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Prevalence of Influenza A (H1N1) Virus among the Pediatric Population in A Tertiary Care Hospital, Hyderabad during the Year 2017(Feb-Nov)

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Abstract: Influenza A H1N1 virus emerged as pandemic worldwide in 2009 and its re-emergence has taken place in India in 2013.As Influenza A H1N1 is a newly mutated influenza strain, conventional anti-influenza vaccines and anti-viral drugs have not found to be effective. Oseltamivir and Zanamivir are the only Influenza A H1N1 antiviral drugs available, which are used both for prophylaxis and treatment. The present study is a prospective study conducted from the month of February 2017 to November 2017, among pediatric age group. The samples were tested by Real-Time PCR using CDC recommended reagents and protocol for confirmation of the H1N1 novel influenza virus. Out of 423samples processed by RT-PCR, a total of 40 samples (9.4%) were positive for influenza A (H1N1) virus. It is observed that influenza type A (H1N1) virus is prevalent in Hyderabad among pediatric group during the study period. Therefore surveillance data are important in the early detection of infection that may be helpful in global influenza vaccine preparation and for any pandemic preparedness activity.
Keywords: Influenza A (H1N1), RT-PCR, Oseltamivir, Hyderabad, Pediatric, surveillance.

INTRODUCTION

Influenza viruses have the potential to cause contagious respiratory illness ranging from mild flu to severe respiratory illness resulting in death [1]. Pandemic H1N1 (pH1N1/2009) virus appeared in first quarter of 2009 in the west coastal region of North America and spread very rapidly to other countries through April to June, 2009[2].

The World Health Organization (WHO) formally declared the pandemic (Phase 6) on 11 th of June, 2009[3]. The first case of pandemic influenza in India was reported from Hyderabad in May 2009[4]. After that the virus soon became endemic and spread to almost all major cities in India. Outbreaks of swine flu are common and cause significant economic losses.

WHO requested all member countries to continue surveillance measures, since pandemics are unpredictable in nature and H1N1 virus may circulate along with other seasonal type of influenza virus[5].The objective of any surveillance program would be to detect change in age distribution of H1N1 illnesses and severity and its impact over hospitalization and mortality. The aim of this study was to report the findings of influenza virus surveillance in patients attending Niloufer Hospital, women and child tertiary care hospital Hyderabad, Telangana and to document the clinical and epidemiological data of influenza viruses.

MATERIALS AND METHODS

Patients reporting to Niloufer hospital with ILI symptoms who received medical care as outpatients or inpatients in the hospital throughout the epidemic wave were referred to Department of Microbiology in Niloufer hospital. Nasal/Throat swabs were taken in VTM after collecting relevant clinical information and epidemiological information such as age, gender, underlying disease, travel history, close contact with confirmed case etc, from the patient. RNA was extracted using QIAamp viral RNA Mini Kit (applied biosystems, incell technologies, Banglore) and Real time RT-PCR was used for clinical confirmation of the presence of pH1N1, and Influenza A viruses in the collected samples usingspecific probes and primers (TaqMan® Universal PCR Master Mixand H1N1

influenza A MGB Assay [Set 1 and 2], Applied Biosystems, incell technologies, Banglore) on a ABI 7500 cycler (Applied Biosystems, incell technologies banglore) at Institute of Preventive Medicine, Hyderabad. The Influenza A positive, but pH1N1/2009 (specific HA gene primer) negative samples were further subtyped for seasonal H1N1.

RESULTS

During the study period (February 2017 to November 2017), respiratory samples were collected from 423 patients with symptoms of influenza-like illness. Out of 423samples processed by RT-PCR, a total of 40 samples (9.4%) were positive for influenza A (H1N1) virus

Table-1: Age wise distribution

	0-2	2-14	Adults(women)	total
Positive(h1n1/2009)	29	10	01	40
Negative(h1n1/2009)	283	77	23	383
total	312	87	24	423

