

Pneumonia Complicated by Transient Encephalopathy: Unusual Presentation of Adenovirus

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Abstract

Adenovirus is a common virus that usually affects children. It is mostly associated with respiratory or gastrointestinal diseases and rarely causes neurological manifestations. In this case we describe a 2-year-old girl with adenovirus pneumonia complicated with transient encephalopathy.

Keywords Adenovirus; Encephalopathy; Fever; Pneumonia; Viruses

Introduction

Adenoviruses are a family of viruses that are an important cause of febrile illnesses in the pediatric population. They are most frequently associated with upper respiratory tract syndromes. Less commonly, adenoviruses cause gastrointestinal, ophthalmologic, genitourinary, and neurologic diseases [1].

Adenovirus infections spectrum of illness can range in severity from subclinical or self-limited to severe, life-threatening disease. Severe disease occurs usually in infants, immunocompromised patients, or those with underlying chronic disease [2,3].

Adenovirus has Fifty-one serotypes. Approximately 15 serotypes of these can cause human disease [4]. There are variations among those serotypes clinically and epidemiologically. For instance, Serotypes 3 and 7 frequently cause respiratory illness, whereas serotypes 40 and 41 are usually linked with acute gastroenteritis [5-7].

The term encephalopathy is used to describe a diffuse disorder of the brain in which at least 2 of the following symptoms are present: 1) altered state of consciousness; 2) altered cognition or personality and 3) seizures [8].

There have been few reports on encephalopathy caused by this virus. However, none of the cases of adenovirus associated encephalopathy have been reported from Saudi Arabia. We report the first case of adenovirus associated with encephalopathy from Saudi Arabia.

Our report concerns a girl who simultaneously became ill with Adenovirus pneumonia complicated with encephalopathy, and who recovered completely without sequelae.

Case Report

A previously healthy 2 year old girl presented with two weeks history of low grade fever which was associated with cough and runny nose. After admission to the hospital she was constantly febrile. Chest X-ray showed left sided pneumonia. She subsequently developed

lethargy, excessive sleepiness then progressed to encephalopathy. Her fever was high grade reaching up to 40 despite IV antibiotics. Furthermore, she developed two attacks of generalized convulsions.

Interestingly, before 2 weeks her sister also had upper respiratory tract infection with prolonged fever subsided after 1 month spontaneously but with normal consciousness level.

Mother denied any history of skin rash or peeling, diarrhoea or vomiting, Joint swelling or pain, eye redness or discharge.

Upon examination she looked sleepy connected to O₂ by nasal cannula 2 L/minute. Her throat examination showed follicles over an injected tonsil with normal ear exam. Chest examination showed equal air entry, with crepitation mainly on the left side. Meningeal signs were negative. Glasgow coma scale was 12 to 13 out of 15 with normal Tone Deep tendon reflexes.

Results of laboratory Investigations showed normal CBC (WBC 8.40, mainly Lymphocytes 55%, Platelet 238). CRP and ESR were high 144 mg/l, 108 respectively. Liver function test showed mildly elevated liver. CSF analysis was normal (WBC 1, RBC 4) with normal CSF glucose and protein level. CSF culture was negative. CSF was also sent for HSV and Enterovirus PCR and they were negative. Cultures from blood, urine and throat were all negative. As part of workup for fever of unknown origin, the following was done and were all negative EBV and CMV serology, Brucella serology, PPD skin test. Brain CT and MRI were normal. Nasopharyngeal specimen sent for respiratory multiplex PCR looking for respiratory viruses was positive for Human Adenovirus but disappointingly we didn't have the facility to do the serotyping in our hospital.

Fortunately, by the fourth week of illness the fever subsided and she slowly regained her consciousness level and showed complete recovery.

Discussion

Adenoviruses are well known double standard, non-enveloped DNA viruses. There are up to 51 serotypes that are divided into 7 species from A through G which all can infect humans. Adenoviruses in general do not show seasonal variation and infect throughout the year,

subtypes seasonal variation is not well studied. Adenoviral infected individuals are most infectious during the first few days of an acute infection, but shedding of the virus can persist for months [9].

Adenovirus DNA Polymerase chain reaction assays are now replacing other diagnostic tests because of better sensitivity and availability [10], however prolong viral shedding can affect the interpretation of a positive test result. Adenovirus serotyping is not easily available in most institutes [9].

Adenovirus types that are mostly associated with respiratory tract disease (types 1-5, 7, 14, and 21) and others are mostly associated with gastroenteritis (types 40 and 41) [9]. Adenoviruses are also known to cause neurological complication including meningitis, meningoencephalitis, aseptic meningitis and some reported cases of flaccid paralysis [11]. These neurological complications are sometimes associated with disseminated adenovirus diseases that are far more common in young children and immunocompromised individuals [3].

Now for the past two decades there are few reported cases similar to the patients in our report [12,13]. Most of these cases presented with high grade fever, respiratory symptoms and some had vomiting and diarrhea. Further radiological imaging showed bronchopneumonia, the patients gradually started to be lethargic with decrease in GCS to as low as 9, most had no seizures [12] while others reported to have multiple attacks of seizures [13] which is similar to our patient who developed multiple generalized seizures, progressive neurological deterioration inform of lethargy, decrease level of consciousness with GCS declining to 9/15 and EEG finding of generalized slowing which is also was found in some of the reported cases [12].

This collection of symptoms with positive adenovirus was called by a 2001 article [12] as “Transient encephalopathy associated with adenovirus infection” which is diagnosed by positive adenovirus PCR or DFA either by sputum, conjunctiva and rectal swaps; with the exclusion of all other more sever neurological complication. This syndrome has a good outcome and usually a complete resolution of the neurological symptoms as our patient. Ohtsuki et al. reported that pulse steroid was given to one patient and showed improvement which suggests a pathogenesis of post infectious encephalitis [13].

The exact pathophysiology of this syndrome is yet to be understood. A better understanding of this syndrome will lead to faster diagnose and clear mode of management.

Conflict of Interest

The authors declare that they have no competing interests.

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