



Novel (H1N1) Pandemic Influenza in Pediatric Patients : A Tertiary Care Center Study

KEYWORDS

Novel (H1N1), Pandemic influenza, Pediatric.

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ABSTRACT Background: The positive case of novel influenza A virus was reported first in Mexico in March 2009 & then World Health Organization (WHO) announced a pandemic, raising alert level of Phase 6 in short duration of 3 months due to worldwide spread of virus like storm. India too reported Index case in May 2009 of Novel influenza also known as Mexican Flu. Occurrence of flu was noted across globe but Indian studies especially of clinical profile of Novel flu in pediatric age group are sparse. So present analytical study was undertaken. Material & Method: Retrospective analysis study of Pediatric cases, examined for occurrence of Swine flu with other demographic features. Result: Total suspected cases examined -157, Positive- 9, Death -1. Conclusion: Younger male patients were predominantly affected. As data comes from Epicenter of Indian Epidemic, adds valuable insight for future planning of any such outbreaks.

INTRODUCTION:

After the detection of Index case from India, amid lot of panic detection of Novel H1N1 infection was undertaken. Pune was the epicenter of this pandemic & First death was also reported from pune.⁽¹⁾ our hospital a tertiary care center from Pune did receive cases of suspected swine Flu in High Number. The strain of Virus was result of triple reassortment containing genes from Avian, Human, Swine Influenza viruses. ⁽¹⁾ The Gene segment Pb2 & PA from Duck influenza virus passed to Swine influenza virus in 1968. PB gene segment from duck transferred to human virus as well to swine influenza virus. ⁽¹⁾ The Pandemic Influenza virus has the expression of all three genes. ⁽¹⁾.Influenza virus which is an enveloped RNA virus of the Orthomyxoviridae family is having potential for genetic variation dependant on following characteristics.(i) The segmented genome, with eight RNA segments that are genetically independent of each other (ii) a high rate of mutation, in the surface haemagglutinin (H) and neuraminidase (N) proteins. These properties along with the ability of the virus to spread infection in a wide host range of humans, domestic animals and avian makes it a potential pandemic agent.⁽²⁾ Domestic pigs and birds being in close vicinity to humans pose a threat for the occurrence of mixed influenza infections. Pigs and birds also provides a niche for the generation of reassortment of viruses and initiates influenza pandemics.⁽²⁾ The novel influenza (Mexican) triple-reassortant virus is itself a combination of haemagglutinin (HA), nucleoprotein (NP), and nonstructural protein (NS) genes, originating from classic swine influenza A viruses; the polymerase PB2 (PB2) and polymerase (PA) genes from avian influenza viruses from the North American lineage; and the polymerase PB1 (PB1) gene from human influenza A viruses .The largest proportion of genes in this novel virus comes from swine influenza viruses (30.6 percent from North American swine influenza strains, 17.5 percent from Eurasian swine influenza strains), followed by North American avian influenza strains (34.4 percent) and human influenza strains (17.5 percent) ⁽²⁾.It is unique genetic combination of influenza virus segments had not been seen before.

Human being were not having the immunity to this virus & Younger age group especially children were vulnerable to attack due to Virus. ^(1,3) The salient features of the strain of Influenza 2009 A/H1N1 virus is the high efficiency of human-to-human transmission. This probably explains the alarming spread of the virus across the globe in a very short time and pandemic threat.^(1,2) Studies are available but in combination with adult patients. So this retrospective study was under-

taken in pediatric patients screened for Swine flu to know about demographic characteristic & positivity of novel virus.

MATERIAL & METHOD:

Electronic records of pediatric patients screened for Novel influenza virus were retrieved & analyzed for demographic characteristic accessible, like Positivity for infection, Age, Sex, month of collection of swab to establish the pediatric disease pattern. Total 163 records could be retrieved .These patient's nasopharyngeal swabs were collected in virus transport medium & sent to National Virology Institute Pune, for processing by Reverse transcriptase Polymerase reaction as guided by World Health Organization & CDC. As Influenza like illness can be mistaken for Novel Influenza Virus infection. Clinically it can be defined as follows.

Influenza like illness is defined as Fever (Temperature of 100° F/37.8°C) Or greater, Sore throat, in the absence of known cause other than influenza.^(4,5,9,10)

Case definition for reporting of Pandemic H1N12009 virus infection in humans: An Individual with Laboratory confirmed pandemic (H1N1) virus infection by one or more of the following.^(4,5)

1) Polymerase chain reaction 2) Viral culture 3) Fourfold rise in pandemic (H1N1) 2009 virus specific neutralizing antibodies.⁽⁴⁾

Table 1: Total screened cases & Positive & Negative results with Death.

Total cases screened	Positive Influenza cases	Death	Negative Influenza cases
163	9	1	154

Table 2: Seasonality of Novel Influenza Virus.

Positive cases	Month of collection
2	March
3	April
1	May
2	November
1	December

Table 3: Age of positive cases.

Number of Cases	Age in Month
1	17 days
1	4 month
1	5 month
2	6 Month
1	11 month
1	4 Year
1	6 Year

**Table 4: Gender distribution among positive cases.
*Data for gender for one positive case not available.**

Number of cases	Gender distribution
7	Male
1	Female

Discussion:

Age group involved in Novel H1N1 pandemic is variable worldwide.^(12,3,6) But Novel H1N1 influenza is supposed to affect younger age group predominantly. In this study too smallest age was 17 days & oldest one was 6 years. Although if pattern is seen, < 1 year patients were more affected, than, > 1 years. In combined Adult & pediatric age group study, < 10 year age group involvement was 5.26 %.⁽¹²⁾ Out of 57 confirmed cases 32 were male & 25 were female.⁽¹²⁾ The unique retrospective study done in pediatric patients from 12 countries showed median age in confirmed case was 6 year, when patient population admitted to 79 emergency departments in different countries was, 16 year.⁽⁸⁾ The same pediatric study did show male predominance in infection, out of 265, 151 were male (57%).⁽⁸⁾ Nevertheless adult study doesn't show any difference in male or female infection rates.⁽¹²⁾ Seasonal pattern in this study conspicuously depicts cases positivity in month of April & March & 2 cases in November, whereas adult study from Nagpur showed increased positivity rate in the month of September.⁽⁷⁾ The increased positivity rate was attributed to monsoon season & higher humidity. But pediatric only study of ours don't support this findings. Probable explanation could be children are more susceptible throughout the epidemic due to immature immunity. This study documented one death out of nine, with case fatality rate

of 11%, which is comparable to pediatric study involving 12 countries showing 10% mortality, Out of 265 death reported in 27 patients.⁽⁷⁾

Predisposing factors related to severe outcome in pediatric are tachycardia, presence of chest retraction, Sign of dehydration, low oxygen saturation, chronic lung disease, cerebral palsy or development delay.⁽⁸⁾ As not many pediatric studies are available & positivity in our study although comparable to international findings includes limited number & as data is retrieved from electronic record few findings were missing due to technical error of archiving it. It's too early to confirm the facts of demographic findings but it does suggest pediatric patients especially male & of low age group are more susceptible to novel H1N1 than other groups throughout the season.

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