Chart 1

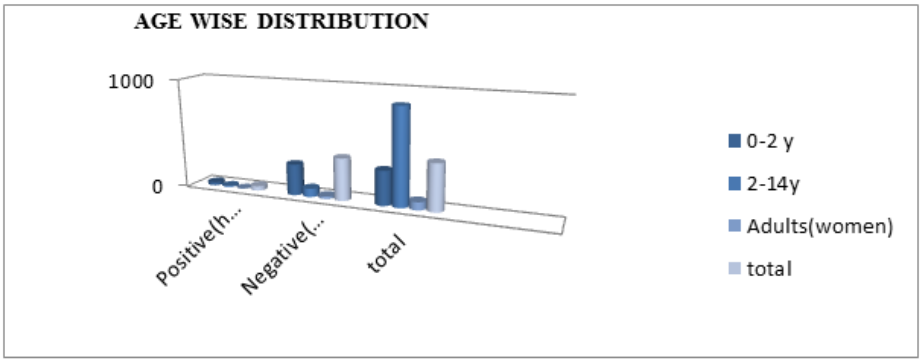

Table-2: Details of influenza A

age	Human infA			Swine infA			Swine infH1		
	Positive	Negative	Total	Positive	Negative	Total	Positive	Negative	Total
0-2Y	29	283	312	29	283	312	29	283	312
2-14Y	10	77	87	10	68	78	10	77	87
Adults(women)	1	23	24	1	23	24	1	23	24
total	40	383	423	40	383	423	40	383	423

Table-3: Clinical conditions of ILI patients

Clinical symptoms	n (%)
Fever	98%
Cough	85%
Sore throat	59%
Dyspnea	42%
Running nose	21%
Myalgia	25%
Wheezing	12%
Nasal congestion	37%
Headache	14%
Gastrointestinal symptoms	2%

DISCUSSION

The 2009 swine flu pandemic is a global outbreak of novel H1N1 strain and was first recognized in the state of Veracruz, at the border between Mexico and United states in April 2009, and during a short span of two months became the first pandemic of the 21st century. This outbreak involved more than 170 countries spread over all the continents with more than one lakh affected people [6]. The reason for the rapidity of spread is because many people have mild symptoms and never seek treatment and those who get treatment don't officially get tested and many times it is only the hospitalized patients who get tested [7]. In India the pandemic has spread quite rapidly with more than 2,000 confirmed cases equally affecting both sexes with 25 deaths in the initial phase of the epidemic itself. Children and Young adults were commonly affected

and nearly 40% of those affected have been children less than 14 yrs[8].

During the study period (February 2017 to November 2017), respiratory samples were collected from 423 patients with symptoms of influenza-like illness. Out of 423samples processed by RT-PCR, a total of 40 samples (9.4%) were positive for influenza A (H1N1) virus. which correlates with following studies. Of the total 2065 suspected cases in Sitanshu Sekhar Kar *et al*. (9.5%) cases were positive for H1N1[9]. During the period of epidemic from August 2009 through January 2010, P. Sriram *et al.* [10] cases were screened for swine flu. Out of which 79 (18.6%) were positive [10].

During the study period of Ganesh Nandhini et al May 2009–December 2013 respiratory samples were collected from 2247 patients with symptoms of influenza-like illness 287(12.7%) were positive[11]. During June 2009 to July 2010, a total of 2971 samples were tested. PCR analysis revealed that 382 (12.86%) samples were Influenza A positive Anupam Mukherjee *et al*. [12]. Age-wise analysis of positive cases per total number of samples screened revealed that, maximum positivity for pH1N1 viruses belonged to the age group of 0-2 years which correlates with Anupam Mukherjee *et al*. [12], Carrie Reed *et al*. [13] P. Sriram *et al*. [10].

In our study, the contribution of influenza to ILI was approximately 24% which corroborates several reports from all over the world [14-16]. The predominant type of influenza A virus in this study was pandemic influenza A (H1N1) 2009. This finding is consistent with other reports from Delhi and Lucknow [17, 18]. However, contradictory reports of increased seasonal influenza A (H3N2) have been reported from China during the same period[19].

Mortality rate of influenza A (H1N1) 2009 infection was 1% and similar scenario was observed in state of Kolkata (1%) and it is lower than reports from Gujarat (19%), Brazil (11%)[20-22]. Low mortality rate could be because of timely admission, immediate initiation of Oseltamivir prophylaxis in the suspected cases and surplus availability of Oseltamivir due to the awareness created by the pandemic. Oseltamivir is the oral anti-viral drug for the treatment of influenza A and B viruses and sporadic cases of Oseltamivir resistant swine influenza A (2009) have been reported since 2009.

CONCLUSION

The present study reflects post-pandemic H1N1 data based on an analysis of suspected cases of ILI at a tertiary care, academic centre located in South India. We observed 9.4per cent lab positivity among suspected cases tested for Influenza pandemic H1N1 strain tested using RT-PCR technique in the post pandemic period. Therefore surveillance data are important in the early detection of infection that may be helpful in global influenza vaccine preparation and for any pandemic preparedness activity. If you have the flu, you can help stop the spread of this infectious disease by staying home while you are sick and by covering your mouth and nose as you cough or sneeze.

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