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CLINICAL ASPECTS OF WEST NILE VIRUS INFECTIONS IN HUMANS IN CROATIA

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Summary

During August and September of the year 2012th there were 5 patients with meningoencephalitis treated at Clinic of Infective Diseases, University Hospital Centre Osijek. In all of them West Nile virus was confirmed to be cause, serologically (ELISA IgG and IgM positive). These are the first confirmed cases of West Nile encephalitis in Eastern Slavonia, Croatia (Budimci, Vukovar, Belisće, Kuševac, Petrijevci). Patients ranged in age from 48 to 77 years. One year ago, three of these patients were treated in Neurology; two of them due to the stroke, and third because the vertigo. Patients were admited to the hospital on the 4th to 6th day from the begining of general infectious symptoms, and the first day of neurological symptoms. Two patients had confusion, disorientation and hallucinations, two patients had somnolence and sopor, and two patients had tremor. During first two days of treatment, all patients had raised body temperature in range from 37.2° C to 38.3° C. Cerebrospinal fluid analysis in all patients spoke in favor of serous meningitis. The number of leukocytes (mainly lymphocytes) ranged from 10 to 517 x10^6/L, there was a moderate protein elevation and marginal lactate elevation. Glucose and chlorides were within normal range. All patients had EEG changes dysrithmic, diffuse or laterally. CT scan of the brain was normal in two patients, two patients had diffuse brain atrophy, and one had chronic vascular lesions. MRI scan of the brain in two patients was normal. Patients were treated with anti-edematous therapy with infusion 10% Mannitol and 10% Dextrose and other symptomatic therapy. Clinical signs improved within 5 days of treatment. Hospitalization lasted 2-3 weeks. All patients were discharged without neurological sequelae.

Keywords: West Nile virus infection; meningoencephalitis; Eastern Slavonia; Croatia.

INTRODUCTION

About 80% of West Nile virus (WNV) infections are asymptomatic. Most WNV infections are mild and often clinically unapparent. Approximately 20% of those infected develop a generally mild illness (West Nile fever). The incubation period is thought to range from 3 to 14 days [1,2,3]. Symptoms generally last 3 to 6 days.

The mild form of WNV infection as a febrile illness of sudden onset often accompanied by: malaise, headache, anorexia, myalgia, nausea, rash, vomiting, lymphadenopathy, eye pain [4,5,6]. Symptoms occurring among patients hospitalized with severe disease include: fever, gastrointestinal symptoms, weakness, severe neurological disease. A minority of patients with severe disease developed a maculopapular or morbilliform rash involving the neck, trunk, arms, or legs [7]. Approximately 1 in 150 infections will result in severe neurological disease [7]. The most significant risk factor for developing severe neurological disease is advanced age [1].

Neurological presentations include: encephalitis, meningoencephalitis, meningitis, West Nile poliomyelitis, acute flaccid paralysis, ataxia, extrapyramidal signs, optic neuritis, cranial nerve abnormalities, polyradiculitis [4,5,8]. Encephalitis is more commonly reported than meningitis.

Signs and symptoms of neurological diseases include: high fever, severe headache, stiff neck, disorientation or confusion, sopor or coma, tremors or muscle jerking, lack of coordination, convulsions, pain, partial paralysis or sudden weakness [9,10]. Signs and symptoms of West Nile fever usually last a few days, but signs and symptoms of encephalitis or meningitis can linger for weeks, and certain neurological effects, such as muscle weakness, may be permanent.

Myocarditis, pancreatitis, and fulminant hepatitis have been rare described [11].

MATERIALS AND METHODS

Five patients with serologically confirmed West Nile virus infection and meningoencephalitis were analysed, according to following criteria shown in the table: age, sex, place of residence, personal anamnesis, tick bite, swimming in stagnant water, period of disease before hospitalization, highest body temperature, headache, vomiting, duration of neurological symptoms before hospitalization, photophobia, neck stiffnes, neurological symptoms, white blood cell count, platelet count, laboratory information on levels of alanine aminotransferase, aspartate aminotransferase, gamma-glutamyl transferase and urea, liquor white blood cell count, electroencephalography, CT and MRI scan of the brain, serological tests (ELISA - Enzyme-linked immunosorbent assay test).

