H1N1 Encephalopathy

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Abstract

The 2009 pandemic influenza A (H1N1) has been recognised to cause neurological complications including seizures and encephalopathy. Reporting a 16 year old girl admitted to Bidar Institute of Medical Sciences Hospital (BRIMS), with H1N1 encephalopathy, during pandemic H1N1 2009.

Introduction

The influenza virus, known to be circulating as a pathogen in the human population since at least the 16th century is notable for its unique ability to cause recurrent epidemics and global pandemics. In April 2009 a novel influenza A (H1N1) virus reported in Mexico and the United States later spread worldwide, led the WHO to declare a pandemic. In India, from may 2009 till 26th December 2010, 202790 persons have been tested for Influenza A H1N1 and 46131(22.8%) were positive with 2728 cumulative deaths. Globally two peak incidences have been reported in mid September and mid December with peak age between 5-39 years age and more males.

Apart from exacerbation of underlying chronic disease, pulmonary, and cardiac complications of H1N1 influenza, also cause seizures, encephalopathy, and status epilepticus. To alert clinicians towards neurological complications of H1N1 infection, reporting this case of H1N1 encephalopathy.

Case Report

A 16 year old girl without prior neurological or other underlying illness presented to Bidar Institute of Medical Sciences (BRIMS) Hospital with history of running nose, mild degree fever, headache and vomiting once or twice, since 4-5 days, had high grade fever and altered sensorium since 4:00 am prior to admission. There was no history of seizures.

Examination: She was Febrile 102.0°F (38.9°C), confused with a Glasgow coma score of 12/15, markedly slow and intermittent response to commands, normal pupillary and extra ocular reflexes, normal fundus, no focal/lateralising neurodeficits, flexor plantars and no nuchal rigidity. Her respiratory examination revealed congested nasopharynx, normal breath sounds bilaterally and no adventitious sounds, oxygen saturation was normal with pulse oximeter on room air. Other examination normal.

Investigations: She had mild anaemia, neutrophilic leucocytosis and negative for malarial parasite, Widal test and HIV. Normal Urine analysis. Blood sugar 99 mg/dl, normal renal, liver function tests and electrolytes. Cerebrospinal fluid (CSF) was colourless, clear, normal pressure, protein 18 mg/dl, glucose 58 mg/dl, total cell count 5 cells/cu.mm, differential count showing lymphocytes 80% and monocytes 20%, no organism seen on gram stain and acid fast stain. Additional virological studies for enteroviruses, varicella zoster, herpes simplex, cytomegalovirus and Epstein-Barr virus could not be done due to financial constraints. A throat swab specimen for H1N1 by RT PCR at NIMHANS Bangalore (NIMHSW-5885) was positive for H1N1. Chest radiograph and Computed tomographic (CT) scan brain were normal, satisfying criteria for H1N1 encephalopathy defined as altered mental status lasting ≥ 24 hours, having laboratory-confirmed novel influenza A (H1N1) virus infection of the respiratory tract within 5 days of ILI (influenza like illness) symptom onset, without evidence of an alternative aetiology.

Patient was treated symptomatically along with broad spectrum antibiotics and Oseltamivir 75 mg bid. She became afebrile after 48 hrs and fully regained consciousness on third day. At discharge patient was asymptomatic without neurological sequelae.

Discussion

Despite being relatively mild for the majority of those it infected, the novel H1N1 virus – at least in a small percentage of victims – showed unusual, and sometimes severe, symptoms. The difference between the pandemic virus and seasonal influenza of the past has been the age shift in infections, hospitalisations, and deaths. H1N1 affects more under 65 years age.

Beyond the gastro-intestinal and pulmonary symptoms, the Center for Disease Control’s Morbidity and Mortality Weekly Report (CDC’s MMWR) reported 4 paediatric patients with the novel H1N1 virus who presented with neurological symptoms including unexplained seizures and altered mental status, which are comparable to our case of H1N1 encephalopathy.

In a retrospective study of 303 children, 18 children with 2009 H1N1 influenza and neurological complications when compared to seasonal influenza, seizures, encephalopathy, and status epilepticus were common presentations. 22% focal neurological symptoms persisted at discharge. Pandemic 2009 influenza were more likely to have encephalopathy, focal neurological findings, aphasia, and abnormal electroencephalographic findings. A trend was noted toward heightened neurological complications following second wave influenza activity.

The presence of ≥ 2 of either altered mental status, hypoxia (PaO2/FiO2 ≤ 250), bilateral lung infiltration, and old age (≥ 65 yr) were found, powerful and easy-to-use predictor of the severity in adult patients hospitalised with pandemic influenza A (H1N1) 2009.

The aetiology of neurological complications in influenza infection is unclear, and some authors suggest an indirect autoimmune reactivity, toxic phenomena of viral proteins, Cytokines released from respiratory tract inflammation and Non-permissive viral infection of systemic organs (brain, liver, muscle, heart and inner ear).

Neuraminidase inhibitors Oseltamivir and zanamivir in
treatment of children with seasonal influenza provide a small benefit by shortening the duration of illness and reducing household transmission. Their effects on the incidence of serious complications, and on the current influenza A H1N1 strain remain to be determined. Statins used by patients aged more than 18 years for cardiovascular disease reduced mortality possibly by inhibiting cell-signaling pathways in cytokine production. The absence of proven treatments for influenza related neurological complications underlines the importance of vaccination, although neurological complications can result from vaccination as well.

The age distribution of laboratory-confirmed pandemic deaths, has a mean of 37 years and the study concluded that the 2009 influenza A H1N1 pandemic virus had a substantial health burden in the US over the first few months of circulation, justifying the efforts to protect the population with vaccination programmes. From analysis of historic records it is suggested that the emerging pandemic virus will continue to circulate and cause excess mortality in unusually young populations for the next few years.

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