

# Experience of Pandemic Influenza A (H1N1) 2009 at Dhaka Medical College Hospital

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## Abstract

**Introduction:** Bangladesh recorded the first case of 2009 pandemic influenza A (H1N1) virus infection on 18<sup>th</sup> June 2009. This report describes the clinical and epidemiological characteristics of both the indoor and outdoor patients reporting in Flu Ward and Flu Corner of Dhaka Medical College Hospital.

**Methods:** This cross-sectional study was done on highly suspected 833 registered outdoor (flu corner) and 28 indoor patients admitted in Flu ward of Dhaka Medical College Hospital during the study period of August 2009 to November 2009. A suspected case was defined as an influenza-like illness and either a history of travel to a country where infection had been reported in the previous 7 days or an epidemiologic link to a person with confirmed or suspected infection in the previous 7 days. A confirmed case was defined by a positive real-time reverse-transcriptase polymerase chain reaction (RT-PCR) assay.

**Results:** Most of the patients were in between 20 to 30 years age group. Indoor patients presented with mostly fever (92.85%), rhinorrhea (71.42%), shortness of breathe (89.28%) and cough (64.28%). Maximum duration of fever in indoor patients was 4 days. RT-PCR from throat swab sample for H1N1 tested positive in 9 (32.14%) indoor patients. Out of the 833 outdoor patients 596(71.54%) patients had fever, 585(70.22%) had cough, 410(49.21%) had rhinorrhea and 314(37.69%) had sore throat. Only 2(7.14%) admitted patients died of flu.

**Conclusion:** Despite widespread infection mortality rate is quite low. Prompt implementation and adherence to national guidelines on 2009 pandemic influenza A (H1N1) should be encouraged.

**Keyword:** Pandemic influenza A (H1N1), Dhaka Medical College Hospital, Bangladesh.

## Introduction

Over the last couple of decades the world has faced the emergence and re-emergence of a number of infectious diseases. Within a very short period of time we have seen that SARS and Avian influenza (Bird Flu) devastated life globally. The '2009 Pandemic Influenza A' is a new strain of H1N1 influenza virus.<sup>1,2</sup> The outbreak in the state of Veracruz, Mexico was detected in April 2009.<sup>1,2</sup> World Health Organization (WHO) announced pandemic alert level 6 on 11th June, 2009.<sup>3</sup> In less than 20 days this alert level was raised from 5 to 6 and now the infection has spread to 208

countries all over the world with 2,46,571 confirmed cases and 9596 deaths.<sup>4</sup> Level 6 indicates widespread human infection where a global pandemic is ensuing.<sup>5</sup> This is the first influenza pandemic since 1968 when the influenza A (H3N2) swept across the world.<sup>6</sup> In late April, 2009 it was confirmed in Mexico and the United states that a novel influenza virus with unique genetic and antigenic characteristics has emerged.<sup>7</sup> The 2009 H1N1 virus is a triple-reassortant influenza virus containing genes from human, swine, and avian influenza viruses.<sup>8,9,10</sup> Now the virus is spreading from person-to-person in multiple countries in

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Europe, the Americas and the Far East. For the first time in history, health authorities around the world are watching the situation very closely with “real-time” data on outbreak emanating from every corner of the world. This can be attributed to the synchronous and prompt sharing of information unlike the early days of SARS outbreak in China in 2003.<sup>11</sup> The first case of swine flu in Bangladesh was detected on 18th June, 2009. In Bangladesh there were 803 confirmed cases of H1N1 infection and among them only 6 patients died.<sup>12</sup>

All patients with confirmed infection and suspected severe infection had been hospitalized and quarantined in an isolated Flu ward in the Dhaka Medical College Hospital to isolate them from the general population. The hospital quarantine allowed us to closely monitor the patients, its clinical features, the results of laboratory and radiographic tests, and the nature and extent of the disease. This report describes the clinical and epidemiologic characteristics of the first 28 indoor and 833 outdoor (at Flu corner) patients in Dhaka Medical College Hospital from August to November 2009 of pandemic influenza A (H1N1) virus infection.

#### Materials & Methods

This was a cross sectional study. The study was done on highly suspected 833 recorded outdoor (flu corner) and 28 indoor patients admitted in Flu ward of Dhaka Medical College Hospital during the study period of August to November 2009. A datasheet was made and filled up with recording of all relevant parameters. It was then assessed and evaluated. Results were analyzed by using statistical software program SPSS version 12. A suspected case was defined as an influenza-like illness (temperature  $\geq 37.5^{\circ}\text{C}$  and at least one of the following symptoms: sore throat, cough, rhinorrhea, or nasal congestion) and either a history of travel to a country where infection had been reported in the previous 7 days or an epidemiologic link to a person with confirmed or suspected infection in the previous 7 days. A confirmed case was defined by a positive result of a real-time reverse-transcriptase–polymerase-chain-reaction (RT-PCR). The National Rapid Response Team (NRRT) investigated all reported cases. The Institute of Epidemiology, Disease Control and Research (IEDCR) & National Influenza Centre (NIC) has taken the lead role in conducting preliminary laboratory investigation with Real Time-PCR (RT-PCR) of nasopharyngeal or pharyngeal swab and confirming the diagnosis. A close contact was defined as a person who lived with or was exposed to the respiratory secretions or other bodily fluids of someone with suspected or confirmed infection. Patients were followed until discharge, with symptoms and signs recorded daily. The details of all