RESULTS AND DISCUSSION

Data on our patients are shown in following six tables, sorted according to different criteria.

Table 1. Details from personal anamnesis in patients

Patient	Age (in years)	Sex	Place of residence	Personal anamnesis	Tick bite	Swimming in stagnant water
1. D.M.	48	F	Budimci	Vertigo	-	-
2. S.K.	77	F	Vukovar	Hypertension	-	-
3. P.B.	76	M	Belišće	Stroke, hypertension	-	-
4. R.V.	48	F	Kuševac	-	-	-
5. V.S.	65	M	Petrijevci	Hypertension, chr. radiculopathy, stroke	-	-

Table 2. General symptoms in patients

Patient	Period of disease before hospitalization (in days)	Highest body temperature	Headache	Vomiting
1. D.M.	4	38 ºC	+	+
2. S.K.	3	38,5 ºC	+	- (Nausea)
3. P.B.	3	38 ºC	+	- (Nausea)
4. R.V.	5	38,3 ºC	+	+
5. V.S.	6	38,5 ºC	+	+

Table 3. Neurological symptoms of patients

Patient	Duration of neurological symptoms before hospitalization (in days)	Photophobia	Neck stiffness	Neurological symptoms
1. D.M.	1.	+	+	Apathy, somnolence, sopor
2. S.K.	1.	+	+	Anxiety, irritability, hallucination
3. P.B.	1.	-	-	Anxiety, irritability hallucination, tremor
4. R.V.	1.	+	+	Apathy, somnolence
5. V.S.	1.	-	-	Tremor

Table 4. Blood analysis data

Patient	White blood cell count 3,4 – 9,7 x10^9/L	Platelet count 158 – 424x10^9/L	AST (11-38 U/l) ALT (12-48 U/l) GGT (11-55 U/l)	Urea 2,8-8,3 mmol/L
1. D.M.	5,0	214	AST 64, ALT 99, GGT 42	5,5
2. S.K.	11,0	190	AST 37, ALT 80, GGT 49	12
3. P.B.	5,1	143	Normal AST and ALT, GGT 94	13,2
4. R.V.	14,1	187	Normal value	6,2
5. V.S.	3,5	84	AST 51, ALT 65, GGT 41	5,8

Table 5. Diagnostic tests used

Patients/ Lumbar puncture done on day	Liquor white blood cell count $x10^6$/L	Electro-encephalography (EEG)	CT and MRI Scan of the brain
1. D.M. 14 .day	10 (ly 100%)	Diffuse dysrithmic	CT scan of the brain - normal
2. S.K. 1. day	517 (ly 15, mono 3, neutro 82 %)	Unilateral dysrithmic	CT scan of the brain - diffuse brain atrophy
3. P.B. 2. day	120 (ly 26, mono 9, neutro 65%)	Difusse dysrithmic	CT scan of the brain - diffuse brain atrophy MRI scan of the brain - Normal
4. R.V. 1. day	272 (ly 74, mono 19, neutro 16 %)	Unilateral dysrithmic	CT scan of the brain - normal
5. V.S. 12. day	17 (ly 75, mono 23, neutro 2%)	-	MR of the brain - chronic vascular lesion

Table 6. Serological test results

Patients	Day of disease when serum sample was taken	ELISA Positive >1,1 RU/mL IgM	ELISA Positive >22 RU/mL IgG
1. D.M.	21.	1,7	132
2. S.K.	15.	3,3	40
3. P.B.	6.	3,2	Neg
4. R.V.	13.	4,1	125
5. V.S.	8.	3,5	Neg

All patients were residents of different settlements from eastern Slavonia. Patients ranged in age from 48 to 77 years. Most of them had some chronic illness. Three of these patients were treated in Neurology; two of them due to the stroke, and third because the vertigo. During first two days of treatment, all patients had raised body temperature in range from 37.2º C to 38.3º C. Patients were admited to the hospital on the 4th to 6th day from the beginning of general infectious symptoms, and the first day of neurological symptoms. Two patients had confusion, disorientation and hallucinations, two patients had somnolence and sopor, and two patients had tremor. All of them had headache and most of them vomiting. Three patients had photophobia and neck stiffness. One had leukopenia, two thrombocytopenia and three elevated aminotransferase levels.

