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A new review of seizure types in psychogenic non-epileptic status

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ABSTRACT

While the incidence of non-epileptic psychogenic seizures (PS) is 1.5-3/100000 in community, the prevalence of PS varies between 2-33/100000. The ratio of PS was reported 5-20% for epileptic patients in community and it was reported 10-40% in epileptic centers. Approximately 20% of patients, who applied to epilepsy centers because of drug resistance seizures, were diagnosed and reported as a PS. In 2005, 2009 and, as the last time, 2010, International League Against Epilepsy (ILAE) divided the status seizure types into two main groups as generalized onset and focal onset. It was categorized by subgroups as generalize convulsive status (tonic-clonic, tonic, clonic and myoclonic), generalize non-convulsive (absence) status, partial status and complex partial status by considering both EEG and clinical observations. In this study, we wanted to discuss the psychogenic non-epileptic status (PNE-status) types in our cases which are not elaborated in literature.

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1. Introduction

Non-epileptic psychogenic seizures (PS) appear similar to epileptic seizures. However, ictal or postictal electroencephalography (EEG) differences do not accompany PS, and this type of seizure is related to emotional periods (Bora et al., 2011).

While the incidence rate of PS is 1.5-3/100000 in the community, the prevalence of PS varies from 2-33/100000. The ratio of PS was reported as 5-20% for epileptic patients in the community and 10-40% in epilepsy centers. Approximately 20% of the patients who applied to epilepsy centers due to drug resistance seizures were diagnosed and reported as having PS (Benbadis and Hauser 2000; Szaflarski et al., 2000; Bora et al., 2011).

Psychogenic non-epileptic status (PNE-status) is characterized as continuously or frequently recurrent epileptic activation and long-lasting behaviors that have no relationship to ictal or postictal EEG changes. A common view of PNE-status duration does not exist. Some studies found that PS continued for at least 20 minutes, and other studies found a duration of 30 minutes. Dworetzky et al. (2010) conducted a survey of adult and pediatric epileptologists in 19 epilepsy centers. In this survey, the epileptologists agreed on at least 20 minutes of prolonged PS duration but emphasized that some seizures lasting between 10-20 minutes should be considered PS. Overall, 27-78% of PS patients also experience PNE-status (Dworetzky et al., 2010).

Status Epilepticus (SE) is characterized as more than 30 minutes of seizure duration or a recurrence of seizures in 30 minutes while unconsciousness occurs (Bradley et al., 1996). SE has recently been characterized as more than five minutes of generalized and convulsive seizures or as abnormal mind activity in patients after two or more exacerbations (Lowenstein et al., 1999). The incidence of SE varies between 60000 and 160000 in the USA (Hesdorffr et al., 1998).

Several classifications for SE classification exist in the literature. SE was first classified in 1980 at the Santa Monica International SE symposium as follows (Wasterlain, 1997):

1) Primary generalized convulsive status (tonic-clonic, myoclonic, clonic-tonic-clonic),

2) Secondary generalized convulsive status (partial onset tonic-clonic, tonic),

3) Basic partial status (partial motor, partial sensorial, affective, autonomus, partial with vegetative symptom)

4) Non-convulsive status (Absence, complex partial)

In 2005, 2009 and 2010, the International Committee of Epilepsy (ILAE) divided the status seizure types into two main groups, separating them by generalized or focal onset. These groups were further categorized into subgroups as generalized convulsive status (tonic-clonic, tonic, clonic and myoclonic), generalized non-convulsive (absence) status, partial status and complex partial status based on EEG and clinical observations (Berg et al., 2010).

In this study, we will discuss the psychogenic non-epileptic status (PNE-status) types observed in our cases that have not been elaborated in the literature.

2. Materials and Methods

In this study, 1548 seizures in 840 patients who were hospitalized for epilepsy surgery assessment were analyzed retrospectively by Video-EEG imaging in the Neurology Department clinics at Medical Faculty of Uludağ University, between 2001 and 2012. The patients who participated in this study were placed in the video-EEG unit, and their seizures and EEG were monitored. Cranial magnetic resonance imaging (MRI), neuropsychometric test (NPT) and psychiatric consultations were performed in the other unit, and the patients were diagnosed as having PNE-status.

