested	Positive
76 (71.0%)	8 (53.3%)	23 (21.5%)	6 (40%)	6 (5.6%)	1 (6.7%)	2 (1.9%)	0 (0%)	107 (100%)	15 (14.0%)

[Table/Fig-1]: Distribution of H1N1 cases among the categories

Category	Age<15yrs Tested	Age<15yrs Positive	Age 15-45 yrs Tested	Age 15-45 yrs Positive	Age >45 yrs Tested	Age >45 yrs Positive
General Population	9	1	49	5	18	2
Doctors	0	0	15	4	8	2
Nurses	0	0	4	0	2	1
Group D workers	0	0	2	0	0	0
Total	9 (8.4%)	1 (6.7%)	70 (65.4%)	9 (60%)	28 (26.2%)	5 (33.3%)

[Table/Fig-2]: Age distribution of cases positive for H1N1

old. All the doctors who tested positive were males.[Table/Fig 2]

All the 6 doctors who tested positive for H1N1 influenza, presented after 4-5 days of the onset of continuous high grade fever, cough, running nose, sore throat and difficulty in breathing, which did not respond to antibiotic therapy. All of them had no history of exposure in the community and none had co-morbid illnesses like diabetes or hypertension. The nurse who tested positive for H1N1 influenza was a diabetic and had a history of travel and exposure to the flu cases. All the cases were treated on an out-patients basis and required no admission. They responded well to the antiviral drug, Oseltamivir and had a complete recovery within 10 days.

DISCUSSION

The CDC received 48 reports of confirmed or probable novel influenza A (H1N1) infection among the HCP from 18 states of the United States of America during this pandemic [1]. In our study, of the 15 who were confirmed as positive for H1N1 influenza, 6(40%) were doctors and 1(6.7%) was a nurse. None of those who were infected were vaccinated at the time of the exposure. Among the 7 infected health care personnel, 6(85.7%) reported that they cared for a patient with a respiratory illness, which is similar to the findings of a report which was submitted to the CDC [1]. By using the criteria for the assessment of the infection acquisition [1], 6(85.7%) were deemed to have been infected in a health-care setting, which included a probable patient to HCP transmission. Community transmission was deemed as most likely for 1(14.3%) HCP, whereas in the report which was submitted to the CDC, the transmission in the health care setting was 50%, while the community transmission was 42% [1]. This increased hospital acquired transmission could be attributed to the failure of these health care personnel in using personal protective devices in spite of the guidelines which were prescribed by the World Health Organization (WHO) for the health care personnel [5].

Of the 6 HCP, none reported the use of personal protective equipment (PPE) when caring for the presumed source patients. Ideally, the HCP should have been wearing PPE during the initial contact with any patient with an unknown health status [3]. In spite of the adequate knowledge and awareness about the importance of PPE and the adequate stock of PPE being available at the hospital, none of the HCP reported that they used either a surgical mask or an N95 respirator nor gloves. None reported that they used eye protection. This was similar to the findings of the report that was submitted to the CDC [1], whereas in the other HCP like nurses and the Group D workers, there was a better compliance with regards to the PPE usage.

Category	Male		Female	
	Tested	Positive	Tested	Positive
General Population	38	4	38	4
Doctors	21	6	2	0
Nurses	0	0	6	1
Group D workers	1	0	1	0
Total	60 (56.0%)	10 (66.7%)	47 (44.0%)	5 (33.3%)

[Table/Fig-3]: Sex distribution of cases positive for H1N1

Although no data are available on why the recommended practices were often not followed in these situations, a similar non-adherence with recommended PPE by the HCP who cared for the patients with febrile respiratory infections had been documented previously for influenza and other respiratory infections. The barriers to the adherence can include (1) a belief that these practices are not necessary, inconvenient, or disruptive; (2) lack of availability of PPE; (3) inadequate training in infection control; (4) failure to establish effective, systematic approaches to HCP safety; and (5) failure to recognize the patients and activities that warrant specific infection-control practices [6,7,8].

Healthcare facilities should have as their top priority, the means for the elimination of the occupational exposure to the 2009 H1N1 virus to preserve the health of all the HCP. The recognition of the infectious potential in an asymptomatic person is effective only through the implementation of systematic and widespread strategies to mount a sufficient response to reduce the threat to the healthcare team [3]. At the October 2009 World Health Organization Conference in Washington, DC, it was reported that the 2009 H1N1 virus had a wide spectrum of clinical presentations and that it may have an asymptomatic carrier rate as high as 9%, while underscoring the high risk to the healthcare team [9]. Innovative triage techniques must be developed and used to safeguard the HCP and the patients [3]. Initial triage and history-taking should be performed while maintaining an appropriate distance until a coughing or sneezing patient is provided with a surgical mask [3].

Reports in the news media have associated the deaths of at least four nurses with 2009 H1N1 influenza², but in our hospital, of all

the HCP had a complete recovery without hospitalization and none developed any complications.

In the health care workers, the average vaccination rate was only 37%. A Cleveland clinic previously increased the rate of vaccination among its employees via a program in which all the workers either had to be vaccinated or had to formally declare (on an internal website) that they had declined to be vaccinated [10]. Our hospital has since then developed a vaccination protocol and all the health care workers have received the flu shot. There has been a 100% vaccination coverage in our hospital. (Reference 9 has been mentioned in the text as well as in the reference list)

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