Cerebrospinal fluid analysis in all patients spoke in favor of serous meningitis. The number of leukocytes (mainly lymphocytes) ranged from 10 to 517 x10^6/L. All patients had EEG changes dysrithmic, diffuse or laterally. CT scan of the brain was normal in two patients, two patients had diffuse brain atrophy, and one had chronic vascular lesions. MRI scan of the brain in two patients was normal. Serum samples were collected 6th to 21th day of illnes, and in all patients West Nile virus was proved to be cause, serologically (ELISA IgG and IgM positive).

CONCLUSION

During August and September of the year 2012th there were 5 patients with meningoencephalitis treated at Clinic of Infective Diseases, Osijek University Hospital Centre. In all of them West Nile virus was confirmed to be cause, serologically (ELISA IgG and IgM positive). These are the first confirmed cases of West Nile encephalitis in Eastern Slavonia, Croatia (Budimci, Vukovar, Belisce, Kusevac, Petrijevci).

We showed clinical manifestations, neurological symptoms and certain laboratory tests in first patients with West Nile virus meningoencephalitis in Eastern Slavonia, Croatia.

Patients were treated with anti-edematous therapy with infusion 10% Mannitol and 10% Dextrose and other symptomatic therapy. Clinical signs improved within 5 days of treatment. Hospitalization lasted 2-3 weeks. All patients were discharged without neurological sequelae.

From now on, in differential diagnosis of patients with acute meningoencephalitis occuring during warmer months, West Nile virus infection must be taken in consideration.

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Sažetak

Klinička obilježja infekcije virusom Zapadnog Nila kod ljudi u Hrvatskoj

Tijekom kolovoza i rujna 2012. godine u Klinici za infektologiju KBC-a Osijek liječeno je pet bolesnika s meningoencefalitisom, u kojih je serološki (ELISA IgG i IgM pozitivni) dokazan virus Zapadnog Nila. To su prvi dokazani slučajevi meningoencefalitisa uzrokovanog virusom Zapadnog Nila u istočnoj Slavoniji (Budimci, Vukovar, Belišće, Kuševac, Petrijevci). Bolesnici su bili u dobi od 48 do 77 godina. Tri su se bolesnika godinu prije liječila na neurologiji: dva zbog cerebrovaskularnog inzulta, a treći zbog vertiginoznog sindroma. Hospitalizirani su od četvrtog do šestog dana prisutnih općih infektivnih simptoma, a prvog dana prisutnog poremećaja svijesti. Smetenost, dezorijentiranost i halucinacije imala su dva bolesnika. Somnolencija i sopor bili su prisutni također kod dva bolesnika, a kod dva bolesnika bio je prisutan i tremor.

Povišenu temperaturu svi su bolesnici imali prva dva dana liječenja i ona je iznosila od 37,2 °C do 38,3 °C. U svih je bolesnika nalaz likvora govorio u prilog seroznog meningitisa. Broj leukocita (pretežno limfocita) varirao je od 10 do 517 x10^6/L. Prisutna je bila umjerena proteinorahija i granično povišene vrijednosti laktata. Glukoza i kloridi bili su u granicama normale. U svih bolesnika EEG je bio dizritmički promijenjen, difuzno ili postranično. CT mozga bio je uredan kod dva bolesnika, kod dva bolesnika bila je prisutna difuzna atrofija mozga, a kod jednog kronična vaskularna lezija. Nalaz MR-a mozga kod dva bolesnika bio je uredan. Uz antiedematoznu terapiju (infuzije 10% manitola i 10% dekstroze) i drugu simptomatsku terapiju, unutar pet dana liječenja uslijedilo je poboljšanje. Bolničko liječenje trajalo je 2 – 3 tjedna. Svi su otpušteni bez neuroloških posljedica.

Ključne riječi: infekcija virusom Zapadnog Nila; meningoencefalitis; istočna Slavonija; Hrvatska.

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