3. Results

In total, 20% of the seizures (305/1548) were observed in 10.8% of the patients (91/840) with PS. Of these 91 patients, nine had PNE-status, and 39 PNE-status seizures were completely observed. The SE ratio was 10.5% (88/840).

In total, nine patients (9/840) were followed up for PNE-status. Of those patients, five were women, and the other four were men. The mean age at seizure onset was 21.7 (8-35). All PNE-status patients were used antiepileptic drugs, and the mean antiepileptic drug number was 2.2 (1-4). The mean seizure frequency was 6.1(1-15) per month. Complex partial seizures (CPS)-like status seizure was observed in two patients (Video-1), generalized tonic-clonic (GTC)-like status seizure was observed in three patients (Video-2), secondary generalized status-like seizure was observed in one patient (Video-3) and focal motor status-like seizure was observed in two patients (Video-4) who were monitored in the Video-EEG monitoring (VEM). Of the nine patients, six had a prior hospitalization history for SE. One of the nine patients was operated previously for a left parietal mass and had an abnormal cranial MRI as a complication of the operation. Patients were monitored with the video-EEG unit for four days on average (2-6 days). Demographic and seizure information about the SE and PNE-status of the patients is presented in Table 1.

Eight patients with PNE-status had seizures for 30 minutes, and one patient with PNE-status had seizures for 45 minutes. Pathology was detected in the interictal EEG of three of nine patients. Three of the nine patients had prior epileptic seizures. Neuropsychometric tests of the patients with PNE-status were generally concluded as frontal disorder or normal test results with some inattentiveness. The prolactin levels were measured three times in the postictal period and were normal. Psychiatric examination of the patients showed that two patients had conversion disorder; one patient had somatization disorder; one patient had dysthymia; one patient had major depression; one patient had borderline personality disorder; one patient had dependent personality and major depression; one patient had immature personality disorder and anxiety disorder; and one patient had conversion disorder and major depression.

In total, 88 patients (88/840) were followed up for SE. Of those patients, 51 were women, and 37 were men. The mean age at seizure onset was 6.6 (2-71) years. Of these 88 patients, 71 had previously used antiepileptic drugs, and the mean antiepileptic drug number was 3.7 (2-6). The mean seizure frequency was 4.8 (3-15) per month generalized tonic-clonic (GTC) and secondary.

GTC status-like seizure was observed in 43 patients, and focal motor status-like seizure was observed in 13 patients monitored in the VEM. Of the 88 patients, 28 had a history of prior hospitalization for SE. Of the 88 patients, 56 had an abnormal cranial MRI (e.g., focal critical dysplasia, mesial temporal sclerosis, tumor, schizencephaly, hemimegalencephaly) (Table 2).

Table 1. Demographic and seizure information about SE and PNE-status patients

	PNE-STATUS (n=9)	SE (n=88)
The mean age	30.7(18-59)	42.1 (18-71)
Gender (M/F)	5/4	51/37
The age at onset of epilepsy	21.7(8-35) age	16.6 (2-43) age
The used of AEDs/number/average	9/2.2	(71/88)/3.7
Seizure frequently/mounth/time/average	6.1	4.8
The VEM observed seizure type	CPS-like status=2	Primary GTC=43
	Primary GTC like=3	Secondary GTC=32
	Secondary jen. Status-like=1	Focal motor status=13
	Focal motor status=2	
SE with a history of hospitalization	6/9	28/88
Abnormal cranial MR	1/9	56/88
Compatable with the SE ictal EEG	No	88/88

GTC: Generalized tonic-clonic; **CPS:** Complex partial seizures; **AED:** Antiepileptic drug; **SE:** Status Epilepticus; **VEM:** Video-EEG monitoring

Table 2. Demographic, seizure characteristics and laboratory findings of psychogenic non-epileptic status-status patients.

