

Clinical Profile of Swine Flu RT-PCR Positive in Children of Tertiary Care Centre

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Abstract: Background: The H1N1 influenza A, also known as swine flu, has caused wide spread panic not only in India, but across the world. It emerged as pandemic in 2009 and made the whole world realize its dreadful presence. Similar episodes of diseases was also seen the year 2017. Early diagnosis, identification of the risk factors and prompt antiviral treatment along with preventive measure, including vaccination and chemoprophylaxis are the mainstay of management and can help in containment of this deadly disease. Our study focused on children affected with swine flu in Agra region. Material and Methods: A retrospective study was conducted in children (0-18 years) of either sex attending out patient department/admitted in Sarojini Naidu Medical College, Agra between 2016-2017 who are suspected to have swine flu. All the cases were subject to detailed clinical history such as duration of illness, presenting symptoms, past illness, history of close contact in the family, immunization history, nutritional status, A thorough clinical examination was done including general examination, and systemic examinations and the diagnosis confirmed by Reverse Transcriptase Polymerase Chain Reactions (RT-PCR) on respiratory specimen. Conclusion: During the epidemic of swine flu in Agra region majority of cases were category. A with mild symptoms. Home quarantine and preventive measures during the epidemic were found to be more important than testing and treating with oseltamivir. Mass media awareness played important role in seeking early medical care and diagnosis and treatment.

Keywords: H1N1 influenza; Oseltamivir, Swine-flu, RT-PCR

1. Introduction

Swine flu, is an acute infection of the respiratory tract caused by influenza viruses. Influenza A viruses also have the potential to cause periodic global pandemics with even higher penetrance of illness than seasonal epidemics [1]. The currently circulating strain of swine origin influenza virus of the H1N1 strain has undergone triple reassortment and contains genes from the avian, swine and human viruses [2,3]. It is believed to be a legacy of the influenza pandemic of 1918-1919 the virus having adapted over the last 100 years and has now acquired the ability to not only infect but also spread within the human host [4]. The epidemic of 2009 H1N1 influenza is spreading rapidly in the Indian subcontinent with more than 23727 cases and 782 deaths [6]. There have been sporadic reports about swine flu in paediatric population [7-9].

According to IDPS 8543 peoples succumbed to deadly swine flu virus between 2010 and October 2017 (Total 1.14 lakh were affected), swine flu cases have seen 20 fold rise, INDIA worst outbreak was in pandemic year 2009-2010, when H1N1 affected more 50000 peoples and killed more than 27000 peoples worldwide (Times of India Nov, 13, 2017). We hereby share our experience with 2017 H1N1 influenza in children attending our hospital.

HIGH RISK GROUPS FOR ACQUIRING INFLUENZA (2) includes Infants, Young children <5 years, Pregnant women, Elderly >65 yrs, Persons of any age with the following chronic conditions- Chronic pulmonary or cardiovascular conditions, Chronic neurological conditions

that impair breathing or clearance of respiratory secretions, Chronic metabolic diseases, Renal dysfunction. Hemoglobinopathies Immuno-suppressed /immune-compromised, Residents of nursing homes and other chronic care facilities, Obesity.

Case definition for swine flu: [4] **A suspected case:** A person with acute febrile viral like illness, having flu like respiratory symptoms and either of the following: resides in a state with confirmed cases of swine flu OR has traveled to a state/country within last 7 days where there are one or more confirmed cases OR has been in close contact with a suspected/confirmed case of swine flu with last 7 days. **A probable case-** A person with flu like symptoms who is positive for influenza A, but the subtype (H1 or H3) cannot be determined by the tests. **A confirmed case-** a person having flu like symptoms with laboratory confirmed influenza A (H1N1) virus infection by Real-time polymerase chain reaction (RT-PCR) or viral culture or four fold rise in new influenza A (H1N1) virus-specific neutralizing antibodies.

2. Diagnosis

In a patient with suspicion of swine flu, diagnosis of H1N1 influenza virus requires collection of respiratory specimen (nasopharyngeal swab, throat swab, nasal aspirate or nasal washing) within the first 4 to 5 days of onset of illness (when an infected person is most likely to be shedding virus). The sample is then tested by using reverse transcriptase polymerase chain reaction (RT-PCR), virus culture or isolation, and assays to detect a 4-fold rise of influenza virus antigens [6, 7, 8]. The other Rapid Antigen

Tests available have low sensitivity and specificity so not recommended for diagnosis [4,6,8]. RT-PCR is considered the gold standard for diagnosis with high sensitivity and specificity [8].

Government of India guidelines for H1N1 patients [4,5]: These guidelines were issued to contain the spread of swine flu considering the highly contagious nature of H1N1 influenza.

Category- A: Patients with mild fever plus cough / sore throat with or without bodyache, headache, diarrhoea and vomiting. They do not require Oseltamivir and are managed symptomatically. Patients should be monitored for their progress and reassessed at 24 to 48 hours. No testing for Influenza is required in these patients. Patients are advised to confine themselves at home and avoid mixing up with public and high risk members in the family

Category B: The patients with signs and symptoms of Category-A plus, if the patient has high grade fever and severe sore throat, may require home isolation and Oseltamivir, signs and symptoms Category-A plus, individuals having one or more of the above mentioned high risk conditions shall be treated with Oseltamivir.

Category C: In addition to the above signs and symptoms of Category-A and B, if the patient has one or more of the following: Breathlessness, Chest pain, Drowsiness, Hypotension, Sputum mixed with blood, Bluish discoloration of nails requires immediate hospitalization and treatment.

