

Case Report

CNS INVOLVEMENT BY NOVEL INFLUENZA VIRUS TYPE A (H1N1), THE FIRST REPORT FROM IRAN

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Abstract

Objective

This is the first report of CNS involvement by the new influenza virus (influenza A [H1N1]) in Iran. The patient was a 10-year-old boy with chief complaints of fever, malaise, and cranial nerve involvement, resulting in respiratory muscle paralysis and intubation. This shows that the new influenza virus, as well as the seasonal flu, can cause neurologic complications; however, the severity of the signs and symptoms is less and the disease may resolve without complications in the case of seasonal flu. Therefore, in each patient with neurologic involvement and typical influenza signs & symptoms or a flu-like syndrome, diagnostic tests for H1N1 flu virus should be considered, especially during epidemics, and treatment with oseltamivir should be started.

Keyword: Novel influenza virus type A (H1N1), Brainstem encephalitis, Influenza virus

Introduction

In April 2009, WHO received new reports of a new influenza virus (H1N1- influenza A virus) which had recently been widespread (1,2,4,5,6). At first, the virus was named swine flu because it was said that the disease was endemic in the pigs of North America (2-7). However, it became then clear that the virus was formed by the re-arrangement of the previously known types of the flu virus (one endemic for human beings, one endemic for birds, and 2 endemics for pigs) (2-8). Newer evaluations showed that, in fact, the source of the disease was unknown. The symptoms of this disease were the same as the seasonal flu and other flu-like syndromes, including fever, cough, sore throat, malaise, pain all over the body, headache, chills, and fatigue (2-9). Neurologic symptoms, including seizures, encephalitis, and encephalopathy, are very rare complications of the disease that have been limitedly reported (3). In our case, which was the second case of CNS involvement by H1N1 flu virus worldwide and the first case reported in Iran, brain involvement manifested itself as encephalitis.

Case Report

The patient was a 10-year-old boy who was referred to a medical center in Chabahar in August 2009 because of peripheral facial palsy, swallowing difficulty, and inability to keep his head in a straight position. Chabahar is a city located in the southeast of Iran, near Oman Sea. On primary examinations, the patient was febrile and left-side peripheral facial palsy, sialorrhea, and cervical flexor muscle

paralysis were evident. The patient was fully conscious, deep tendon reflexes were symmetrical and normal or mildly decreased (1+), muscle tone was decreased and muscle force was 3/5. The pupils were reactive but the gag reflex was impaired. Symptoms began 7 days earlier with fever, buccal lesions, and severe weakness.

Past medical history was unremarkable with normal psychomotor development. His family history was unremarkable. His father worked on a ship and traveled frequently to the Persian Gulf countries. One day after hospitalization, the patient was intubated because of respiratory muscle paralysis. He was still conscious at that time and tolerated the intubation tube well because of the loss of the gag reflex. Six days after hospitalization, the patient was referred to the pediatric neurology ward of Mofid Children Hospital in Tehran. On admission, he experienced a generalized tonic clonic seizure (likely due to hypoxia because of a clot in the intubation tube).

He was re-intubated immediately. On primary examination, he still had the previous signs and symptoms. Considering the patient's state of consciousness, cranial nerves (X, IX, and VII) involvement, and normal brain Computed Tomography scan, the diagnosis of brain stem encephalitis was suggested. Routine lab tests were normal. Two lumbar punctures were performed which were normal. After 6 days, he had spontaneous breathing and was therefore extubated. Brain Magnetic Resonance Imaging was performed, showing a hyperintense lesion in T2-weighted radiographs in left lateral myelencephalon (Figure 1).

The tests for H1N1 influenza were reported to be positive. These tests detected the virus in nasopharyngeal secretions using PCR (Polymerase chain reactions) method; however, due to the long interval between the onset of the symptoms and diagnosis, and considering the patient's improvement, Oseltamivir was not prescribed. This was the first case of brain stem encephalitis in Iran and the second case of encephalitis after H1N1 influenza worldwide.

Discussion

This influenza virus (A type, H1N1 flu virus), which is in fact a new re-arrangement of some other influenza A viruses, shows clinical manifestations of the seasonal

influenza such as sore throat, headache, and myalgia (2). Neurologic complications have already been reported in the seasonal influenza including seizure, encephalitis, encephalopathy, and Reye syndrome (3,10,11).

We could only find 4 cases with neurologic complications due to H1N1 virus in the literature review (3). These four children were between 7 and 17 years of age and they were all referred with common manifestations of influenza in addition to seizure and/or decreased level of consciousness and abnormal EEGs. Furthermore, H1N1 influenza virus was detected in their nasopharyngeal samples; however, CSF samples were negative for this virus in these patients. Oseltamivir and Rimantadine were administered for 4 and 3 patients in the mentioned study, respectively. All patients were treated and discharged from the hospital without any neurologic sequelae (3). The aforementioned shows that new influenza virus, as well as the seasonal influenza virus, can result in neurologic complications. However, the rate of such complications with these two virus types is not clearly determined.

