CASE REPORT

DENGUE HEMORRHAGIC FEVER WITH ENCEPHALOPATHY IN AN ADULT

Verajit Chotmongkol and Kittisak Sawanyawisuth

Department of Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

Abstract. Encephalopathy in dengue hemorrhagic fever is a very rare condition and usually occurrs in the febrile stage. We report a 29-year-old woman, who presented with acute fever, thrombocytopenia and positive IgM antibodies for dengue virus. On the fourth hospital day, the fever subsided and she developed a confusional stage. CT scan and MRI of the brain were within normal limits. Electroencephalography (EEG) revealed generalized theta waves. Cerebrospinal fluid was normal. She was treated with supportive treatment. Five days later, she was fully recovered without any neurological deficits. This is a first case of encephalopathy in dengue hemorrhagic fever that developed after the fever subsided.

Dengue infection is the most important arboviral infection in Southeast Asia. It is a disease predominantly of children and presents with asymptomatic infection, undifferentiated fever, dengue fever and dengue hemorrhagic fever (DHF). Encephalopathy associated with dengue infection is considered to be a rare condition, especially in adults. All cases experience the neurological manifestations during the febrile stage of the illness (Kankirawatana *et al*, 2000; Solomon *et al*, 2000; Cam *et al*, 2001; Pancharoen and Thisyakorn, *et al*, 2001). We present an adult patient with DHF who developed encephalopathy after the fever subsided.

A 29-year-old previously healthy woman was referred to the hospital on September 16th, 2002 for evaluation of an acute onset of encephalopathy. On September 13th, 2002, she was admitted to a private hospital with the chief complaint of fever, myalgia, vomiting and diarrhea for 3 days. Physical examination showed an alert woman with a body temperature of 38.5ºC and no other abnormal findings. Laboratory investigations are shown in Table 1. DHF was suspected and she was treated with intravenous fluid therapy and other supportive treatment. On September 16th, the fever subsided but the patient became drowsy and confused (Glasgow coma score = 13). Laboratory findings are shown in Table 1. Serum calcium and magnesium were within the normal range. Serum HBsAg, HBsAb, anti-HCV and anti-HIV were negative. Serum VDRL and TPHA were non-reactive. CT scan and MRI of the brain were within normal limits. Electroencephalography (EEG) revealed generalized theta waves. The patient was treated with supportive treatment. On the next day, generalized petechiae were detected. On September 20th, her confusion improved dramatically. She was discharged with complete recovery. On follow-up September 28th, a lumbar puncture was performed after permission and showed a clear cerebrospinal fluid (CSF) with an opening pressure of 130 mm H_2O. The white blood cell count was 5 cells/mm^3. The protein level was 49 mg/dl and glucose level was 52 mg/dl (simultaneous serum glucose level of 80 mg/dl). CSF culture was negative. Laboratory investigations for dengue infection are shown in Table 1.

Our patient had a definite diagnosis of DHF from the clinical presentations, thrombocytopenia and positive serum dengue IgM antibody. This is a definite case of dengue infection because of the high titer of dengue IgG antibody. The patient experienced mental change for few days then

Correspondence: Verajit Chotmongkol, Department of Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand.
Fax: (66) 043 243064

Table 1
Clinical and laboratory findings in the patient according to date of admission.

Findings	Date of admission									
	13th	14th	15th	16th	17th	18th	19th	20th	21st	22nd	28th
Temperature (ºC)	38.5	38.5	38.2	37.0	36.5	36.8	37.0	37.1	36.5	36.5	37.1
Blood pressure (mmHg)	100/70	100/60	90/60	90/60	110/70	110/70	120/70	110/70	110/70	90/60	90/60
Consciousness	N	N	N	Abn	Abn	Abn	Abn	Abn	N	N	N
Platelet count (x 10^3/mm^3)	86	77	35	11	21	11	10	24	ND	197	340
Total bilirubin (mg/dl)	ND			1.1							0.9
Direct bilirubin (mg/dl)	ND			0.4							0.4
AST (U/l)	128			230							30
ALT (U/l)	103			116							33
Alkaline phosphatase (U/l)	65			38							54
BUN (mg/dl)	11			5.0							
Creatinine (mg/dl)	0.6			0.5							
Electrolytes	N			N							
Dengue IgM (blood)				Pos							Neg
Dengue IgM (CSF)											Neg
Dengue IgG (by HAI)				ND							#
JE IgG				1:320							1:320

AST = serum aspartate aminotransferase; ALT = serum alanine aminotransferase; N = normal, Abn = abnormal; Pos = positive, Neg = negative; ND = not done
# = DEN-2 Ab > 1:10,240; DEN-4 Ab > 1:10,240

had complete recovery.

The pathophysiology of dengue encephalopathy includes hyponatremia, hepatic encephalopathy from fulminant hepatic failure, hypotension, cerebral edema, microvascular or frank hemorrhage or encephalitis from dengue virus infection (Lum *et al*, 1996; Kankirawatana *et al*, 2000; Solomon *et al*, 2000; Cam *et al*, 2001; Pancharoen and Thisyakorn, 2001). Evidence of direct viral involvement of brain (dengue encephalitis) is based on focal neurological deficits, CSF pleocytosis, detection of IgM antibody or dengue virus isolated or detected by PCR in the CSF (Solomon *et al*, 2000). In our patient, the IgM antibody was not detected in the CSF because the CSF examination was performed in the late phase of the illness (supported by the disappearance of the serum IgM antibody in the convalescent titer), viral encephalitis should be the cause of the altered consciousness from the evidence of the EEG changes, mild elevation of CSF protein and no abnormal metabolic changes detected. In conclusion, DHF with encephalopathy can occur in the late stage of the illness when the fever has already subsided.

REFERENCES

Cam BV, Fonsmark L, Hue NB, *et al*. Prospective case-control study of encephalopathy in children with dengue hemorrhagic fever. *Am J Trop Med Hyg* 2001; 65: 848-51.

Kankirawatana P, Chokephaibulkit K, Puthavathana P, *et al*. Dengue infection presenting with central nervous system manifestations. *J Child Neurol* 2000; 15: 544-7.

Lum LC, Lam SK, Choy YS, *et al*. Dengue encephalitis: a true entity? *Am J Trop Med Hyg* 1996; 54: 256-9.

Pancharoen C, Thisyakorn U. Neurological manifestations in dengue patients. *Southeast Asian J Trop Med Public Health* 2001; 32: 341-5.

Solomon T, Dung NM, Vaughn DW, *et al*. Neurological manifestations of dengue infection. *Lancet* 2000; 355: 1053-9.