

## Investigation on Outbreak of Influenza Like Illness Amongst the Cadets and Recruits of Two Military Institutions of Chattogram

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### ABSTRACT

Seasonal epidemics of Influenza Like Illness (ILI) can be caused by both Influenza A and B virus, which can affect the community in a large scale. The authority of BMA (Bangladesh Military Academy) and AC&S (Artillery Centre & School) noticed the outbreak of febrile illness amongst the residential cadets and recruits. An investigation was carried out for this outbreak to identify disease, mode of transmission and to suggest control measures. Individuals with fever (>100°F) and cough or sore throat were Influenza Like Illness (ILI) case patients from 31.3.2019 to 14.4.2019. We collected histories and specimens from hospitalized case patients and visited campus to explore environmental context. Total 202 (21.2%) cases in BMA and 251 (21.3%) cases in AC&S were identified amongst the residential cadets and recruits. Nasal and oropharyngeal swabs from 18 patients were positive for influenza B virus using real-time reverse transcription polymerase chain reaction (rRT-PCR). Overcrowding likely facilitated transmission leading to this dormitory outbreak.

**Key words :** Influenza; Illness; Fever; Cough; Sore throat.

### Introduction

Influenza causes outbreaks in a broad range of settings including hospitals, schools, long-term care or training centers and other confined settings<sup>1</sup>. There are 4 types of seasonal influenza viruses, types A, B, C and D, amongst them influenza A and B viruses circulate and cause seasonal epidemics of disease<sup>2</sup>. Influenza A and B viruses are very contagious and can spread from person to person by droplets from the cough or sneeze of an infected person. In 2018, researchers also confirmed that the virus can spread just by breathing, through small particles called aerosols. Other research has found that such infectious particles can travel up to six feet after they are exhaled by a sick person<sup>3</sup>.

The flu (Short for influenza) is a respiratory virus that affects the throat, nose, bronchi and, sometimes, the lungs. For most people, the flu is an inconvenience that subsides in a few days. For others, influenza can lead to health complications, visits to the hospital and even death. BMA and AC&S are two military training institutions for the cadets and recruits respectively. An epidemic outbreak of viral fever occurred in AC&S and BMA of Chattogram area from March 2019 to May 2019.

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### Case Report

On 31<sup>st</sup> March 2019 BMA informed the higher authority that there were a sudden onset of Influenza Like Illness (ILI) amongst the cadets. The suspected index case was a 20 years old male Cadet in BMA. On 27<sup>th</sup> March he reported to OPC Bhatia with the chief complaints of fever with chills, runny nose, cough and severe muscle ache. On physical examination patient was ill looking, temp 102°F with general weakness. Onwards cases were reporting with the similar complaints. On the other hand, in AC&S a large number of recruits were reporting with ILI symptoms since 31<sup>st</sup> March. Of the 948 officers' cadets living in BMA, 202 (21.2%) cases were found and out of 1181 recruits of AC&S, the frequency was 251(21.3%). A sudden rise in influenza like illness started on 31<sup>st</sup> March 2019 on both training institutions. Higher ILI incidence during 31<sup>st</sup> March to 9<sup>th</sup> April, 2019, as compared to preceding daily average rates (In BMA 13 vs 4 patient visits/24 h and in AC&S 23 vs 6 patient visits/24 h) were noticed confirming outbreak.

All cases were male in AC&S, between 18 to 20 yrs with mean age  $18.5 \pm 1.04$  yrs and in BMA it was between 18 to 22 yrs with mean age  $19.5 \pm 2.02$  yrs. No death was reported. Symptoms associated with fever were cough 37(60.8%), running nose 23(25.2%), myalgia and body ache 11(12%) and few other symptoms of generalized weakness and dysphagia. Frequency of cases reached peak on 5<sup>th</sup> April 2019 then declined to pre outbreak level on 14<sup>th</sup> April 2019. On both institutions, the cases were interviewed by pre-formed proforma to collect information on travel history, contact with similar cases before onset of disease and clinical examination was also done. Environmental conditions such as lighting, ventilation, overcrowding, sanitation and humidity in the accommodation areas were also examined.

