

Difficulties in diagnosis of solitary and sporadic epileptic seizures

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Abstract

OBJECTIVE: Authors warn of difficulties in diagnostic of solitary epileptic seizure and epilepsy.

MATERIAL AND METHODS: Our groups have been made up of patients, who have been dismissed from our clinic in the period from January 1997 to January 2007 with diagnosis of solitary unprovoked epileptic seizure (n=84) and epilepsy with sporadic epileptic seizure (n=179). We have evaluated the clinical typology of epileptic seizure, EEG findings and results of imaging methods and we determined the part of patients with complete diagnostic concordance between clinical image of epileptic seizure and results of auxiliary diagnostic methods.

RESULTS: We have denoted the complete diagnostic concordance among the clinical image, EEG findings and results of imaging methods only in 13.1% of patients after solitary unprovoked epileptic seizure and in 24.02% of patients with diagnosis of epilepsy with sporadic epileptic seizures. The receiving diagnosis of unclear seizure status was determined at 49.14% of patients dismissed with diagnosis of solitary epileptic seizure and at 40.78% of patients dismissed with diagnosis of epilepsy with sporadic epileptic seizures in 10 year time period.

CONCLUSION: Our results repeat the confirmation that the diagnostic of seizure disorders, with and without disturbance of consciousness, belong to the difficult part in the clinical praxis.

INTRODUCTION

We noticed, by the EEG finding evaluation in our group of outpatients with epilepsy, that only in a small amount of cases the EEG findings corresponded completely with the clinical image of epileptic seizure. In the partial epileptic seizure it was 35 out of 150 patients (23.33%), in patients with clinically present generalized epileptic paroxysm it was 24 out of 150 patients (16%) (see Table 1).

In relation to the imaging methods and their diagnostic agreement with clinical symptomatology of epileptic seizure and EEG findings, it is

interesting that in the study of King *et al.* (1998), who evaluated the imaging of MRI abnormalities after the first epileptic seizure in 300 members of a group, consisting of both children and adults, they determined that, with patients having clinically diagnosed partial seizure, an epileptogenic lesion on the MRI was identified in 17% of cases. In 50 patients with clinical diagnosis of generalized seizure a structural lesion was identified in only one case and in the case of 49 patients with generalized epileptiform activity on EEG no structural lesion

on MRI was identified. These facts convey to us the need to try and establish in our own group of patients what number of solitary, unprovoked seizure with sporadic epileptic seizures, coincides with the clinical image of epileptic seizure with EEG findings and results of imaging methods. To illustrate the difficulties of diagnostics in this area we established the percentage of unclear receiving diagnosis in the group of patients dismissed from our clinic with diagnosis of solitary epileptic seizure and the epilepsy with the sporadic epileptic seizures.

MATERIAL AND METHODS

After evaluation of the EEG findings and results of imaging methods, we determined, in our group of patients who had been dismissed in the period from January 1, 1997 till January 1, 2007 with diagnosis of solitary epileptic seizure (n=84) and the epilepsy with sporadic epileptic seizures (n=179), the quota of patients with absolute diagnostic concordance from among the clinical image of epileptic seizure, the EEG findings and MRI, or CT imaging of the brain. We classified the epileptic seizures due to The international classification of epileptic seizures (ICES), which was first time published by The International League Against Epilepsy (ILAE) in the year 1970 and revised in the year 1981. The closer evaluation of the EEG findings and the imaging methods findings see Tables 2–4 (Kollar *et al.* 2009). We defined the patients with the sporadic epileptic seizures as those who had overcome a maximum of 5 epileptic seizures at least once during a year of the time period. For clearly diagnostic coincidence we considered, from generalized epileptic seizure (epileptic seizures), the appearance of generalized epileptiform activity on native interictal EEG, EEG after SD or LTM – EEG after SD and absence of focal lesion on CT or MRI of the brain. Of those patients with partial epileptic seizures we considered the appearance of regional epileptiform abnormality on native EEG, EEG after SD or LTM – EEG after SD with corresponding focus on CT or MRI of the brain.

Also, on the basis of retrospective analysis of the medical documentation, we determined the portion of unclear receiving diagnosis of the patients after solitary epileptic seizure – unprovoked as well as acute symptomatic (n=116) and with sporadic epileptic seizures (n=179).