investigations and treatments were recorded. A return to normal body temperature was defined as a temperature of less than  $99^{\circ}\text{F}$  for 12 hours after the withdrawal of any antipyretic treatment. The criteria for discharge (as defined in the guideline) were two readings of normal body temperature taken on 2 consecutive days, the absence of respiratory symptoms, and negative results on the testing of samples from two consecutive pharyngeal or nasopharyngeal swabs.

#### Results

Out of our 28 indoor patients, 19 (67.85%) were female and only 9 (32.14%) were male patients. Age distribution of indoor patients varied from  $<10$  to 60 years. Maximum numbers of the patients were in the age group of 21-30 years (39.28%).

**Table I**

*Presenting symptoms and signs of indoor patients (n=28)*

Symptoms	Number (n)	Percentage (%)
Rise of temperature	26	92.85%
Rhinorrhea	20	71.42%
Sore throat	15	53.57%
Cough	18	64.28%
Shortness of breathing	25	89.28%
Wheezing	7	25%
Vomiting	9	32.14%
Diarrhoea	2	7.14%
Fatigue	10	35.71%
Myalgia, arthralgia	12	42.85%
Headache	8	28.57%
Altered mental status	1	3.57%
Restless	2	7.14%
Chill	2	7.14%
Haemoptysis	1	3.57%
Chest pain	1	3.57%
Less fetal movement	1	3.57%
Nasal congestion	15	53.57%
Conjunctival congestion	2	7.14%

Table-II shows all indoor patients were treated with cap. Oseltamivir. Among them only 2 (7.14%) patients died from respiratory failure.

**Table-II**

*Clinical outcome of indoor patients (n=28)*

	Number (n)	Percentage (%)
Oseltamivir given	28	100%
Death	2	7.14%

In our outdoor (Flu corner) at Dhaka Medical College Hospital (DMCH), 2335 registered suspected H1N1 influenza cases were attended but 833 highly suspected cases were recorded in case record form (CRF). They were all enlisted, registered, thorough histories were taken and clinical examinations were done. Suspected cases were sent to IEDCR for PCR from nasopharyngeal swab to detect Influenza A H1N1. Confirmed and admissible cases were admitted in Flu ward of DMCH. Subsequent follow up of the outdoor patients was not possible, because many of them did not report to us for further follow up.

Table III shows, among 833 outdoor patients 611(73.34%) were male and 222(26.65%) were female. Most patients are in between 20-24 years age group, where out of 311 (37.33%)

patients 247 (29.65%) were male and 64 (7.68%) were female. Next most populated group was 25-29 years age group, where a total patient was 144 (17.28%). Out of 833 outdoor patients, 354 (42.49%) patients were student, 195 (23.40%) were service holder, 92 (11.04%) were businessman, 84 (10.08%) were house wife, 30 (3.60%) were children and only 3 (0.36%) were farmer.

Table IV shows, between the age group of 20-29 years total patients were 455(54.62%) among them 17 patients had history of contact abroad and 51 patients had contact with flu patients. Out of the 833 patients, 596(71.54%) patients had fever, 410(49.21%) had cough, 314(37.69%) had sore throat.

**Table-III***Age and sex distribution of outdoor (flu corner) patients (n=833)*

Age group	Number (%)	Gender	
		Male (%)	Female (%)
0-4	11 (1.32)	4(0.48)	7(0.84)
5-9	20 (2.40)	11(1.32)	9(1.08)
10-14	29 (3.48)	13(1.56)	16(1.92)
15-19	131 (15.72)	91(10.92)	40(4.80)
20-24	311 (37.33)	247(29.65)	64(7.68)
25-29	144 (17.28)	113(13.56)	31(3.72)
30-34	69 (8.28)	49(5.88)	20(2.40)
35-39	43 (5.16)	23(2.76)	20(2.40)
40-44	32 (3.84)	26(3.12)	6(0.72)
>44	43 (5.16)	34(4.08)	9(1.09)
Total (%)	833 (100%)	611 (73.34)	222 (26.65)

**Table-IV***Epidemiological profile & clinical outcome of outdoor reported patients at Flu corner of DMCH (n=833)*

Age	Number (%)	Contact abroad	Contact with flu patients	Family member affected	Fever	Rhinorrhoea	Sore throat	Cough	Shortness of breath
0-9	31(3.72)	0	2	5	23	16	8	24	4
10-19	160(19.20)	3	12	9	128	74	65	128	39
20-29	455(54.62)	17	51	21	321	222	170	305	101
30-39	112(13.44)	5	10	9	75	60	45	79	31
40-44	32(3.84)	3	2	4	21	20	16	27	9
>44	43(5.16)	5	1	3	28	18	10	22	10
Total	833	33	78	51	596	410	314	585	194
(%)	(100%)	(3.96)	(9.36)	(6.12)	(71.54)	(49.21)	(37.69)	(70.22)	(23.28)

Table V shows out of 883 patients of flu corner only 57 (6.45%) confirm or suspected patients were given drug Oseltamivir and rest of the 776 (93.15%) patients were treated with conservative approach.