**Table I** : Distribution of study subjects

Traits	BMA (n=948)	AC&S (n=1181)
Cases with ILI	202(21.2%)	251(21.3%)
Age (m±sd)	19.5±2.02	18.5±1.04
Avg patient visit/24 h (Between 31 <sup>st</sup> Mar-9 <sup>th</sup> Apr 19)	13	23

Blood samples (5 ml) were collected for viral serology and blood cultures, from suspected cases having recent onset of fever. Authority informed the IEDCR (Institute of Epidemiology, Disease Control and Research) about the unusual events of fever and cough among the cadets and recruits of BMA and AC&S. An outbreak investigation team from IEDCR conducted the investigation. Line listing was done according to developed case definition and a total 99 ILI cases were enlisted including 6 female cadets. 24 ILI cases were recorded from BMA and 75 cases from AC&S, Haliashahar, Chattogram. Respiratory samples (Nasopharyngeal and throat swabs) and sputum were also collected. Samples were analyzed at virology laboratory of IEDCR. A total of 24 samples were processed. RT-PCR for influenza from nasal and throat swab and Multiplex, PCR for FTD 33 Respiratory pathogens from sputum were performed. Eighteen samples (75%) were positive for seasonal influenza B. Two samples (8%) were positive for H. Influenzae. However, all the samples were negative for Influenza A H1N1.

Incubation period of Influenza B in the present outbreak was short (Few hours to three days). In previous studies, the typical incubation period for influenza of 1 to 4 days, with an average of 2 days has been reported<sup>4</sup>.

Heavy rains followed by excessive heat before outbreak leading to humid conditions in training area facilitated person to person transmission of Influenza B may be by droplet infection/nuclei created by sneezing, coughing and talking.

#### Treatment

Control measures were employed from the day of outbreak notification. Influenza is usually self-limiting in healthy individuals. Treatment of uncomplicated disease in healthy individuals is supportive and staying off work or school until 24 hours after resolution of fever to limit spread to others<sup>5</sup>. In both institutions patients were given supportive management which includes antipyretics, antihistamine, cough suppressants, adequate fluid intake and rest. No antibiotics were given but patients were advised to take citrus fruits to enhance immunity. Patients were kept in isolation room for 5-7 days until they were afebrile to prevent person to person transmission. Health education program were intimated amongst the cadets/recruits which includes, awareness among trainees about the present outbreak, precautionary measures (Hand hygiene, cough etiquettes), case finding and placing patients on sick leave to prevent future occurrences.

#### Discussion

The outbreak of influenza B virus is a seasonal disease. The season starts in April and ends in September. Globally, 5-10% of adults and 20-30% of children get the flu each year and 3 to 5 million of these cases are severe, leading to about 250,000 to 500,000 deaths, according to the WHO (2018). In the United States, there were an estimated 80,000 deaths and 900,000 hospitalizations from flu during the 2017 to 2018 flu season, making it the worst flu season in at least four decades, according to the Centers for Disease Control and Prevention (CDC). Sudden onset of ILI occurred in a dormitory student residents of a religious school of northern Bangladesh in 2011, where 47% of the residents reported ILI in less than a week, represented explosive transmission in the dormitory<sup>6</sup>. In our case study we observed the institutional respiratory outbreak of viral influenza with high attack rate. The natural history and transmission of the influenza B virus in a closed training center appeared in our study is found to be similar to those of previously observed epidemic outbreak reports of influenza viruses.

#### Conclusion

Seasonal influenza, caused by influenza B virus is highly contagious. Though it is a self-limiting disease but special care should be given to high risk group. During the influenza season, necessary precautions should be taken to limit the spread of the disease in overcrowding places. Emphasis on infection control measures should be given to the closed settings e.g school with dormitory, residential training centers, hospitals, long term care centers etc. to decrease the morbidity.

#### Disclosure

Both the authors declared no competing interests.

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