RESULTS

The summary of all watched data in the group of patients after solitary epileptic seizure and after repeated sporadic seizures – see Table 5. The evaluation of clinical typology of epileptic seizures and results or realized examination – see Table 6.

The full diagnostic coincidence between the clinical picture of epileptic seizure, EEG examination (native

interictal EEG, or EEG after SD or LTM-EEG after SD) and results of imaging methods (CT or MRI of the brain) we found in 11 from 84 patients (13.1%) after solitary epileptic seizure and in 43 from 179 patients (24.02%) with the diagnosis of epilepsy with sporadic epileptic seizures. The receiving diagnosis of unclear

Tab. 1. Interictal EEG findings in our group of outpatients with partial epileptic seizures and generalized epileptic seizures.

	Normal	NFA	NGA	EFA	EGA
Partial epileptic seizures (n=150)	39 (26%)	30 (20%)	29 (19.33%)	35 (23.33%)	17 (11.33%)
Generalized epileptic seizures (n=150)	50 (33.33%)	18 (12%)	38 (25.33%)	20 (13.34%)	24 (16%)

(n = number of patient, NFA = non-epileptiform focal EEG abnormality, NGA = non-epileptiform generalized EEG abnormality, EFA = epileptiform focal EEG abnormality, EGA = epileptiform generalized EEG abnormality).

Tab. 2. Interictal EEG findings, EEG findings after SD and LTM-EEG after SD at the patients after solitary unprovoked epileptic seizure.

	Normal	NFA	NGA	EFA	EGA
EEG (n=84)	41 (48.81%)	23 (27.38%)	8 (9.52%)	8 (9.52%)	4 (4.77%)
EEG after SD (n ₁ =59)	35 (59.33%)	9 (15.25%)	6 (10.17%)	6 (10.17%)	3 (5.08%)
LTM-EEG after SD (n ₂ =46)	35 (76.09%)	6 (13.04%)	2 (4.35%)	2 (4.35%)	1 (2.17%)

Tab. 3. The interictal EEG findings, EEG findings after SD and LTM-EEG after SD at the patients with sporadic epileptic seizure.

	Normal	NFA	NGA	EFA	EGA
EEG (n=179)	77 (43.02%)	38 (21.23%)	18 (10.05%)	36 (20.11%)	10 (5.59%)
EEG after SD (n ₁ =89)	35 (39.32%)	10 (11.24%)	7 (7.87%)	23 (25.84%)	14 (15.73%)
LTM-EEG after SD (n ₂ =65)	32 (49.23%)	3 (4.62%)	4 (6.15%)	11 (16.92%)	15 (23.08%)

(EEG = native EEG examination, EEG after SD = EEG examination after sleep deprivation with one-hour recording, LTM-EEG after SD = 24-hour eight-channel EEG examination after sleep deprivation, NFA = non-epileptiform focal EEG abnormality, NGA = non-epileptiform generalized EEG abnormality, EFA = epileptiform focal EEG abnormality, EGA = epileptiform generalized EEG abnormality, n = whole number of patients who underwent interictal EEG examination, n₁ = number of patients who underwent EEG after SD and n₂ = number of patients who underwent LTM-EEG after SD. The numbers of patients are not identical for in case of diagnosed epileptic disorder or epileptic focus the whole EEG diagnostic algorithm was not needed).

Tab. 4. CT and MRI brain imaging in the evaluated groups of patients.

	The unprovoked solitary epileptic seizures		The sporadic epileptic seizures	
	Number of patients	Number/whole (%)	Number of patients	Number/whole (%)
CT brain	21		42	
Norm	5	23.81%	12	28.57%
Pathology	16	76.19%	30	71.43%
MRI brain	6		34	
Norm	2	33.33%	19	55.88%
Pathology	4	66.67%	15	44.12%
The both CT and MRI	57		103	
CT norm, MRI norm	28	49.12%	43	41.75%
CT norm, MRI pathology	12	21.05%	27	26.21%
CTpathology/MRI pathology- closer specification of CT by MRI	17/12	29.83%	33/21	32.04%
CT pathology MRI norm	0	0%	0	0%

Tab. 5. The summary of all watched data in the group of patients after solitary unprovoked epileptic seizure (n=84) and after repeated sporadic epileptic seizures (n=179).

