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Challenges in the Diagnosis of Patients Presenting with the "First Seizure"

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Abstract

Objective: Epileptic seizures are paroxysmal events resulting from abnormal neuronal activity. Diagnosing a first seizure presents a significant clinical challenge, particularly in patients without a previous similar history. This study aims to evaluate the clinical approach to first seizures, which are often posing diagnostic and therapeutic challenges.

Methods: This prospective study was conducted in a tertiary care hospital and included patients admitted to the emergency department and neurology outpatient clinic with suspected first seizures from January 2023 to March 2024. Patients were followed for at least one year. Data collected included age, gender, laboratory tests, cranial imaging, and electroencephalogram (EEG) results. Final diagnoses were classified as either "seizure" or "seizure mimics," with seizures further categorized into "unprovoked" and "acute symptomatic." The unprovoked category was divided into "true first seizure" and "recurrent seizure."

Results: A total of 210 patients were included in the study, with 152 diagnosed with seizures and 58 with seizure mimics. The mean age was 43.7 years. The male/female ratio was 55.3%/44.7%. In the "seizure" group, 119 patients (56.7%) had unprovoked and 33 (15.8%) had acute symptomatic seizures. In the unprovoked group, 106 patients (50.5%) were classified as having a true first seizure. Detailed history revealed that 13 patients (6.2%) had at least one similar seizure before. Seizure recurrence was observed in 27 patients (25.5%).

Conclusion: This study highlights the diagnostic challenges of first seizures. Accurate differentiation between epileptic seizures and mimics is crucial. Comprehensive history and EEG are essential for optimizing treatment, and initiating therapy in true seizure cases effectively reduces the risk of recurrence.

Keywords: First, seizure, recurrent, epileptic, treatment

INTRODUCTION

Epileptic seizures are paroxysmal and episodic phenomena characterised by behavioural, somatosensory, motor, or visual signs and symptoms due to abnormal, excessive, or synchronized neuronal activity in the brain. The clinical situation in which patients present with seizure without a previous history of seizure is considered the first seizure.[1-3]

The evaluation of a suspected first seizure presents several diagnostic challenges, including determining the underlying etiology, assessing the risk of recurrence, determining the need for diagnostic electroencephalogram (EEG) or neuroimaging, determining whether to initiate anti-seizure medication (ASM), and managing patient and family concerns about social or emotional impact on lifestyle.[4]

A key concern is whether the event represents a true seizure associated with epileptogenic brain pathology or a "seizure mimic." This distinction is crucial, as it directly affects both seizure recurrence prognosis and the choice of treatment strategies.[3,5] A wide spectrum of differential diagnoses must be considered when evaluating a **first seizure**. These include psychogenic non-epileptic seizures (PNES), syncope, transient ischemic attacks (TIAs), migraine auras, paroxysmal movement disorders, transient global amnesia, sleep disorders, and panic attacks.[1,2]

Another critical aspect is differentiating between an **acute symptomatic seizure** and an **unprovoked seizure**, as their treatment and prognosis differ significantly. It is essential to distinguish between these conditions as early as possible. In addition to obtaining a detailed

patient history and performing a thorough physical examination, healthcare providers use other diagnostic tools—such as laboratory tests, EEG, and neuroimaging—that play a crucial role. In cases of unprovoked seizures, evaluating the risk of recurrence and determining whether to initiate treatment is of utmost importance.

In this context, a structured approach should be implemented when assessing patients presenting with a suspected first seizure. This approach should include a thorough differential diagnosis, appropriate investigations, timely initiation of treatment when necessary, and continued follow-up with neurology specialists. In our study, we assessed patients admitted to our hospital with a suspicion of first seizure. The primary objective was to identify key clinical features critical for diagnosing an initial epileptic seizure, to determine criteria for initiating ASM, and to evaluate the effect of regular medication use on seizure recurrence.

METHODS

The study was conducted in a tertiary care hospital. Patients who were prospectively admitted to the emergency department and neurology outpatient clinic with a suspected first seizure between January 2023 and March 2024 were included in the study. They were followed up for at least a year in the outpatient clinic. Patients who failed to attend follow-up visits were excluded from the study.

Clinical history was obtained through interviews with the patient, when possible, corroborated by family members or witnesses when available. Patient data, including age, gender, cranial imaging findings, and EEG results, were evaluated. Routine laboratory tests performed in the emergency department included complete blood count, glucose, urea, creatinine, liver enzymes, and electrolytes. Additionally, more detailed tests, such as vitamin B12 and thyroid function tests, were included if performed during follow-up. Cranial magnetic resonance imaging (MRI) and EEG results obtained either in the emergency department or during follow-up were analyzed.

