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Prevalence of H1N1 in and around Hyderabad during pandemic and post pandemic period

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Abstract

Background & Objectives: Pandemic H1N1 spread 74 countries and prompted World Health Organization to raise alarm label it as phase 6. The present study was conducted on throat and nasal swab samples received and tested at IPM Hyderabad, India during 2009-2011 to collect information on positive cases. **Materials and Methods:** Throat and nasopharyngeal swabs from influenza A H1N1 patients who were clinically diagnosed during august 2009-September 2011 along with their clinico-epidemiological details were collected from identified hospitals from Andhra Pradesh and other neighbouring States. Samples were tested by Real time reverse transcriptase PCR. **Results:** A total of 6805 samples, both throat and nasal swab samples from each patient were tested for H1N1 influenza virus, of which, 1329 (19.5%) were positive for pandemic influenza A H1N1, comprising 41.1% males and 44.13% females. 11.52% were below 5yrs age. **Interpretation & Conclusions:** The study showed a peak of cases of pandemic influenza A H1N1 in august 2009 and indicated predominance of H1N1 positive cases (19.5%) in clinically suspected group. So prompt steps should be taken in case of pandemics to contain the spread of disease and lower the load of mortality and morbidity due to pandemics.

Keywords: H1N1, Influenza A, Pandemic, IPM, FLU.

Introduction

As it's a known fact that a Respiratory infection caused by influenza virus is major cause of concern due to its high mortality and morbidity, worldwide annually 250000 to 500000 deaths occur due to influenza.[1]

An unusual increase in the number of influenza-like illness cases was detected in Mexico starting at the end of March 2009 which was found to be caused by influenza virus H1N1 which spread to different countries. Later in the year, WHO (World Health Organization) declared H1N1 as pandemic in June 2009 which originated from Mexico.[2] In India, the first case of influenza A H1N1 was reported on May 16, 2009 India confirmed its first case on 16 May 2009, when a man travelling from New York via Dubai and Delhi tested positive for the H1N1 Influenza virus in Hyderabad.[3]

The Novel H1N1 caused serious fatal infection in normal individuals but Pregnant women, younger children and people of any age with certain chronic lung or other medical conditions appear to be at higher risk of more complicated infection or fatal out come.[4]

In view of severity of pandemic Developing countries were declared more likely to be

at risk from the pandemic effects, as they faced the dual problem of highly vulnerable populations and limited resources to respond to H1N1.[4]

Diagnosis of the 2009 H1N1 virus is confirmed by a qualitative positive RT-PCR (reverse transcriptase polymerase chain reaction) test from a properly obtained nasal and/or throatswabs.[5] Present study was conducted on samples received and tested at Institute of Preventive Medicine, Hyderabad during the pandemic H1N1.

Materials and Methods

NCDC has trained 3 Members of our staff in diagnosing human influenza A H1N1 by RT PCR in June 2009. After undergoing training, IPM has established the lab for diagnosing H1N1 samples for AP state. Testing was started from 18th august 2009. It was our first experience to handle such a big epidemic with advanced method of testing such as RT PCR. We have not faced many problems during the peak duration of the Epidemic. All the staff of IPM was involved in the complete work of testing right from sample receiving to processing and report displacement. We have handled the epidemic successfully. We have been helped by one institute "bioserve" by utilizing there PCR Machine during the peak of the epidemic. We have communicated the results through the phone call, SMS and Email services, to the concerned clinician within 24 hours of receiving the sample. We were processing the samples with 48 wells RT PCR Machine .To be on time we were running the tests day and night .We were appreciated for the work done and this was shown in the form of E Governs awards.

Throat swabs and nasal/nasopharyngeal swabs collected by clinicians in virus transport medium (VTM) from patients exhibiting influenza like symptoms were received at the designated reference laboratory in triple packaging cold conditions from all over the country. Samples were accompanied by duly filled pro forrma with demographic characteristics, date of symptom onset, co-morbidities, travel/contact history, antiviral treatment, etc. Initially, all samples were collected before administration of antiviral therapy. All the respiratory specimens were processed in BSL (Bio Safety Level)-3 labs within 2-3 hours of receipt of the samples.

RNA isolation was done in these samples using QIAmp® Viral RNA Mini Kit or RNeasy® Mini Kit from Qiagen, USA. Reverse transcription and amplification of the target genes was carried out by real-time RT-PCR using CDC real-time RT-PCR protocol for detection and characterization of Swine Influenza (version 2009).[6] Primers and dual labeled probes were procured from CDC and SuperScriptTM III Platinum® one-step quantitative RT-PCR kit from Invitrogen, California, USA, was used. One-step quantitative RT-PCR probe hydrolysis (TaqMan-ABI) package kit with Agpath-IDTM and one-step RT-PCR kit supplied by Applied Biosystems-Ambion, USA, were also used later. In each sample, four target genes were amplified: Influenza A, Swine Influenza A, Swine H1 and RNaseP. A sample was declared positive when it showed amplification in all four target genes. One hundred fifty positive patients belonging to different age groups were selected for the study. Repeat samples for these patients under antiviral treatment, as per the guidelines laid down by the Government of India, were collected and tested everyday till no amplification for three specific target genes of the virus was seen on two consecutive days.[5-7]

Results

All the cases reporting to the IPM Influenza A H1N1 screening center in Hyderabad were 6805 from various institutes which were clinically diagnosed to have H1N1 influenza infection during period of 2 years i.e. from August 2009 to September 2011.