	Case-1	Case-2	Case-3	Case-4	Case-5	Case-6	Case-7	Case-8	Case-9
Gender/age	M/20	M/24	F/26	M/35	M/32	F/35	F/18	F/28	F/59
Occupation/ Marital status	Worker/single	Worker/married	House wives/ single	Unemployed/ married	Worker/ married	Housewife/ married	Housewife/ single	Secretary/ single	Housewife/ married
The age at onset of epilepsy	14 age	23 age	8 age	34 age	15 age	25 age	19 age	20 age	38 age
Seizure frequency/ month/time	1-2/m/10-15 minute	15/m/45minute	1.seizure: 1-2/ m/20 minute 2.seizure: 3-4/ m/2 minute	8-10/m/ 30minute	1.seizure: 3-4/m/2 minute 2. seizure1/m/ 30 minute	10/m/30 minute	15/m/ 15minute	1-2/m/ 10-15 minute	10/m/ 30minute
Seizure type described	The left arm focal motor	Frontal and GTC	CPS, secondary generalized	Starting from left to secondary generalized	GTC	Focal motor in both arms	Right focal status	The left arm focal motor	Frontal and GTC
SE with a history of hospitalization	2 times Phenytoin, diazepam, intubated	1 times Intubated	3 times Diazepam, phenytoin, Valproate infusion	1 times Diazepam, phenytoin	2 times Intubated	No	No	1 times Diazepam, phenytoin	No
The use of AEDs	CBZ, VPA, LEV	LEV, PHT	CBZ, LEV	PHT, CBZ, TPM	VPA, CBZ, TPM	CBZ, FB	LEV, CBZ, TPM	CBZ, VPA	PHT, VPA
Interictal EEG	Normal	Normal	Left frontotemporal SA	Normal	Generalized SA	SWA left parietal	Normal	Normal	Normal
Ictal EEG	Normal	Normal	Normal and left frontotemporal SWA	Normal	Normal and left frontal SWA	Normal	Normal	Normal	Normal
VEM number of seizures	6 times PNE-Status	4 times PNE-Status	3 times PNE-status, 2 times CPS	6 times PNE-Status	5 times PNE-Status, 3 times seconder generalzie	15 PNES times	4 PNE-Status	3 PNE-Status	3 PNE-Status
VEM type of seizures	CPS like status	Frontal and seconder GTC like	CPS like status	GTC like	GTC	Focal motor like Status	Focal motor like status	Focal motor like Status	GTC like
Cranial MRI	Syringomyelia	Normal	Normal	Normal	Mild cortical atrophy	Encephalomalacia in the left parietal	Normal	Normal	Normal
NPT	Attention deficit	Normal	Frontal challenges	Attention deficit	Limited mental capacity MMSE:22/30	Attention deficit	Normal	Attention deficit	Attention deficit
Psychiatric examination	Somatic disorder	Borderline Personality Disorder	Dependent personality, major depression	Conversion disorder	Immature, people, anxiety disorder	Conversion disorder and major depression	Conversion disorder	Dysthymia	Major depression
Other history	Uncle epileptic	Aunt reluctant marriage with his daughter	Febrile Convulsion (+) Mixed Seizure	Unemployed and his wife had abandoned	The patient has an epileptic brother	Operated for the left parietal glial tumor	His father was separated from home	No	No
PRL levels	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal

GTC: Generalized tonic-clonic; **CPS:** Complex partial seizures; **AED:** Antiepileptic drug; **SE:** Status Epilepticus; **MMSE:** Mini mental state examination; **PRL:**Prolactin; **NPT:** Neuropsychometric tested; **SWA:** Slow wave activity; **SA:** Spike activity; **CBZ:** Carbamazepine; **VPA:** Valproic acid; **LEV:** Levetiracetam; **PHT:** Phenytoin; **TPM:** Topiramate; **FB:** Phenobarbital, **M:** Male; **F:** Female; **PNE:** Psychogenic non-epileptic status; **VEM:** Video-EEG monitoring.

4. Discussion

PNE-status, also termed psychogenic status, pseudo status, psychogenic status epilepticus and prolonged psychogenic status, has no relationship to ictal or postictal EEG changes. PNE-status is characterized by continuous or frequently recurrent psychogenic originating episodes that last more than 30 minutes. It is important that the episodes of PNE-status look similar to seizure-related SE (Reuber et al., 2003).

SE occurs if any type of epileptic seizures is of long enough duration or if seizures occur so frequently that the neurologic condition does not improve between two seizures. It is reported that 1.3-1.6% of chronic epileptic patients can have SE. Mortality depends on various factors, including age and duration, and is between the ratio of 8-32% at status epilepticus (Sepkuty, 2006). GTC, secondary GTC and focal motor status, which we diagnosed as SE, were observed in 43, 32 and 13 patients, respectively.