**Table-V**  
*Treatment given at Flu corner (n=833).*

	Number (n)	Percentage (%)
Oseltamivir given in Flu confirm and suspected cases	57	6.45%
Conservative treatment given	776	93.15%

### Discussion

We describe a study of 28 indoor patients and 883 outdoor patients at Flu ward and Flu corner of DMCH for 2009 pandemic influenza A (H1N1) virus infection between August and November 2009. As compared to the recent study of Dr. Bin cao, our majority groups of patients were also in between 21-30 years of age group.<sup>13</sup> In indoor patients group maximum patients were female (67.85%) but in outdoor patients group maximum patients were male. Among 833 outdoor patients 611(73.34%) were male and 222(26.65%) were female. Most patients are in between 20-24 years age group, where out of 311 (37.33%) patients 247 (29.65%) were male and 64 (7.68%) were female. Male preponderance was also reported by other studies.<sup>8,9,13,14,15,16</sup> Out of 833 outdoor patient, 354 (42.49%) patients were student, 195 (23.40%) were service holder and 92 (11.04%) were businessman. The patients, most of them previously healthy, had an influenza-like illness that progressed during a period of 5 to 7 days. Fever was the predominant symptom in this study both in indoor (92.85%) and outdoor patients. Komiya et al found fever in 89.5% of the cases; Roelio et al found in 100% of cases and also found as a major feature in other studies in China, United States.<sup>8,9,14,15,16</sup> Beside fever, cough, rhinorrhea and shortness of breath were the most common features which is compatible with the all other studies.<sup>8,9,15,16</sup> The incidence of nausea, vomiting, and diarrhea was also much lower in our study and previously reported study.<sup>8,9,15,16</sup> In our indoor patients maximum recorded temperature in most of the cases was 101 to 101.9 °F, which is also found in other studies.<sup>11,15</sup> In our study of indoor patients fever persisted for 1 to 8 days, which was 1 to 11 days in Bin Cao study.<sup>13</sup> In Bin Cao study median duration of fever was 3 days which was 2 days in our study.<sup>13</sup> Among outdoor patients between the age group of 20-29 years total patients were 455(54.62%) among them 17 patients had history of contact abroad and 51 patients had contact with flu patients. Out of the 833 patients 596(71.54%) patients had fever, 585(70.22%) had

cough, 410(49.21%) had Rhinorrhea and 314(37.69%) had sore throat. These features are also common in other studies worldwide.<sup>14,15,16</sup> In our indoor study 9(32.14%) cases were PCR positive for H1N1. In other study, positive cases were much more compared to us, which is possible because they did PCR daily or every alternate day but in our hospital admitted patients we did it for single time as this test is very expensive and it was not possible for our Government to bear the cost of repeated tests. Oseltamivir was given in 100% indoor patients and only 6.45% of outdoor patients. Dealing of such a pandemic in a low-resource setting like Bangladesh it would be very difficult task for us. But we have done a great job because with these limited resources only 2 patients had died. Among outdoor patients only 6.45% positive or highly suspected patients were treated with Oseltamivir and rest of them only conservatively.

Most cases can be dealt at home by following measures like social distancing, respiratory “etiquette”, hand hygiene and household ventilation.<sup>17</sup> In health-care settings, a system of triage, patient separation, prioritization of use of antiviral medicines and personal protective equipment (PPE) according to risk of exposure, and patient management should be in place.<sup>17</sup> A particular vulnerable group is the pregnant women who have an increased probability of developing complications compounded by the fact that maternal health care is often neglected in these low income countries.<sup>3</sup> In our indoor patients 3 of them were pregnant but there ultimate outcome were good. The Government of Bangladesh (GOB) has taken appropriate measures in combating this pandemic. Screening of passengers at airport, seaport and land ports has begun. Antiviral drugs and PPE have been stockpiled up to the district levels. Isolation units at 29 district hospital have been setup and by the end of the year all district hospitals will have this facility ready. At the national level, National Institute of Chest Disease Hospital (NIDCH) and Infectious Disease Hospital is prepared to manage emergency. Adequate numbers of health professionals have been trained on influenza epidemic.<sup>18</sup>

### Conclusion

Influenza pandemic is not a new phenomenon to the world. Proactive measures rather than panic are warranted in dealing with this problem of global scale. So far we have been able to control our part of this pandemic quit satisfactory. The number of cases and casualties is well within the tolerable range. We ensure that this remain as good as it is now we have to keep up the vigilance and modify the measures well in time to overcome new situations.

**Conflict of interest:** None

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