EEG recordings were conducted while patients were awake for 30 minutes, and in some cases, prolonged recordings lasting up to two hours were performed including both sleep and wake periods. The routine EEG recordings were typically 20-30 minutes in duration, while extended recordings (up to two hours) were performed when clinically indicated when routine EEG was normal and the clinical diagnosis of epilepsy was strong, or in cases where sleep EEG was more informative, such as idiopathic generalized epilepsies. Scalp electrodes were placed according to the 10-20 international system. The time constant was set at 0.3 seconds, and the high-frequency filter was standardized at 70 Hz. Intermittent photic stimulation with flash frequencies ranging from 1 to 60 Hz was applied in all cases, followed by four minutes of hyperventilation. Eye-opening and eye-closure responses were noted in all recordings. EEG findings were classified as follows: normal, epileptiform discharges (focal, multifocal, generalized), and slowing (focal, generalized). EEG recordings were performed within the first 24 hours for patients who presented to the emergency department (84%), but for those who presented to the outpatient clinic, EEG recordings were performed later (within at most one month). All EEGs were interpreted by two neurologists with expertise in clinical neurophysiology.

MAIN POINTS

- Differentiation between seizure and seizure mimicker during the "first seizure" presentation is critical for accurate diagnosis.
- Detailed anamnesis, additional investigations such as electroencephalogram/magnetic resonance imaging and a multidisciplinary approach are necessary to optimise the treatment process.
- The risk of recurrent seizures is higher in patients with status epilepticus.
- Early initiation of treatment was effective in reducing the risk of seizure recurrence.

The final diagnoses of the patients were determined as either "seizure" or "seizure mimics." Seizures are further divided into "unprovoked seizures" and "acute symptomatic seizures." Unprovoked seizures are further divided into "true first seizure" and "recurrent seizure." The recurrent seizure group included patients who were admitted to the hospital for their first seizure but actually had a previous history based on a detailed medical history. The diagnosis of epilepsy was made based on the International League Against Epilepsy (ILAE) criteria.[6] The seizure semiology was evaluated according to the 2017 classification of the ILAE. In patients diagnosed with epilepsy, data on whether ASM was initiated and whether seizures recurred during follow-up were collected.

The study was approved by the Local Ethics Committee of the University of Health Sciences Türkiye, Sancaktepe Şehit Prof. Dr. İlhan Varank Training and Research Hospital (approval no: 2023/04, date: 16.01.2023). Informed consent was obtained from all patients.

Statistical Analysis

Statistical analysis was performed using SPSS version 26 (IBM Corp., Armonk, NY, USA). To compare categorical values, we used chi-square test. To compare quantitative data between two groups, we used t-test and Mann-Whitney U tests. A p-value of <0.05 was considered statistically significant.

RESULTS

A total of 210 patients were admitted to our hospital with a suspected "first seizure." The mean age of the patients was 43.7±19.5 years (18-86). The female to male ratio was 94/116 (44.7%/55.3%).

Final Diagnoses of Patients with Admission "First Seizure"

Among the patients who presented with suspected first seizure, 152 were diagnosed with a seizure, while 58 were diagnosed as seizure mimics.

Within the seizure group, there were 119 patients with unprovoked seizures and 33 patients with acute symptomatic seizures. Upon further questioning of the patients' history, it was found that 13 of 119 patients who presented with a first epileptic seizure had experienced at least one similar attack previously. These patients were classified as having recurrent seizures. After excluding patients with recurrent seizures, 106 (50.5%) patients were classified as having a true first seizure (Figure 1). The etiologies of these seizures are summarized in Table 1. Thus, a diagnosis of first epileptic seizure was confirmed in a total of 139 patients. As a result of this evaluation, the seizure type could be identified in 76 patients (54.7%). Among these, 59 patients (42.4%) had

generalized tonic-clonic seizures (GTCS), 11 (7.9%) had focal motor seizures, 3 (2.2%) had focal non-motor seizures, and 3 (2.2%) had focal onset seizures evolving into GTCS. However, since seizure type was primarily determined based on the anamnesis obtained from patients or their relatives, the onset pattern of seizures may not have been clearly identified in some cases. Therefore it should be considered that a portion of seizures recorded as GTCS may, in fact, originate as focal onset seizures that evolve into GTCS.

In the remaining 63 patients (45.3%), seizure semiology could not be definitively classified due to insufficient clinical data and was therefore categorized as "unknown."

There were 33 patients with acute symptomatic seizures. The most common cause was metabolic derangement, with hyperglycaemia being the leading type. Other identified causes included hyponatraemia, hypoglycaemia, hypocalcaemia, metabolic acidosis and metabolic alkalosis. The etiologies are summarized in Table 2.

