

The first report of West Nile virus infection in a child from Turkey

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Seroprevalence data indicate that West Nile virus (WNV) activity is present in Turkey; however, no pediatric cases of WNV infection have been reported to date. WNV is an emerging flavivirus in Turkey, and in September 2010, the Turkish Ministry of Health reported the first seven cases of laboratory-confirmed WNV infection from five different cities in the western part of the country. This is the first report of a child from central Anatolia, indicating the existence of the virus in other regions of the country.

Key words: West Nile virus infection, Turkey, child.

West Nile Virus (WNV) infection is an arthropod-borne infection leading to a broad range of manifestations from uncomplicated febrile illness to meningitis, neuropathies, paralysis, and encephalitis in children¹⁻³. No pediatric cases of WNV infection have been reported from Turkey to date. Herein, we report a child with systemic findings of a viral disease to emphasize the importance of WNV infection in the differential diagnosis of children with febrile illness, rash and neurologic findings.

Case Report

An 11-year-old girl with complaints of abrupt-onset fever, abdominal pain, diarrhea, fatigue, difficulty in walking, dizziness, and eruption on the hands and feet was admitted to the pediatric emergency department. She was working as a seasonal worker in Polatlı, a town in central Anatolia. Her body temperature was 38.7°C, heart rate 80/minute, respiratory rate 24/minute, and blood pressure 110/70 mmHg. On her physical examination, oropharyngeal hyperemia, tonsillar hypertrophy, hepatomegaly, bilateral edema on hands, and rash on her trunk and on the upper and lower extremities were detected. Hematological investigation revealed hemoglobin 12.1 g/dl, white blood cell count 12,100/mm³ (90% neutrophils, 10% lymphocytes) and platelet count 208,000/mm³.

Erythrocyte sedimentation rate was 86 mm/h and high-sensitive C-reactive protein was 2.12 mg/dl. Aspartate aminotransferase and alanine aminotransferase levels were 32 U/L and 94 U/L, respectively. Total bilirubin was 3.25 mg/dl and direct bilirubin was 1.65 mg/dl. Prothrombin and partial thromboplastin time, renal functional tests, lactate dehydrogenase (LDH) and creatine phosphokinase (CPK) levels were normal. Urinary analysis revealed 3+ leukocyte and + nitrite, and there were 20-25 leukocytes on microscopy. The patient was hospitalized in the pediatric infectious diseases department with the provisional diagnosis of urosepsis, hepatitis, systemic viral infection, and systemic vasculitis. Intravenous ceftriaxone treatment was started after urine and blood cultures were obtained. On her follow-up on the third day of hospitalization, fever continued and rigorous headache and vomiting occurred. Since neck stiffness and other meningeal irritation symptoms were positive, lumbar puncture was done. Examination of cerebrospinal fluid analysis was found to be normal. Serological markers for Epstein-Barr virus, cytomegalovirus, parvovirus B19, toxoplasmosis, hepatitis A and B viruses, human immunodeficiency virus (HIV), Lyme disease, salmonella, and brucella were all negative. Mycoplasma polymerase chain reaction (PCR) was also negative. C3

and C4 were in normal levels, and antinuclear antibody and anti-double strain DNA antibody were negative. Echocardiography, which was done for the possible cardiac finding of a systemic or viral disease, showed minimal pericardial effusion. The coronary arteries were found to be normal. Abdominal ultrasonographic examination showed minimal hepatosplenomegaly. Because of the suspicion of WNV infection based on her findings of fever with rash and neurologic symptoms, a serum sample was sent to the National Reference Laboratory (Institute of Refik Saydam Hifzisihha) in Ankara, and diagnosis of WNV infection was confirmed with serological test. PCR analyses for Crimean-Congo hemorrhagic fever and enteroviral infection were negative. Blood, urine and cerebrospinal fluid cultures did not demonstrate any infectious agents, and ceftriaxone was discontinued on the 7th day of hospitalization. On follow-up, her fever and rash resolved within 4 days, but headache and vomiting resolved gradually over 7 days. On discharge, her physical and laboratory findings were all normal. The patient was discharged on the 10th day with no complaints.

Discussion

West Nile Virus (WNV) is an arthropod-borne flavivirus and was isolated in 1937⁴. Since that time, the virus caused epidemics in different parts of the world. Infections occurred in America, Asia, Africa, and Europe and particularly in countries bordering the Mediterranean Sea^{4,5}. The virus is the most widely distributed flavivirus in the world, and many sporadic cases or major outbreaks of West Nile fever have been reported worldwide⁶. However, WNV infections have not been well documented in Turkey. Exposure to WNV is confirmed only in seroprevalence studies in blood donors and in patients with central nervous system infections of unknown etiology⁷⁻⁹.

Although seroprevalence data indicate that WNV activity is present in Turkey, there had been no reported cases of WNV infection until this year. In September 2010, the Turkish Ministry of Health reported that patients who presented to hospitals with complaints of fever, rash and central nervous system involvement in the western part of the country were diagnosed

as WNV infection; furthermore, three of the reported patients died. Awareness of the disease led us to examine the current patient for WNV infection. Although the patient was well after 10 days of hospitalization, we think that awareness is important to prevent any unnecessary investigations. Currently, there is no established treatment for WNV infection⁴. Prevention and control are the only measures that help to decrease the associated morbidity and mortality, so more research is needed on the epidemiology, pathogenesis and treatment of this disease.

The virus may cause a variety of clinical symptoms in humans. Mild febrile illness, meningitis, encephalitis, acute flaccid paralysis manifesting as a Guillain-Barré-like syndrome, or even death may occur. WNV disease in children is typically mild, but severe neurologic disease, sometimes resulting in persistent neurologic sequelae, has been reported^{3,10}. The first isolation of the virus in children was from the brains of three children who died of encephalitis within the same state in India in the early 1980s¹¹. Since then, WNV infections among children are generally thought to be asymptomatic or to result in mild illness. However, in a large series of pediatric WNV cases, 30% were classified as West Nile neuro-invasive disease (WNND), 68% were classified as West Nile fever, and 2% were of unknown clinical presentation. It has been shown that WNND is more likely to manifest as meningitis in contrast to the predominance of encephalitis among older adults¹. The other most common clinical findings among children are fatigue, headache, generalized weakness, myalgia, maculopapular rash, and gastrointestinal symptoms. Myocarditis, hepatitis, chorioretinitis, and vitreitis have also been described as complications of WNV infections among children^{1,10}. Our patient exhibited the typical clinical signs and symptoms of WNV infection.

The seasonality and clinical features of enterovirus (EV) infections may overlap with those of WNV, so EV should almost always be included in the differential diagnosis of such cases. In a study comparing these two infections, WNV infection was more likely to cause heart disease, rash and cranial nerve palsy. There was also a trend towards more

neurological findings with WNV infection¹². However, there are no consistent differences in the features of WNV infection and enteroviral viremia, so diagnostic tests for both viruses should be performed. A confirmed diagnosis of a viral infection can prevent unnecessary investigations, antimicrobial treatment, hospital admission, and prolonged hospitalization.

This is the first time that WNV infection has been documented in a child in Turkey. It is important that clinicians recognize the clinical features of viral illnesses so that appropriate virological investigations are requested. With the advent of rapid diagnostic tests, WNV should be considered especially in the differential diagnosis of pediatric patients presenting with febrile illness, rash, hepatitis, myocarditis, and neuro-invasive disease.

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