Out of 6805 specimens, 1329 were positive for H1N1 by RT-PCR. Out of 1329 positive cases 51.71% were females & males were 48.30%. Year wise distribution of cases were as follows (table 1 to table 3)

Table 1: Note on Influenza A (H1N1) (Swine Flu) on 17-08-2009 to 31-12-2009

Month	No. of Samples Tested	No. of Samples Positive	No. of Samples Negative
17th Aug to 31st Aug 09	177	57	120
Sep-09	1273	432	841
Oct-09	929	92	841
Nov-09	166	6	160
Dec-09	76	8	68
Total	2621	594	2027

Table 2: Influenza A (H1N1) Analysis Report -2010

S. No.	Month	No. Samples Tested		
		Total	Positive	Negative
1	January	43	2	41
2	February	33	2	31
3	March	22	3	19
4	April	44	2	42
5	May	19	1	18
6	June	107	25	82
7	July	511	153	358
8	August	1637	395	1242
9	September	833	125	708
10	October	224	19	205
11	November	90	1	89
12	December	35	0	35
	Total	3598	728	2870

Table 3: Influenza A (H1N1) Analysis Report - 7th Sep 2011

S. No.	Month	No. Samples Tested		
		Total	Positive	Negative
1	January	40	2	38
2	February	37	0	37
3	March	9	0	9
4	April	7	0	7
5	May	6	1	5
6	June	10	1	9
7	July	20	1	19
8	August	58	1	57
9	September	39	1	38
	Total	226	7	219

22.66%H1N1 cases confirmed by RT-PCR in 2009, 20.23% H1N1 during year 2010 and 3.09% of H1N1 cases were diagnosed till September 2011 (Figure 1).

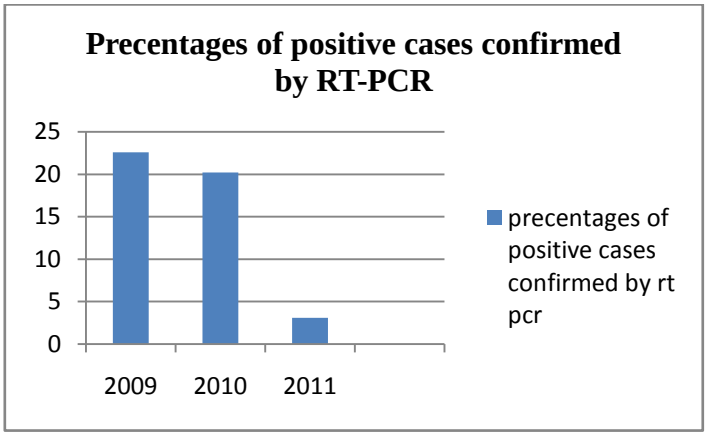

Figure 1: Percentage of cases confirmed by RT-PCR from June 2009 to September 2011

Discussion

All the cases from August 2009 to September 2011 reporting to the Influenza A H1N1 screening center IPM in Hyderabad were diagnosed by RT-PCR. We at IPM found 19.5% of H1N1 from suspected cases. Male and female were almost equally affected. Outbreak caused by the novel Influenza 2009 A/H1N1 virus infection, which had spread rapidly with a potential to be a major pandemic - the novel virus is anti-genically distinct to other seasonal flu viruses because of its rapid spreading nature needs prompt surveillance to contain it. The Control of pandemic depends on the ability to quickly diagnose and share virologic, epidemiologic, and clinical information from emeging new cases. Isolation of suspected cases from other patients in hospitals, adequate measures such as use of mask and proper hand wash during outbreaks is a simple but very helpful precaution that can prevent further spread of disease.

The severity of illness among influenza A (H1N1) infected patients was associated with delayed referral from general practitioner/physician, duration of antiviral treatment, and presence of coexisting condition, especially pregnancy. These findings may be different during the future waves, owing to the timely deployment of an effective vaccine, to viral mutation, and resistance to antiviral drugs. Vaccination remains important as a means of reducing the morbidity and mortality caused by influenza viruses, and it strongly recommends vaccination of high-risk individuals in countries where influenza vaccines are available.[8-11]

Limitation

Our study had some limitations. As ours is a government notified diagnostic centre for detection of H1N1 so most of the samples were referred from different hospitals and diagnostic centers across the state, clinical data and other investigation data were not fully available to include in study. Therefore, patients who were infected in the community and did not go to the hospital were also not included in our study. All diagnostic testing was clinically driven, and there was no standardized tool for procuring other investigations. Despite the use of a standardized requisition form, not all information was sent with patient's sample.

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