Table 1. The etiologies of unprovoked true FSs

The etiologies of unprovoked FSs	Patients with unprovoked FS (n=106) (n/%)
Unknown etiology	46/43.4
Symptomatic focal epilepsy	41/38.7
Poststroke	10/9.4
Gliotic lesions of unknown etiology	9/8.5
Posttraumatic	6/5.7
Tumor	5/4.8
Vascular malformation	4/3.8
Malformation of cortical development	2/1.9
Metastasis	2/1.9
Multiple sclerosis	1/0.9
Hipocampal sclerosis	1/0.9
Leukodystrophy	1/0.9
Idiopathic generalized epilepsy	10/9.4
Dementia	7/6.6
Neurodevelopmental retardation	2/1.9

FS: First seizure

Fifty-eight of the patients were identified as seizure mimics, with their final diagnosis being syncope in 37, PNES in 18, migraine in one, vertigo in one, and TIA in one (Figure 1).

Demographic and clinical characteristics of patients in true first seizure, acute symptomatic seizure and seizure mimics group is summarized in Table 3.

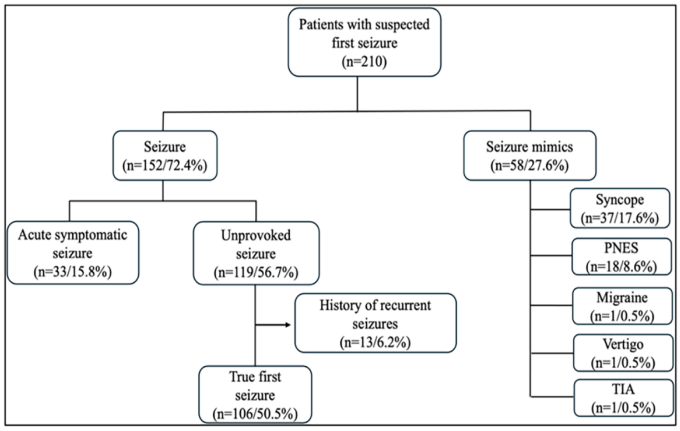

Figure 1. Final diagnoses of patients with admission "first seizure"

Table 2. The etiologies of acute symptomatic seizures

Etiologies of acute symptomatic seizures	Patients with acute symptomatic seizures (n=33) (n/%)
Metabolic derangements	14/42.4
Cerebrovascular disease	8/24.2
Acute ischemic stroke	3/9.1
Cerebral venous thrombosis	3/9.1
Intracranial haemorrhage	2/6
Drugs and alcohol and subtance abuse	8/24.2
Infection	2/6
Head trauma	1/3.1

Table 3. Demographic and clinical characteristics of the patients included in the true first seizure, e.g. acute symptomatic epileptic seizure group and seizure mimics group

	True first seizure (n=106) (n/%)	Acute symptomatic seizure (n=33) (n/%)	Seizure mimics (n=58) (n/%)
Age	44±20.2	55.3±19.4	38.7±15.8
Gender (F/M)*	40/66 (37.7/62.3)	16/17 (48.5/51.5)	32/26 (55.2/44.8)
Family history of epilepsy	13/12.3	1/3	3/5.2
Aura	7/6.6	None	None
Abnormal EEG	39/40.2%	6/25%	2/4.9%
Focal epileptic	9.3%	4.2%	-
Generalised epileptic	15.4%	4.2%	-
Focal slowing	7.3%	8.4%	4.9%
Generalised slowing	8.2%	8.4%	-
Nocturnal	19/18	None	None
Status epilepticus	5/4.8	None	None
Recurrence	27/25.5	None	5/8.7
Patients underwent treatment with ASM	87/82.1	10/30.4	1/1.8

*F: Female, M: Male, EEG: Electroencephalogram, ASM: Anti-seizure medication

EEG Findings

In the seizure mimics group, 41 patients (70.7%) underwent EEG for differential diagnosis. There were only two patients (4.9%) who had abnormal EEG findings in this group. One of these patients was diagnosed with syncope, and the EEG finding demonstrated frontal intermittent rhythmic delta activity. The other patient was diagnosed with PNES and the EEG findings demonstrated focal slowing in the left parietal area. EEGs of the remaining 39 patients were normal.

In the true first seizure group, 97 out of 106 patients (91.5%) underwent EEG for differential diagnosis. The EEG was not performed on 9 patients because they did not attend their scheduled EEG appointments. In this group, 39 (40.2%) patients had abnormal EEG; 24 (24.7%) demonstrated epileptiform abnormalities. Most of the patients with idiopathic generalized epilepsy (IGE) exhibited epileptic abnormalities on their EEGs. In the symptomatic focal epilepsy group, only 15.75% of EEGs showed epileptiform abnormalities.