Red flag signs in a child with influenza like symptoms and requiring urgent intervention include: Somnolence (drowsiness), high and persistent fever, Inability to feed well, convulsions, shortness of breath, difficulty in breathing.

3. Material and Methods

A retrospective study conducted on children aged (0-18 years) of either sex who attended OPD and admitted in Sarojini Naidu Medical College, Agra with suspected swine flu symptoms. All the cases were subjected to detailed clinical history such as duration of illness, presenting symptoms, history of close contact with a confirmed case of swine flu A (H1N1) past illness, immunization history, nutritional status. A thorough clinical examination was done including general examination, and systemic examinations. In a patient with suspicion of swine flu, diagnosis is done by taking nasopharyngeal swab within the first 4 to 5 days of onset of illness (when an infected person is most likely to be shedding virus) taken under sterile condition. The sample is then tested by using reverse transcriptase polymerase chain reaction (RT-PCR) method in microbiology lab of Sarojini Naidu Medical college (SNMC) Agra. The diagnosis of 2009 H1N1 influenza was confirmed by testing of combined nasal and throat swabs with the use of a RT-PCR assay. Children were treated with oseltamivir as per the available guidelines issued by the Ministry of Health, Government of India, which were periodically revised [10]. In children presenting with mild symptoms, the medication was

administered if the RT-PCR assay confirmed the diagnosis. In children who were admitted with a suspicion of swine flu, medication was started after sending the sample for the RT-PCR test; it was continued in those who tested positive. The study was conducted as a retrospective analysis of de-identified data.

4. Results

In current study, 60% of the patients were males (n=45) and 40% (n=30) were females. Majority (60%) of the patients were under 5 year of age. Among male patients (n=45), majority of the patients were <1 years old (72.2%), while among female patients (n=30) majority of the patients were 11–15 years old (60%). The most common symptoms associated was fever (95%) with cough and cold (87%). Other symptoms were vomiting (24%), loose stool (9%), difficulty in breathing (11%), loss of appetite (8%). Few rare symptoms were headache, abnormal body movements, abdominal pain, malaise, sore throat, sneezing etc. Most of the patients who were diagnosed as RT-PCR positive swine flu cases admitted (87.5%) were discharged successfully with death rate (1.3%) and 3% LAMA (left against medical advice).

+9 Thirty-two patients required hospitalization for various reasons, among these 8 children were having respiratory distress and required oxygen therapy, 22 children had high grade fever with cough and dullness, of these 2 patients required mechanical ventilation as well as vasoactive medications support for shock.

Table 1: Demographic profile of children with 2017 H1N1 Influenza (N=75)

Character	Number (%)
Males	45 (60%)
Females	30 (40%)
≤1 years	11 (15%)
1-5 years	45 (60%)
6- 10 years	14 (19%)
11-15 years	5 (6%)

Table 2: Clinical categorization of cases as per MOHFW GOI guide line

Category	Cases (%)
Category A	11 (15%)
Category b	56 (75%)
Category c	8 (11%)

Table 3: Clinical presentation of swine flu 2017

Symptoms	Total (n=75)	Percentage (%)
Fever	71	95%
Cough	65	87%
Vomiting	18	24%
Loose stools	7	9%
Loss of appetite	6	8%
Respiratory distress	8	11%
Headache	1	1.3%
Abdominal pain	1	1.3%
Convulsions	1	1.3%

5. Discussion

As of 10 January 2010, worldwide more than 208 countries and overseas territories or communities have reported laboratory confirmed cases of pandemic influenza (H1N1) 2009, including at least 13554 deaths [10]. But in the Indian subcontinent, there were more than 23727 laboratory confirmed cases with more than 782 (3.3%) deaths [9].

Antiviral drugs were administered to most of the patients (>95%), but such therapy was started generally more than 48 hours after the onset of illness in a majority of the patients. The interval between onset of symptoms and the initiation of oseltamivir was longer in children who were hospitalized than those who received ambulatory care, this is similar to that reported in other studies (11, 12). Due to non-specific symptoms children who had not received oseltamivir timely had high probability of hospitalization, thus adding to the impression of delayed administration of oseltamivir in hospitalized children. Secondly, being a tertiary care hospital, children referred from outside with severe illness (without obvious cause) were tested only after getting admitted to our hospital; there was a time gap for administration of oseltamivir after onset of illness.

While the risk factors/groups are not well defined for the 2017 H1N1 influenza, they are likely to be similar to those for seasonal influenza. Patients susceptible to severe disease are – those younger than 5 years and over 65 years of age, pregnant women, those with systemic illnesses, adolescents on aspirin, residents of nursing homes and immune suppressed. Among these, children younger than 4 years have the highest complication and death rates [12]. Pediatric data for severe disease includes: chronic respiratory illness including asthma, neuromuscular disorders, cerebral palsy, developmental delay, immunodeficiency, heart disease, and prematurity [12,13,14]. The preventive measures include: social distancing, prevention of infection in schools, practicing respiratory etiquette, use of facial mask, hand hygiene and use of chemoprophylaxis with antiviral drug.

In our hospital, majority of children (89%) presented with mild to moderate symptoms, 11% children had severe symptoms. 32/ 75 children required hospitalization for various symptoms. Most of the cases were discharged successfully; there was death of 1 child with confirmed H1N1 infection in our hospital due to respiratory failure.

Conclusion-All the swine flu RT-PCR positive cases do not require hospitalization for swine flu, with increasing awareness more and more number of children seek medical care for flu like symptoms due to fatalities reported in last few years. Home quarantine, hand hygiene, early referral to the hospital especially with severe symptoms and increasing media publicity about swine flu are important than treatment itself.

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