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ANALYSING THE CLINICAL PROFILE OF INFLUENZA A(H1N1) INFECTED PATIENTS : OCT 2018-FEB 2019, AHMEDABAD, INDIA

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ABSTRACT:

Introduction:

Influenza virus is a common human pathogen that has caused serious respiratory illness and death over the past century. In April 2009, a new strain of Influenza virus A H1N1, commonly referred to as “swine flu”, began to spread in several countries around the world, and India confirmed its first case on 16 May 16 2009.

Aim:

To study the clinical and epidemiological profile of Influenza A H1N1 cases at the Sheth Vadilal Sarabhai General Hospital, Ahmedabad.

Materials and Methods:

Clinical epidemiological characteristics of Influenza A H1N1 cases from October2018 to February 2019 were retrospectively, descriptively analyzed using data from isolation ward and ICU at the Sheth Vadilal Sarabhai General Hospital, Ahmedabad. Data were Analyzed using MS Excel software.

Results:

Out of 86 patients studied 36(51.16%) were males and 34(48.83%) were females. Almost half of the patients(47.67%) were in the age group of 12-40 years. 6.9% mortality was found irrespective of age group of the patients. Majority of the patients had bronchopneumonia(39.53%) and bronchovascular prominence(41.86%), and very few of them had lobar consolidation(8.13%). Here we had 63(73.25%) patients in category B and 23(26.74%) patients in category C, all the patients from category C required Ventilatory support either Non invasive or invasive and 16(34.16%) of category B patients also required ventilatory support.98.83% patients had complaint of fever on presentation. 36.04% had breathlessness, 52.32% had coughing, 39.53% had sore throat, 30.23% had generalised

weakness, 5.81 % had rhinitis, shock, blood in sputum,1.16% presented with diarrhea. None of them presented with vomiting which is commonly found in other infections of influenza.

15.11% had hypertension, 10.46% had type 2 DM, 9.30% had IHD,10.46% had COPD, 5.81% had hypothyroidism, 4.65% had tuberculosis, 2.32% had CVA. Out of 42 females 4 were pregnant and 1 was post partum. Almost half of the patients(46.51%) required ventilatory support in their course of hospitalization.

Conclusion:

On the basis of these findings, it can be safely hypothesized that prevalence of Influenza A H1N1 is high in the younger population, and fever, cough and sore throat are the most common symptoms with which the patients usually present. in course of hospitalization half of the patients required ventilatory support which was weaned off later on. Associated comorbid conditions particularly hypertension, diabetes, and COPD were associated with longer duration of hospital stay and complications. Delay in hospital presentation and longer duration of onset symptoms and administration of treatment were linked to poor outcome. Despite of various efforts of government for awareness , patients fails to seek timely medical advise. Over all if presented early after onset of the symptoms can lead to better outcomes.

INTRODUCTION

Influenza virus is the subtype of influenza A virus, it is an orthomyxovirus that contains the glycoproteins, haemagglutinin, and neuraminidase for this reason they are described as H1N1, H1N2, H1N5, H2N3, H3N1, H3N2 etc depending on type of H or N antigens, they expressed with metabolic synergy, Haemagluttinin causes RBC to clump together and binds virus to infected cells, Neuraminidase is type of glycoside hydrolase enzyme which helps to move the virus particles through the infected cells and assist in budding from the host cells.

Influenza is an acute, usually self-limited, febrile illness caused by infection with influenza viruses and occurs in outbreaks of varying severity almost every winter. Most cases of pandemic influenza H1N1 infection have been mild or subclinical,The symptoms are similar to those of influenza and of influenza like illness in general namely chills, fever , sore throat, muscle pain, severe headache, coughing, weakness, generalised discomfort. some patients experienced severe illness and complications from H1N1 influenza infection. The most common cause of death is respiratory failure; other causes of death are pneumonia, high fever leading to neurological problems,and acute kidney injury, dehydration, and electrolyte

imbalance. Persons at high risk for severe disease and complications secondary to 2009 pandemic H1N1 influenza A include patients with underlying pulmonary or cardiac comorbid conditions, immunosuppressive states, pregnancy and postpartum states, diabetes mellitus, obesity and in children with prior neurological disabilities.

The most important complication of 2009 H1N1 are Lower respiratory tract involvement, acute respiratory failure, and acute respiratory distress syndrome refractory hypoxemia, secondary bacterial infections, septic shock, acute renal failure, cardiac dysfunction and multiple organ dysfunction. Worsening underlying chronic disease such as asthma, COPD, congestive heart failure may occur. Extrapulmonary complications though less common are myositis, rhabdomyolysis, myoglobinuria, myocarditis and pericarditis. At times central nervous system complications may arise like encephalitis, transverse myelitis, GBS, Reyes syndrome.

