H3N2 Emergence in India

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Abstract: Influenza a pandemic in 2009 was predominantly by H1N1strain, however in the current seasonal outbreak H3N2 is more prevalent in North America, Europe and Eastern Asia. However very few cases have been reported from India. We report a case of 5-year-old girl child with H3N2 infection with acute onset and rapid progression. It is essential to deploy extensive surveillance in areas of low reporting to estimate the burden of the disease and to assess the changing demographics of the infection.

Keywords: Influenza A, H3N2, pediatric age group, mortality, increased surveillance.

1. INTRODUCTION

Infection with Influenza present most commonly with fever, cough, cold or mild respiratory distress with majority of the cases resolving without complications.

In the 2009 pandemic caused by H1N1 majority of the patients had mild symptoms but severe respiratory distress and mortality were also reported [1]. This pandemic resulted in reassortant influenza viruses in herds of swines of both H1N1 and H3N2 which caused infection by these strains in humans [2].

Since then there has been a steady increase in the number of H3N2 cases from the United States and East Asian countries.

However not many cases are reported from India and we report a case of acute onset of H3N2 with rapid deterioration in a 5 year old previously healthy child.

2. CASE REPORT

A 5 years old female child weighing 14kg, 110cms height, came to our hospital with history of fever, cough and cold of 2 days duration who developed respiratory distress few hours prior to admission. The child was healthy prior to this episode and had no history of any chronic illness. She was delivered full term in a hospital and had an uneventful neonatal period with adequate weight gain.

At the time of admission the child was conscious, oriented, afebrile with of heart rate of 104 beats/min, respiratory rate 76breaths/min, with subcostal and intercostal retractions, bilateral wheeze, oxygen saturation 94%, temperature of 37.8 degree Celsius. The child was put on oxygen and nebulized with salbutamol, following which was given hydrocortisone for worsening distress. She was started on injectable third generation cephalosporin as per the unit protocols and baseline blood investigations and chest x-ray was done. The chest x-ray revealed right sided infiltrates and prominent bronchovascular markings.

Despite these measures she continued to have respiratory distress. The child deteriorated within 16hrs with respiratory rate of 100breaths/min, antibiotics were hiked to second line and a repeat chest x-ray advised in view of the worsening distress.

Chest x-ray revealed bilateral infiltrated and Arterial blood gas of ph 6.7, pCo_2 70mm of Hg, pO_2 36mm Hg, saturations 25%, Hco3 13mmol/L.

Blood investigations revealed total leucocyte count of 5000/cumm with 80% leucocytes, hemoglobin 11.2gm/dl, and platelets 2lacs/cumm.

The child was mechanically ventilated and on clinical suspicion of swine flu tablet oseltamavir was added, throat swab culture was sent for influenza A.

However the child succumbed to the disease and expired after 32 hours of admission. The throat swabs culture was reported positive for H3N2 2 days later. An autopsy was not performed for this child.

3. DISCUSSION

The last pandemic of Influenza occurred in 2009 and the most prevalent circulating pathogen was influenza A (H1N1) which had a case fatality of about 11.3% according to a study by Elena et al. and was similar to other studies at the time [1]. The other common strain of influenza A known to be able to cause such an outbreak is H3N2, which has been

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circulating since 1968 but its prevalence was low, with H1N1 being the prime culprit [3].

In a comparative study from France the H1N1 pandemic had the maximum fatality in the age group between 5-24 years. In this age group respiratory and cardio-respiratory death rates were 10.6 to 14-fold higher than those of seasonal epidemics and 2 to 4-fold higher than those of the most severe A/H3N2 epidemic in 1999-2000 [4].

However our case had a very acute onset in a previously healthy child and rapid progression with death resulting despite early institution of oseltamavir.

There has been a steady emergence of H3N2 since 2009 and several cases have been reported but not many case fatalities were associated with it [1].

Globally the incidence of H3N2 has increased in this season, with H3N2 dominating North America and Europe. IN Western Asia influenza A is more prevalent while in central Asia influenza activity remained low.

However in Central Asia influenza A H3N2 is predominating, but these data are primarily from China, Japan and Mongolia, with very limited data from India [5]. The WHO GISRS laboratories tested more than 111 964 specimens. 27 176 were positive for influenza viruses, of which 17 711 (65.2%) were typed as influenza A and 9464 (34.8%) as influenza B. Of the sub-typed influenza A viruses, 3383 (33.9%) were influenza A(H1N1)pdm09 and 6594 (66.1%) were influenza A(H3N2).

Antigenic characterization of the recent A (H3N2) revealed a difference from the A (H3N2) virus used in the influenza vaccines for the northern hemisphere 2014-2015 [5].

Children experienced an estimated rate of death due to pH1N1 of 1.7 (range: 1.2-2.5) per 100 000 which was about 8 times higher than the previous years [6].

Children less than 5 years of age are at risk for influenza as are patients with cardiac diseases, chronic lung diseases, neurological diseases and during pregnancy [1].

Extensive surveillance needs to be deployed in the Asian countries to estimate the burden of disease in the continent and to predict any emergence of resistance strains.

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