The group of patients	n	The clinical type of epileptic seizure (Ilae 1981)									EEG												CT			MRI								
		1			2			3	MT	EEG				EEG after SD				LTM-EEG after SD				N	P	O	N	P	O							
		A	B	C	A	B	C	D	E	N	N	E	E	N	N	E	E	N	N	E	E													
										N	F	N	F	N	F	N	F	N	F	N	F													
Solit. unprov. EPI	84	5	3	25	/	/	40	8	/	/	/	41	8	23	4	8	34	6	9	3	6	25	35	2	6	1	2	38	45	33	6	30	33	21
Sporadic EPI	179	2	7	38	/	/	93	10	1	/	28	77	18	38	10	36	35	7	10	14	23	90	32	4	3	15	11	114	82	63	34	62	75	42

(EEG = native EEG examination, EEG after SD = EEG examination after sleep deprivation with one- hour recording, LTM-EEG after SD = 24-hour eight-channel EEG examination after sleep deprivation, n = number of patients, NFA = non-epileptiform focal EEG abnormality, NGA = non-epileptiform generalized EEG abnormality, EFA = epileptiform focal EEG abnormality, EGA = epileptiform generalized EEG abnormality, N - norm, P - pathology, 0 - wasn't realized. The clinical type of epileptic seizure /ILAE, 1981, being short/: 1 - The partial (focal) seizures: 1A - the simplex partial seizures, 1B - the complex partial seizures, 1C - the partial seizures with the secondary generalization, 2 - The generalized seizures without focal beginning (convulsive or nonconvulsive): 2A - the absence, 2B - the myoclonic seizures, 2C - the tonic-clonic seizures, 2D - the tonic seizures, 2E - atonic seizures, 3 - The unclassified epileptic seizures, MT = more types of epileptic seizures)

seizure status was determined in 57 out of 116 patients (49.14%) dismissed with the diagnosis of solitary epileptic seizure and in 73 out of 179 patients (40.78%) dismissed with the diagnosis of epilepsy with sporadic epileptic seizures.

DISCUSSION

Using the results obtained from a very small percentage of patients, how can we arrive at the ideal situation of a full diagnostic coincidence from among the clinical symptoms of epileptic seizures, EEG findings and the results of imaging methods? In the patients after a solitary unprovoked epileptic seizure it was only in 13.1% of cases and in the patients with sporadic epileptic seizures only in 24.02% of cases. These low percentages, together with a high part of unclear receiving diagnosis (the disturbance of consciousness of unclear etiology)

Tab. 6. The evaluation of clinical symptomatology of epileptic seizures with EEG, CT and MRI findings.

Coincidence	Solitary unprovoked EPI (n=84)	Sporadic EPI (n=179)
Clinical typology + EEG (EEG after SD, LTM-EEG afterSD)	16 (19.05%)	58 (32.40%)
Clinical typology + CT, MRI	52 (61.90%)	117 (65.34%)
Clinical typology + EEG + CT, MRI	11 (13.10%)	43 (24.02%)

in the patients, who were dismissed from our clinic with diagnosis of solitary epileptic seizure and sporadic epileptic seizures, suggests that the diagnosis of this group of patients is often problematic. From unclear

seizure status, which is accepted on the neurological departments, the more considerable part is made by unepileptic seizure status (Angus-Leppan 2008; Perrig & Jallon 2008). The next problem, which complicates the diagnosis in this area is often appearance of abnormal interictal EEG finding in “unepileptic diagnosis” (Kuba *et al.* 2001). The correct diagnosis of seizure disorders require the strict observance of standard diagnostic proceeding (Hovorka *et al.* 2004a,b; Martiniskova *et al.* 2009). The necessity are detailed anamnesis, adequate “erudition” of medical doctors working in this part of medicine, the right interpretation of auxiliary diagnostic methods results and in many cases the quality of cooperation between the doctors from other specializations (Hovorka *et al.* 2007).

CONCLUSION

Our results repeat the confirmation that diagnostic of seizure disorders with or without the disturbance of consciousness belong between the more difficult performances in the clinical praxis.

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