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A Study of Clinical and Lab Profile of H1N1 positive Children at A Tertiary Care Hospital

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Abstract

Background: Only few studies regarding Influenza clinical and lab profile in children are present in India. This study was aimed to determine the clinical and lab profile and to study morbidity and mortality pattern in H1N1 positive children.

Methods: This was a hospital based prospective observational study, conducted between June 2018 to March 2019 in Sir Padampat Mother and Child Health Institute (SPMCHI), Department of Paediatric Medicine, SMS Medical College, Jaipur.

Results: Out of 132 H1N1 patients, maximum patients 71.97% were in between 0 – 5 years of age group. Other include 20.45% in between 6-10 yrs age group and 7.58% in >10yrs age group. Ninety four were males (71.21%) and 38(28.79%) were females. Case fatality rate in H1N1 was 3.03 %. Total number of survival cases were 128 (96.97%).

Conclusion: We concluded that the Influenza A (H1N1) was highly infectious disease in paediatric age group population. Influenza A(H1N1) was highly prevalent in under five year age group children with slight male preponderance. Fever, cough and coryza were the most common presenting complaints in H1N1 patients followed by shortness of breath which were in one third of H1N1 patients then diarrhoea, vomiting, sore throat and seizure less common. In majority of H1N1 patients total leucocytes counts and liver function test remained inconclusive. Chest radiograph were normal in more than two third of patients with H1N1 infection but manifest as bilateral lung involvement in severely ill patients who were at high risk.

Keywords: H1N1, Lung, Fever.

Introduction

Influenza commonly referred as the flu, is an infectious disease caused by RNA viruses of family orthomyxoviridae (the influenza viruses) that affects birds and mammals.[1] In children Influenza is one of the common infection that has high morbidity and mortality. During spring of 2009, a novel Influenza A(H1N1) virus caused acute respiratory illness in Mexico and then spread globally resulting in an influenza pandemic.[2]

In India first confirmed case of H1N1 was recorded in Hyderabad on May 16,2009. The total number of laboratory confirmed cases were 45101 and deaths were 2679 by October 2010.[3]

Influenza spreads through droplets from infected individuals while speaking, coughing and sneezing.[4] Influenza virus causes acute respiratory illness which is seasonal, mainly occurs in winter and also during monsoon season.[5-6]

Although the incubation period has not been established for pandemic H1N1 influenza A infection, it could range from 1to 7 days, and most likely from 1to 4 days[7]

Immunocompetent patients with pandemic H1N1 virus infection are likely to be contagious from 1day before development of signs and symptoms until resolution of fever. Longer period of shedding may occur in children (especially young infants), the elderly, patients with chronic illnesses, and immunocompromised hosts.[8]

Fever, headache, body aches, fatigue, diarrhoea, vomiting and upper respiratory symptom such as cough, running nose, and sore throat are the most common clinical features of swine Influenza A. Furthermore, sinusitis, otitis media, croup, pneumonia, bronchiolitis, status asthmatics, myositis, pericarditis, rhabdomyolysis, encephalitis, seizures, toxic shock syndrome, and secondary bacterial pneumonia with or without sepsis are expected as clinical complications of the existing pandemic H1N1 virus infection.[9]

Only few studies regarding Influenza clinical and lab profile in children are present in India. This study was aimed to determine the clinical and lab profile and to study morbidity and mortality pattern in H1N1 positive children.

Material & Methods

Place of study – Department of Pediatrics, S. M. S. Medical College and attached Hospital Jaipur.

Type of study – Hospital based observational study.

Study period: June 2018 to March 2019.

Sample Size

The sample size was calculated at 95% confidence level alpha error 0.05% assuming 26% of the children with suspected Influenza were positive for H1N1 on throat swab specimen as per the reference article (Clinical profile and outcome of H1N1influenza in children – a tertiary care experience).

At 8% absolute allowable error the require sample size would be132 children with suspected Influenza illness.

Inclusion criteria

Children with confirmed H1N1positive report.

Exclusion criteria

1. Age above 18 year
2. Refusal for consent.

Methodology

One hundred and thirty two patients with the diagnosis of H1N1 Flu were included in this study. Nature and the purpose of the study were explained fully to the parents / guardian and written consent was taken from parents or attendants of all enrolled children. A predesigned structural proforma was used to collect

information. Basic demographic data e.g. age, sex, parents name, residential address was collected from all patients.

Detail history, clinical examination was done and routine investigation including complete blood count, renal function tests, liver function tests, serum calcium, H1N1 swab tests and x- ray chest were sent.