Reuber et al. (2000) published five postoperative pseudostatus cases in 2000. They observed patients who had suicide attempts, psychiatric history and tonic-clonic-like contractions after minor operations. The authors indicated that the patients did not respond to stimulus while their eyes were open. The patients were intubated, and intravenous antiepileptic drugs and anesthesia were given to the patients. The postictal prolactin and the EEG recorded during the episode were observed as normal. The postictal prolactin levels of our nine PNE-status patients were normal, in accordance with the literature (Reuber et al., 2003).

In the literature, there is a case about the 3rd trimester of pregnancy, in which the patient did not respond to the first step treatment. The patient was intubated with thiopental after using diazepam and phenytoin for recurrent generalized seizures during treatment in the epilepsy center. This was not a case of eclampsia of pregnancy. All tests, including cranial imaging and lumbar puncture, were normal, and pseudostatus was diagnosed after a five day observation (Peters et al., 2007). In our cases, three patients had GTC-like seizures, and one patient had secondary generalized status-like seizures. It attracted our attention that these patients were diagnosed with status epilepticus, and the intravenous antiepileptic treatment protocol was applied by our clinicians.

Venous catheter placement had to be performed 24 times for a 20-year-old patient in Sri Lanka due to resistant seizures. Non-generalized tonic-clonic contractions were observed at the time of the patient's hospitalization; these contractions continued for seven hours and could not be controlled with diazepam. The patient took organophosphates for the purpose of suicide (Gunatilake et al., 1997). In our cases, nine patients applied several times to the emergency clinic, six of whom were intubated for SE. Many tests were performed, and these patients were hospitalized 20 days in total, including their emergency clinic stays. This finding indicates that the incorrect diagnosis may cause the unnecessary hospitalization of patients.

There is a report of a pediatric PNE-status in the literature. A nine -year-old patient with epilepsy and mental retardation had decreasing contractions in some seizures that differed from his other seizures, and he had a pedaling sign at his legs. His seizures lasted for long periods, and he did not respond to diazepam, phenytoin or phenobarbital. The case was acknowledged as PNE-status and was psychiatrically treated as conversion disorder (Tuxhorn and Fishbach, 2002). In our cases, we had no pediatric patients, but three of the nine cases had epileptic seizures in addition to PNE-status. It is reported that 1.3-1.6% of patients with chronic epilepsy can have PNE-status at any time during the disease process. SE can develop in epileptic patients. For patients with psychiatric disorders, it should be remembered that PNE-status and psychogenic epileptic seizures can develop on a psychiatric basis.

Cases reflecting the psychiatric symptoms of PNE-status, such as a suicide attempt by organophosphate ingestion, were present in the literature. Additionally, psychotherapy was used in a case of a mentally retarded pediatric patient, in whom significant improvement was observed. In our cases, two patients had conversion disorder; one patient had somatization disorder; one patient had dysthymia; one patient had major depression; one patient had borderline personality disorder; one patient had depended personality and major depression; one patient had immature personality and anxiety disorder; and one patient had conversion disorder and major depression. Although the published series contain few PNE-status cases, these series provide researchers with very important information. These series contain assessment information about the cases and the applied treatment methods. They also attract our attention to the psychiatric predisposition for PNE-status (Gunatilake et al., 1997).

The acute and dramatic process of PNE-status patients (although some are epileptic) can lead us to the SE diagnosis. If these patients do not respond to conventional SE treatment and have a prior hospitalization history with previously diagnosed SE, we should consider a PNE-status diagnosis for these patients.

According to our findings, the incidence rate of PNE-status cases has recently increased because of physicians, especially emergency clinicians, who are inexperienced with epilepsy and seizure semiology, a lack of centers where video-EEG imaging is available, and numerous wrong assessments of EEG by inexperienced clinicians.

Video-1: The seizure began with the right deviation of the eyes. The patient was looking with empty eyes, and the patient's face was fearful. The patient did not answer questions. The patient began to gulp and take deep breaths. A dystonic posture that looked like a tonic contraction was observed in the left wrist. Some movements that looked like automatisms were observed when the patient moved his right arm to a flexion posture. The patient's seizure continued for approximately 30 minutes. In that time, he moved his neck to a flexion posture and began to breathe wheezily. It was observed that patient had cyanosis.

Video-2: The patient began to contract his teeth and move his legs continuously. The patient had a tonic-clonic seizure during 30 minutes in the left lateral lying posture. The patient's eyes were closed, and the patient did not talk during seizure. The patient did not answer questions during the seizure and did not remember keywords that were given to him after the seizure. The light reflex could not be taken in the neurologic examination. There were no pathologic reflexes.