In the state of Gujarat, the first case of 2009 H1N1 influenza A was reported on 3rd August 2009, and by 28th February 2010, 1209 cases were reported and 289 patients died. We experienced a spectrum of illness ranging from mildly symptomatic patients to severe illness. Here we report the clinical characteristics and outcomes of hospitalized patients in a tertiary care hospital in Ahmedabad, Gujarat with confirmed H1N1 infection during 2018/2019 influenza season.The need to study the trend and pattern of this virus is because of recuurent outbreaks every year.

OBJECTIVES OF STUDY:

To study the clinical profile and outcome of patients admitted with influenza A virus with a perspective to look into risk factors likely to be associated with complications.

MATERIALS AND METHODS

This is a hospital-based retrospective study of the influenza cases admitted at Sheth Vadilal Sarabhai general hospital, Ahmedabad. Patients infected with H1N1 virus who were hospitalized from October 2018 to February 2019 were included in the study. Demographic data, history, and physical examination findings were recorded in the hospital history and on the examination sheet. Inpatient charts were used to collect patient's hospital course and treatment. Diagnosis of H1N1flu was confirmed by polymerase chain reaction (PCR) testing of respiratory secretions (throat swab, endotracheal secretion) conducted at Microbiology Department,. Smt.N.H.L. Municipal Medical College, Ahmedabad.

Patient who were suspected to have H1N1 flu PCR positive patients were treated with T.oseltamivir 75 mg bd. Detailed evaluation and trend of laboratory and radiological investigation were studied. Supportive treatment was modified according to the patient by respective treating physicians. and according to various clinical and biochemical parameters

some of the patients were kept on Non invasive or invasive ventilatory support as per their respiratory status..

All the patients diagnosed with H1N1 influenza were treated in isolation ward and discharged after adequate clinical response.

ANALYSIS

The collected data was analysed using Microsoft Excel software. Exposure variables, which were statistically significant in univariate analysis or deemed clinically important (age, sex, co-morbidities, ventilatory care, and pneumonia), were included in the multivariate analysis.

OBSERVATION AND RESULTS:

A total of 86 patients were studied for their demographic details, clinical presentations, prognosis and outcome.Out of 86 patients studied 36(51.16%) were males and 34(48.83%) were females. Almost half of the patients(47.67%) were in the age group of 12-40 years. 6.9% mortality was found irrespective of age group of the patients.

	MALE	FEMALE	TOTAL	MORTALITY
0-20	0	0	0	0
21-40	21	20	41	2
41-60	15	17	32	2
60-80 and above	8	5	13	2
TOTAL	44	42	86	6

TABLE NO. 1 AGE AND SEX

X ray changes are very important part in diagnosis and outcome of the patient. Majority of the patients had bronchopneumonia(39.53%) and bronchovascular prominence(41.86%), and very few of them had lobar consolidation(8.13%). Out of 86 only 3(3.48%) patients had ARDS in radiological findings but they are associated with very poor prognosis and high mortality.

XRAY FINDINGS	NO. OF PATIENTS
BRONCHOPNEUMONIA	34
BRONCHOVASCULAR PROMINENCE	36
LOBAR CONSOLIDATION	7
ARDS	3
NOT AVAILABLE	6
TOTAL	86

TABLE NO.2 XRAY FINDINGS

In Category A will be those who do not require testing for H1N1. Patients with mild fever, cough and sore throat, body ache, headache, nausea and diarrhoea will be put in Category A and can be monitored for 24-48 hours. These patients are advised to stay at home and not mingle with the others. They will not need testing for H1N1 and no treatment with Oseltamivir.

In Category B will be those who have all the symptoms mentioned in Category A, but have high-grade fever and are in the high-risk category; they will need treatment with Oseltamivir and will have to be confined at home. “High-risk category includes children with mild illness, pregnant women, persons over 65, patients with lung, liver, heart, kidney, blood or neurological diseases or have been on long-term cortisone therapy.”

In Category C will be those who have all the signs and symptoms of Category A and B and depending on their health condition will have to be hospitalised. “If the patients have breathlessness, chest pain, drowsiness, fall in blood pressure, sputum mixed with blood, bluish discolouration of nails they will need to be immediately hospitalised and started on the medicine,” said the official. This category will also include children with influenza-like illness, high and persistent fever, inability to feed, convulsions and difficulty in breathing.

Here we had 63(73.25%) patients in category B and 23(26.74%) patients in category C, all the patients from category C required Ventilatory support either Non invasive or invasive and 16(34.16%) of category B patients also required ventilatory support.

CATEGORY ON ADMISSION	NO. OF PATIENTS	VENTILATION REQUIREMENT
A	0	0
B1	17	1
B2	46	16
C	23	23
TOTAL	86	40

TABLE NO. 3 CATAGORY ON ADMISSION

Out of 63 patients of category B, 3 patients progressed to category C.

98.83% patients had complaint of fever on presentation. 36.04% had breathlessness, 52.32% had coughing, 39.53% had sore throat, 30.23% had generalised weakness, 5.81 % had rhinitis, shock, blood in sputum,1.16% presented with diarrhea. None of them presented with vomiting which is commonly found in other infections of influenza.