Statistical Analysis

Statistical analysis was performed using SPSS for Windows (Version 16.0, 2007; SPSS Inc, Chicago, IL,USA). Paired *t*- test (for continuous variables) was used to compare the variables. Statistical significance was assessed at 0.05 probability level. All the values are presented as mean ± standard error mean (mean ± SE) or numbers (%).

Results

Table No. 1: Age wise distribution

Age Group (month)	Number of Cases	Percentage
0-5 years	95	71.96
>5-10 years	37	20.45
>10 years	10	7.58
Total	132	100.00

This table show age wise distribution of H1N1 patients. Out of 132 H1N1 patients, maximum patients 71.97% were in between 0 – 5 years of age group. Other include 20.45% in between 6-10 yrs age group and 7.58% in >10yrs age group.

Table No. 2: Sex wise distribution

Sex	Number of Cases	Percentage
Male	94	71.21
Female	38	28.79
Total	132	100.00

This table shows the sex distribution of study population. Ninety four were males (71.21%) and 38(28.79%) were females.

Table 3: Clinical Feature of H1N1 Flu (Total number of H1N1 cases = 132)

	Fever	Cough	Coryza	SOB
Number of cases	132	131	89	37
Percentage	100%	99.24%	67.42%	28.03%

This table show clinical manifestation of H1N1 positive patients. Fever was present in all cases, cough in 99.24%cases, coryza in 67.42% cases and shortness of breath in 28.03% cases.

Table 4: Other Clinical features

Other	Number of Cases	Percentage
Diarrhoea	14	10.61
Vomiting	14	10.61
Throat pain	4	3.03
Seizure	2	1.52

This table show other less common manifestation of H1N1 patients in which diarrhoea & vomiting in 10.61% cases, throat pain in 3.03% cases, seizure in 1.52 % cases.

Table 5: Mean and standard deviation of Lab Profile

	Mean	SD
Haemoglobin	11.10	7.91
TLC	8330.68	7614.52
Platelet	232.70	110.84
S. Calcium	8.67	0.52
SGOT	57.83	68.13
SGPT	33.00	39.81
S. Urea	26.48	11.06
S. Creatinine	0.58	0.09

This table show mean and standard deviation of lab profile.

Table 6: Survival / Non Survival of H1N1 Cases

		Number of Cases (n=132)	%
Survival (N=128)	Only H1N1 Flu	110	83.33
	Co-Morbidity	18	13.64
Non Survival (N=4)	Only H1N1 Flu	0	0
	Co-Morbidity	4	3.03

This table shows case fatality rate in H1N1 cases which is 3.03 %. Total number of survival cases were 128 (96.97%).

Discussion

This was a hospital based prospective observational study, conducted between June 2018 to March 2019 in Sir Padampat Mother and Child Health Institute (SPMCHI), Department of Paediatric Medicine, SMS Medical College, Jaipur.

The proportion of H1N1 flu infection varies in various age groups. In our study 71.96 % were in age group of 0 – 5 years, 20.45% were in the age group of 5 – 10 years and 7.58 % were in the age above > 10 years. So , the maximum numbers of patients were in the age group of 0 – 5 years. Similarly, Sujatha et al.[1] found that84.44% cases were in age group of 0 – 5 years , 11.15 % were in age group of 6 – 10 years and 4.44% were in age above > 10 years. The similar result were also found in another study by Ramya H. S et al.[10]55.8 % patients were in age group of 0 – 5 years, 27.1 % patients were in age group of 5 – 10 years , 17.1% patients were in age of above >10years. Similarly, Chaitanya K et al.[11]and Chudasama RK et al.[12] also found the majority of patients in age group 0 – 5 years.

In our study, there were 94 males and 38 females out of 132 patients and sex ratio was 2.47:1, showing male sex predominance. Similarly, the studies conducted by Abdelmotaleb et al.[13] and Sujatha et al.[1]also showed male preponderance with sex ratio 1.71:1 and 1.57:1 respectively. In another study K Pushpalatha et al.[14]also found male sex predominance, the sex ratio was 1.41:1.

Fever, cough and coryza (100%) were the most common clinical manifestations in our study subjects followed by shortness of breath (28.06%), diarrhoea and vomiting (10.61%), throat pain (3.03%) and seizure (1.52%). Similarly, the study conducted by Sujatha et al.[1] in Hyderabad found that fever, cough and cold (100%) were the most common clinical manifestations followed by S.O.B (25.55%), diarrhoea (11.11%), sore throat (3.33%) and convulsions (2.22%). In another study, K Pushpalatha et al.[14] also found that100% confirmed H1N1 cases had fever, 95.4% had cough, 81.8% had breathlessness. Similarly, the study conducted by Pankaj Kumar Mandal et al.[15] revealed that fever, cough(100%) and sore throat were the most common clinical manifestations in confirmed cases of H1N1influenza.Van'tKlooster TM et al.[16] analysed the data of the H1N1 influenza in Saudi Arabia, they reported cough (54%) and sore throat (32%) as the predominant symptoms followed by rhinitis (17%) and difficulty in breathing (7%).Similarly, Talavera et al.[17]in Southern Mexico, Chudasama et al.[18] in Saurastrha, India were reported that fever, cough and coryza were the predominant clinical manifestations.