The severity of these complications is less than that reported by the typical seasonal flu (3,10,11). These fatal complications of the seasonal flu include fatal encephalopathies and acute necrotizing encephalopathy of the children (ANEC) (10-11,12). In our case and in the CDC report, the neurologic complications were less severe and completely resolved later. In encephalopathies due to influenza, neuro-imaging modalities are generally normal. In severe cases, however, generalized cerebral edema and bilateral thalamus lesions have been reported (3-10-11,12). In our patient, a focal lesion was reported in myelencephalon which has not been reported to date. Medulla is a part of brainstem. The brainstem is responsible for all vital functions. It is divided into the following areas, which are responsible for specific function:

- Medulla: sleep, breathing, heartbeat, digestion, activation of higher forebrain functions.
- Pons: sleep, breathing, motor control, activation of higher forebrain functions.
- Midbrain: walking, posture, head and eye movement (14).

In our patient, the site of involvement was in medulla

in the brainstem. In such situations, the greatest practical challenge for the physician is to maintain vital functions in the acute stage of brainstem encephalitis. With the present capacity of physiologic support and the close observation offered in intensive care units, such patients may be tided over the acute phase (15), as in our patient who was discharged from hospital without any squeals.

In all cases, neurologic involvement due to influenza is seldom accompanied by changes in CSF which shows the indirect effect of the virus on the respiratory system

(3-10-13). Thus, we suggest that in all patients with respiratory and neurologic symptoms, diagnostic tests for seasonal influenza and new H1N1 influenza virus be performed, especially during epidemics and outbreak, and antiviral treatment be started (3). Moreover, in highly suspicious cases, treatment should not be postponed. In our patient, the test results were available 10 days after the onset of the disease when the patient was recovering; however, no neurologic sequelae were reported in our patient.

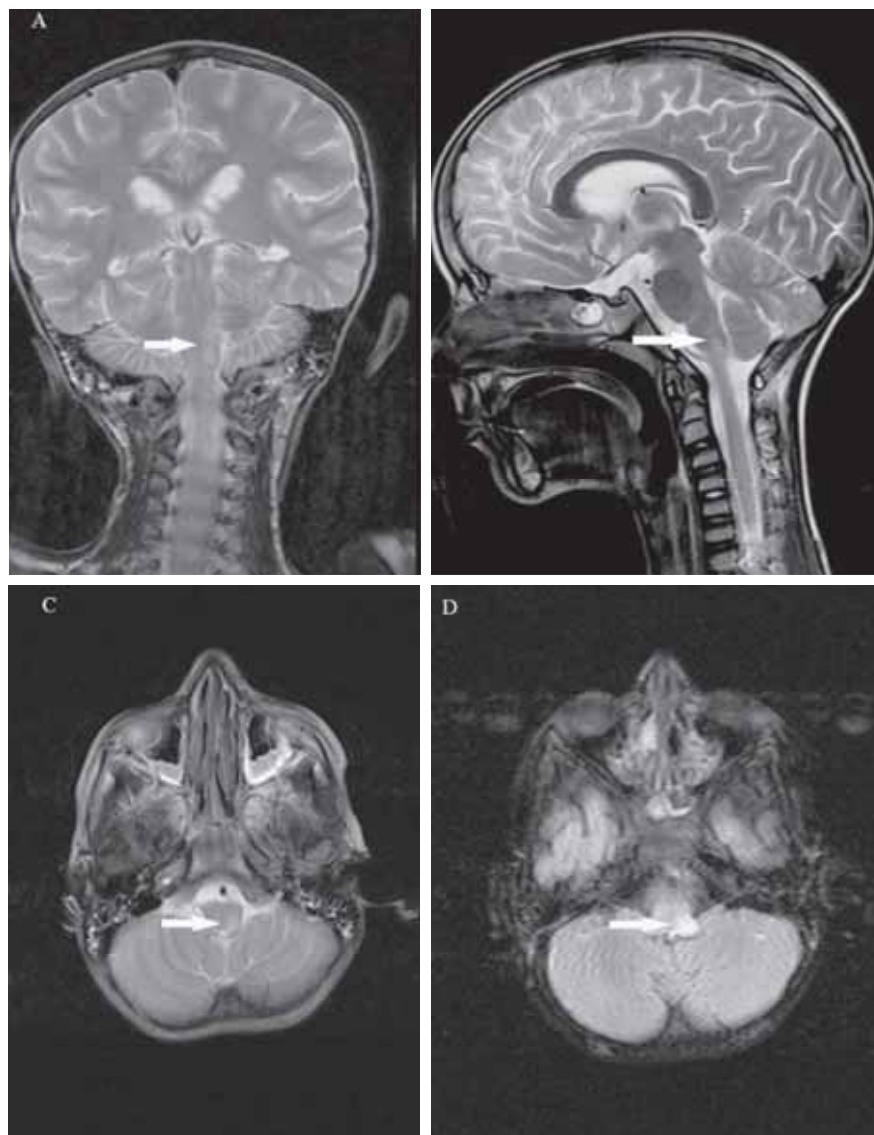


Fig1. Hyperintense lesions on the left lateral part of medulla in brain MRI images of the patient. A: T2-Weighted, coronal. B: T2-weighted, sagittal. C: T2-weighted, axial and D: Flair axial

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