CLINICAL FEATURES	NO. OF PATIENTS
FEVER	85
BREATHLESSNESS	31
COUGHING	45
SORE THROAT	34
GENERALISED WEAKNESS	26
RHINITIS	5
SHOCK	5
HEMOPTYSIS	3
DIARRHEA	1

TABLE NO. 4 PRESENTING CLINICAL FEATURES

15.11% had hypertension, 10.46% had type 2 DM, 9.30% had IHD,10.46% had COPD, 5.81% had hypothyroidism, 4.65% had tuberculosis, 2.32% had CVA.

Out of 42 females 4 were pregnant and 1 was post partum.

COMORBIDITIES	NO. OF PATIENTS
HYPERTENSION	13
TYPE 2 DM	9
IHD	8
COPD	9
HYPOTHYROIDISM	5
TUBERCULOSIS	4
CVA	2
PREGNENCY	4
POST PARTUM	1

TABLE NO. 5 COMORBIDITIES

Almost half of the patients (46.51%) required ventilatory support in their course of hospitalization. out of which 70% were on non invasive support which was weaned off subsequently on the basis of clinical response of the patient.

VENTILATORY SUPPORT	NO. OF PATIENTS
NIPPV	28
INVASIVE VENTILATION	12
TOTAL	40

TABLE NO.6 TYPE OF VENTILATION REQUIRED

The delay in seeking medical advice was noted as most of the patients(90.69%) presented after 48 hours of onset of the symptoms. which might be due to close resemblance of H1N1 flu with other variants of influenza

TREATMENT AFTER SYMPTOMS APPEAR	NO. OF PATIENTS
< 48 HRS	8
> 48 HRS	78
TOTAL	86

TABLE NO. 7 TREATMENT AFTER ONSET OF SYMPTOMS

Out of 78 patient presenting after 48 hours after symptoms onset 22 patients were having SPO2 < 94%.

DISCUSSION

The characteristic feature of this pandemic influenza infection was that, case distribution was disproportionate among all age groups but the patients belonging to 21-40 years followed by 41-60 years of age group found to be more affected than the other age groups, which was also reflected in other studies. This finding also corroborates with the study of Jin Lv et. al, 2017. reporting higher prevalence in elder age group which was not exposed previously. In our study it was observed that infection rate was higher among male individuals (51.16%) than females (48.83%) though the difference is not significant. Similar observation was reported in some studies indicating different behaviour, hormone response and susceptibility to infectious diseases may be the reason for this difference among males and females.

Among the confirmed positive cases for Influenza A(H1N1) common symptoms observed were fever(98.82) and cough (52.32%) followed by shortness of breath (36.04%). This can be used for preliminary diagnosis of Influenza A infection during the influenza season prior to lab diagnosis report. The symptoms presented with very short confined time period.

Studies showed that various risk factors like age, co-existence of chronic diseases, pregnancy and the time from symptom onset to hospital admission, with particularly elevated risk among elders, infants, pregnant women, hypertension, immune-suppression, or delayed hospital admission were associated with severity of morbidity and mortality of Influenza A(H1N1)pdm09 In contrast few studies that had shown up to 90% patients having any one underlying conditions like pregnancy, post partal period etc. Similarly, Pregnancy is a well documented risk factor for severe infection and death in previous pandemics. It was noted that hypertension and diabetes were other co-morbid conditions

Among the Influenza A(H1N1) patients most of them presented after 48 hours after onset of symptoms. Delay in treatment associated with high morbidities and mortality.

Though our study gives an impression on associated risk factors for mortality, it is limited by certain amount of missing clinical data like pre-existing respiratory disease, small numbers, incomplete records on epidemic dynamics within the population and health structure/referral chain.

Thus far, in contrast to seasonal influenza viruses, the 2009 H1N1virus has disproportionately affected younger populations. Its virulence is similar to that of seasonal influenza viruses. Whether this virus will displace or cocirculate with the current seasonal strains is unknown. Clinicians are advised to stay up to date regarding H1N1 by frequently checking Web sites authored by the CDC and state health departments. An effective

response to this pandemic and the amelioration of the associated morbidity and mortality must be predicated on a vaccinated, working, and informed health care population.

According to the data from WHO till March 2010, this new Influenza A(H1N1) was estimated to have a case-fatality rate (CFR) of 1.28%. The CFR in our study was (6.9%). The CFR during the wave was high in the fall season.

CONCLUSIONS

On the basis of these findings, it can be safely hypothesized that prevalence of Influenza A H1N1 is high in the younger population, and fever, cough and sore throat are the most common symptoms with which the patients usually present. And in course of hospitalization half of the patients required ventilatory support which was weaned off later on. associated comorbid conditions seemed to be fatal and lead to poorer prognosis. Despite of various efforts of government for awareness yet patients fail seek medical advise. but over all if presented early after onset of the symptoms can lead to better outcomes.

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