Video-3: The patient began to breathe deeply. The patient's eyes deviated to the right. Contractions were observed in his legs and arms. The patient's face was fearful. His head and

eyes deviated to right. He did not understand spoken words and did not answer questions. The patient moved his neck to a flexion posture. The patient began to foam at the mouth, and stronger contractions were observed. The patient seized for approximately 35 minutes.

Video-4: The seizure began with a gulp movement. The patient's eyes were open slightly. The patient had rhythmic high amplitude contractions in the right arm and began to swing his arm in the air. The patient's seizure continued for 45 minutes in this way. The patient also moved his left arm similarly.

REFERENCES

Berg, A.T., Berkovic, S.F., Brodie, M.J., Buchhalter, J., Cross, J.H., Van Emde Boas, W. 2010. Revised terminology and concepts for organization of seizures and epilepsies: Report of the ILAE Commission on Classification and Terminology, 2005-2009. Epilepsia. 51, 676-685. doi: 10.1111/j.1528-1167.2010.02522.x.

Benbadis, S.R., Hauser, A.W. 2000. An estimate of the prevalence of psychogenic nonepileptic seizures. Seizure. 9, 280-281. http://dx.doi.org/10.1053/seiz.2000.0409.

Bora, I.H., Taskapilioglu, O., Seferoglu, M., Kotan, O.V., Bican, A., Ozkaya, G., Akkaya, C. 2011. Sociodemographics, clinical features, and psychiatric comorbidities of patients with psychogenic nonepileptic seizures: Experience at a specialized epilepsy center in Turkey. Seizure. 20, 458-461. doi: 10.1016/j.seizure.2011.02.007.

Bradley, W.G., Daroff, R.B., Fenichel, G.M., Marsden, C.D. 1996. Neurology in clinical practice, in Bradley WG (ed): The epilepsies. Second edition, USA, 1625-1654.

Dworetzky, B.A., Bubrick, E.J., Szaflarski, J.P. 2010. Nonepileptic psychogenic status markedly prolonged psychogenic nonepileptic seizures. Epilepsy Behav.19, 65-68. http://dx.doi.org/10.1016/j.yebeh.2010.06.052.

Gunatilake, S.B., De Silva, H.J., Ranasinghe, G. 1997. Twenty-seven venous cutdowns to treat pseudostatus epilepticus. Seizure. 6, 71-72. http://dx.doi.org/10.1016/S1059-1311(97)80057-X.

Hesdorffr, D.C., Logroscino, G., Cascino, G. 1998. Incidence of status epilepticus in Rochester, Minnesota, 1965-1984. Neurology. 50, 735-741.

Lowenstein, D.H., Bleck, T., Macdonald, R.L. 1999. It's time to revise the definition of status epilepticus. Epilepsia. 40, 120-122.

Peters, G., Leach, J.P., Larner, A.J. 2007. Pseudostatus epilepticus in pregnancy. Int. J. Gynaecol Obstet. 97, 47. http://dx.doi.org/10.1016/j.ijgo.2006.12.008.

Reuber, M., Enright, S. M. Goulding, P. J. 2000. Postoperative pseudostatus not everything that shakes is epilepsy. A case report. Anaesthesia. 55, 70-78.

Reuber, M., Pukrop, R., Mitchell, A.J., Bauer, J., Elger, C. E. 2003. Clinical significance of recurrent psychogenic nonepileptic seizure status. J Neurol. 250, 1355-1362.

Sepkuty, J.2006. Status epilepticus In: Johnson, R.T, Griffin, J.W., McArthur, J.C, editors. Current Therapy in Neurologic Disease. 7 ed. Philadelphia: Elsevier. p. 45-48.

Szaflarski, J.P., Ficker, D.M., Cahill, W.T., Privitera, M.D. 2000. Four-year incidence of psychogenic non-epileptic seizures in adults in Hamilton County, OH. Neurology. 55, 1561-1563.

Tuxhorn, I., E., Fischbach, H.S. 2002. Pseudostatus epilepticus in childhood. Pediatr Neurol. 27, 407-409.

Wasterlain, C., G.1997. Definition and classification of status epilepticus. The International Meeting on Status Epilepticus, Santa Monica, CA.