In our study anaemia (Hb<11gm/dl) was present in 64.39 % which was due to nutritional deficiency and haemoglobin >11gm/dl was in 35.61 % patients. The

mean Hb level was 11.10gm/dl. Similarly, study done by Chudasama et al.[12]also found anaemia (Hb <11gm/dl) in more than three fourth children (74.53%).

In our study total leucocyte count was<4500/cu mm in 15.15 %cases, 4500 – 10000/cu mm in 64.39% and >10000/cu mm in 20.45%cases, the mean TLC was 8330.68/cu mm. Similarly, Chaitanya K et al.[11] also found that the TLC (total leukocyte count) <5000/cu mm in 25% and >14000/cu mm in 16.66% with lymphocytic predominance in 66.66% of them. In another study, done by Chudasama et al.[11] found TLC <4000/cu mm in 15.1% cases and >10000/cu mm in 34.9%cases. Similarly, Ashish Jain et al[29]conducted a death audit of H1N1 positive cases found that TLC <4000/cu mm in 42.5% cases, 4000-11000/cu mm in 12.5 % cases and >11000/cu mm in 45% cases.

In our study thrombocytopenia was present in 21.21% cases and normal platelet counts were present in 78.79% patients. The mean platelet count was 2.32lac. Similarly, Chudasama et al.[11] found thrombocytopenia in 25% cases with mean platelet count was 2.76lac. Our finding were also similar with study done by Ashish Jain et al[19] where they found that thrombocytopenia was present in 27.5% cases and normal platelet counts were present in 60% cases.

In our study liver function tests were normal in 90.15% cases and deranged liver functions were more seen in patients present with pre existing co morbid conditions. Study done by, Chudasama et al.[11] found normal liver functions in 62.5% cases and deranged liver functions in 37.5%cases the discrepancy might be due to small sample size of their study.

In our study radiological finding were normal in 66.66% and abnormal in 33.34% cases. Main radiological findings were bilateral infiltration (24.24%) followed by patchy pneumonia (6%) and hyper infiltration (3%). Study done by Ramya H. S et al.[10]found that the chest x-ray was abnormal in form of bilateral involvement and extensive pneumonia was present in 18%cases. Similarly, Ashish Jain et al[19]conducted a death audit of H1N1 positive cases and found that 95% deceased person's chest radiographs showed bilateral heterogeneous opacities. In another study done by Chaitanya K et al.[11] shows that the chest X-ray was normal in 38.88% cases, patchy consolidation in 33.33%, prominent bronco-vascular markings in 22.22% and pleural effusion in 5.55%cases the difference with our study might be due to small sample size of their study.

In our study the total no. of patients with co- morbid condition were 16.67% (n=22). The mortality rate was 18.18% in patients with pre existing co morbid condition. All non survivor cases presented with co – morbid conditions out of which one had Pancytopenia with bronchopneumonia, second had Severe anaemia with infantile tremor syndrome, third diagnosed as Septicaemia with meningoencephalitis and fourth case of Acute respiratory distress syndrome. The case fatality rate was 3.03%(n= 4) in our study probably due to higher incidence of pneumonia and other serious complications. Similarly, Chaitanya K et al.[11]show case fatality rate was 2.8%. Ashish Jain et al (2017)[19] conducted a death audit of H1N1 positive cases the case fatality rate was 6.6% (40/606) in this study. Another retrospective descriptive study conducted by Malhotra B et al (2016)[20] in Rajasthan during January to March 2015, the case fatality rate was 6% in this study.

Conclusion

We concluded that the Influenza A (H1N1) was highly infectious disease in paediatric age group population. Influenza A(H1N1) was highly prevalent in under five

year age group children with slight male preponderance. Fever, cough and coryza were the most common presenting complaints in H1N1 patients followed by shortness of breath which were in one third of H1N1 patients then diarrhoea, vomiting, sore throat and seizure less common. In majority of H1N1 patients total leucocytes counts and liver function test remained inconclusive. Chest radiograph were normal in more than two third of patients with H1N1 infection but manifest as bilateral lung involvement in severely ill patients who were at high risk.

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