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Epidemic of Swineflu H1N1 (2018) in Kurnool-Clinical and Microbiological Aspects

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A B S T R A C T

Respiratory tract infections are among the most common infections in India. Multiple etiological agents are involved in the causation of these infections. Swine flu H1N1 is one among the influenza viruses which has great potential to cause epidemics as well as pandemics with great mortality and morbidity. All the suspected cases should be identified at the earliest so that interventions can be taken to prevent the spread of infections and thus contain the outbreaks. Molecular methods like PCR is extremely important for the diagnosis of these viral infections Aims and objectives: The present study aims to know the prevalence of Swineflu H1N1 infections by using Truenat H1N1 micro PCR system in and around Kurnool with a special emphasis on the outbreak of infection and to understand the clinical and demographical distribution of these cases. Methodology: This was a prospective study done during the swine flu epidemic period of September 2018 to Nov 2018. All the suspected cases belonging to Category C were kept in isolation ward and laboratory testing for H1N1 was done for these cases. Nasal or throat or nasopharyngeal swabs were collected by nylon swab and transported in the viral lysis medium and nucleic acid was detected by Truenat H1N1 micro PCR assay as per the manufacturer protocol Results : A total of 102 samples were tested during the study period out of which 48(47%) were positive for H1N1 swineflu. Out of these 48 cases 18 patients died with a mortality rate of 37.5%. People in the age group 35-50 years were predominantly affected. The associated comorbid conditions included hypothyroidism (11%), CKD (11%), preexisting lung diseases (COPD and H/o previous TB) (11%) and diabetes (11%). Hemoptysis was associated with increased mortality which was only observed in the death cases (22%). Decreased platelet count was also commonly observed among the death cases when compared to other positive cases (22% Vs 4%). Conclusion: Continuous surveillance for swineflu cases in extremely important in the early diagnosis of cases which in association with the early initiation of treatment and infection control practices will not only decreases the mortality but also prevents the spread of epidemics.

Introduction

Seasonal outbreaks with the influenza virus are quite common in India. Swine flu H1N1 is one among the influenza viruses which has great potential to cause epidemics as well as pandemics with great mortality and morbidity.

After 2009 pandemic of Swine flu, increased awareness has been observed throughout the world and continuous monitoring for the cases has been under surveillance (1). For this it has become mandatory that all the suspected cases should be identified at the earliest so that interventions can be taken to prevent the spread of infections and thus contain the outbreaks. Molecular methods like PCR is extremely important for the diagnosis of these viral infections. But the convetional PCR methods are time consuming and needs expertise.

In this scenario chip based PCR techniques have been developed which can be performed even at the periphery level without much expertise.

The present study aims to know the prevalence of Swineflu H1N1 infections by using Truenat H1N1 micro PCR system in and around Kurnool with a special emphasis on the outbreak of infection and to understand the clinical and demographical distribution of these cases.

Materials and Methods

This was a prospective study done during the swine flu epidemic period of September 2018 to Nov 2018. As per the guidelines of Ministry of Health and Family Welfare, Government of India, all the suspected cases belonging to Category C were kept in isolation ward and laboratory testing for H1N1 was done for these cases. Category A and B were excluded from the study (2).

Clinical specimens like nasal or throat or nasopharyngeal swabs were collected by nylon swab and transported in the viral lysis medium and nucleic acid was detected by Truenat H1N1 micro PCR assay as per the manufacturer protocol(Molbio) and according to the previous study(3). Results were obtained within 2 hours and all the confirmed cases were notified accordingly.

Results and Discussion

A total of 102 samples were tested during the study period out of which 48(47%) were positive for H1N1 swineflu. Out of these 48 cases 18 patients died with a mortality rate of 37.5%. majority of the patients were daily wagers (72.9%) and all the age groups were affected starting from 4years to 72 years but predominantly people were in the 35-50 years age group

Patients who have died (18 cases) presented with the high grade fever with productive cough and sudden onset of breathlessness with the duration ranging from 1 day to 3 days and all of them had bilateral lower zone consolidation with bilateral crepts on auscultation. ARDS was the most important cause of death in these patients

The associated comorbid conditions included hypothyroidism (11%), CKD (11%), preexisting lung diseases (COPD and H/o previous TB) (11%) and diabetes (11%). Hemoptysis was associated with increased mortality which was only observed in the death cases (22%). Acute myeloid leukemia was observed in two young male patients both of which have succumbed to death.

In one female patient both dengue and H1N1 was positive. There was a single case of HIV positive child who suffered from swineflu. With the treatment she has recovered completely. One Child aged 4 years died because of swineflu. She has associated myxedema (Hypothyroidism)

Decreased platelet count was also commonly observed among the death cases when compared to other positive cases (22% Vs 4%). Other blood parameters are not significantly altered except lymphocytopenia which was observed in 2 cases. Elevated levels of SGOT and SGPT were observed in 3 cases.

Cycle Threshold

In true nat assay Ct value (cycle threshold) was between 18 to 25 in majority of the death patients where as in other patients who survived, it ranged from 22 to 31 cycles predominantly. As it is known that Ct values are inversely proportionate to the amount of nucleic acid present, this finding may roughly correlate with the significantly higher amount of viral load in the death patients (assuming the standard conditions of sample collection)

Table.1 Distribution of cases according to sex wise

Sex	Number of cases	Number of positives	Positive Percentage
Male	53	26	49%
Female	49	22	44.8%
total	102	48	47%

Table.2 Distribution of cases according to age wise

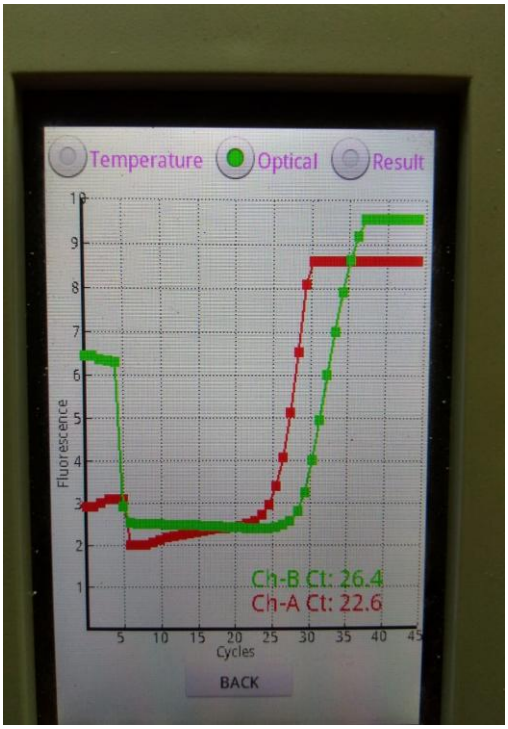
Age	Number of cases	Number of positives
Less than 20 years	8	4
20-29	19	8
30-39	23	12
40-49	21	11
50-59	21	9
60 and above	10	4
Total	102	48

Table.3 Clinical presentation of the cases

Clinical presentation	Number of cases (Percentage)
Fever	100%
Cough	75.1%
Cold/ rhinitis/running nose	63.9%
Sore throat	46.8%
Dyspnea	19.5%
myalgia	42.4%
Headache	18.5%
Diarrhea	20%

Fig.1 Truenat H1N1 CHIP based micro PCR System

Fig.2 Optical display of the positive sample Ct value along with the control value



Since the 2009 pandemic of swine flu influenza virus, cases continue to exist in the Indian subcontinent with frequent upsurges in between. Viral isolation and nucleic acid amplification tests such as real time PCR are the most reliable diagnostic tests for H1N1

with greater performance. In the present study a total of 102 suspected cases of influenza cases were tested for swine influenza H1N1 by truenat micro PCR system during the outbreak period where 48 samples came as positive for H1N1. Many studies from India have shown different positivity rates from 7% to 27%. (4-7) our positive percentage were higher than the other Indian studies during the epidemic period.

In our study maximum number of cases were males and younger population with patients between 20-40yrs was affected more. Around half of the cases screened were younger population and among the confirmed H1N1 cases 66.6% were in this age group. Similar findings were observed in other studies. In Sidhharth *et al.*,[8] study Majority of the patients (56.48%) were males and 81.4% of the affected population was younger population below the age of 40 years.

All the H1N1 positive cases presented with fever and cough and majority of them (80%) were having shortness of breath. On auscultation crepts were noted in majority of the positive cases. In Nandini *et al.*,[9] study also fever was the most common symptom (98%) followed by cough (85%). Similar findings were also observed in Choudhry *et al.*, study[10]

In the present epidemic young patients suffered predominantly and mortality was also very high. Thorough investigation of the clinical cases may give some insights into the pathogenesis of these infections. Inview of high mortality, the samples have also been sent to NIV pune for further investigations.

Early detection of swineflu cases during the epidemic period not only helps in the early initiation of the treatment but also prevents the spread of the epidemic which inturn decreases the mortality and morbidity. chip based real time PCR technology systems was extremely helpful in the identification of H1N1 cases which further helped in the early treatment and appropriate infection control policies implementation thus preventing the spread of the epidemic.

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