In the acute symptomatic group, 24 patients (72.7%) underwent EEG for differential diagnosis. There were six patients (25%) with abnormal EEG in the acute symptomatic group (Table 3).

Nocturnal Seizures

A total of 24 patients had a history of nocturnal seizures. All patients with nocturnal seizures were evaluated as having unprovoked seizures. Five of them did not have true first seizures when questioned in detail, but had recurrent seizures.

All patients with nocturnal seizures were started on ASM. Seizure recurrence occurred in four of them. Among the patients with seizure recurrence, two had a history of self-discontinuation of medication.

Status Epilepticus

The first seizure episode was status epilepticus (SE) in five patients. The etiologies were atrophy/gliosis (n=3) and brain tumour (n=2). Drug treatment was initiated in all of them. Seizure recurrence was observed in 3 (60%) patients. One of the patients with seizure recurrence died in the intensive care unit.

Cranial Imaging Findings

Cranial imaging was performed on all patients using MRI for etiological investigation. In the seizure mimics group, MRI was performed on 47 out of 58 individuals. Eleven of them had abnormalities. The abnormalities included gliotic lesions, ventricular asymmetry, a lipoma, arachnoid cysts, and atrophy. MRI was not conducted for eleven patients in this group because it was not deemed clinically necessary.

In the true first seizure group, cranial imaging of 101 patients was performed with MRI for etiological investigation. The MRI features are summarized in Table 1.

Treatment

Acute symptomatic group: Drug treatment was started in 10 (30.4%) patients due to underlying etiologies that posed a high-risk for seizure recurrence. Levetiracetam was the drug of choice. Therefore, levetiracetam accounted for 100% of ASM usage in this group. Seven of them had cerebrovascular disease [ischemic; hemorrhagic; and cerebral venous thrombosis (CVT)]. One had an intracranial infection. The remaining two patients had metabolic disorders such as hyponatremia and hyperglycemia; since atrophy and white matter chronic ischemic gliotic changes were seen in their cranial MRIs, they were considered high-risk and were started on antiseizure medication. None of them had seizure recurrence during follow-up.

Drug treatment of one patient with acute stroke was discontinued after one year, and no seizure recurrence was observed during a drug-free one-year follow-up. All patients with haemorrhage, infection, and CVT continued their medication, and no seizure recurrence was observed during follow-up.

True first seizure: Eighty-seven (82.1%) patients were started on ASM. In this group, levetiracetam was the most commonly prescribed antiepileptic drug, administered to 73 patients (83.9%). Carbamazepine and lamotrigine were each prescribed to 4 patients (4.6%), and valproate to 6 patients (6.9%). All 18 patients who had their first seizure but were not started on medication were in the etiology undetermined group.

Table 4. Comparision of clinical features of recurrent and non-recurrent true first seizure patients

Unprovoked seizure group (n=106)	Recurrent (n=27) (n/%)	Non-recurrent (n=79) (n/%)	p-value
Presence of epileptic abnormality on EEG	11/40.8	31/39.3	0.89
Patient without ASM	3/11.1	16/20.3	0.23
Interruption in drug therapy	7/26	-	<0.001
Etiology			
Unknown etiology	13/48.2	33/41.8	0.56
Symptomatic focal epilepsy	9/33.4	32/40.5	0.51
IGE	5/18.5	5/6.4	0.53
MRI abnormality	10/37.1	57/72.1	0.001
Nocturnal	5/18.5	14/17.7	0.92
Family history	2/7.5	11/14	0.51
Status Epilepticus	3/11.1	2/2.5	0.69

MRI: Magnetic resonance imaging, ASM: Anti-seizure medication, EEG: Electroencephalogram, IGE: Idiopathic generalised epilepsy

Seizure mimics group: No medication was started. Only one patient was started on medication temporarily in the emergency department because of the difficulty distinguishing between seizure and seizure mimic semiologically at his first emergency visit while awaiting further diagnostic clarification. However, after a normal EEG and detailed clinical evaluation, the medication was stopped within the first week.

Seizure Recurrence

Acute symptomatic group: Seizure recurrence was not observed in the acute symptomatic seizure group.

Seizure mimics group: Four patients with PNES and one patient with syncope had recurrence of the attack.

True first seizure: Twenty-seven (25.5%) patients had seizure recurrence. When we look at the etiologies of the patients with recurrence, 13 of these patients had an unknown etiology (three of them were not on ASM; four patients had a history of medication failure, and one patient had a history of sleep deprivation and alcohol intake).

Five patients with recurrence of seizures have been diagnosed with IGE. Seizures were controlled with drug dose adjustment. The remaining 9 patients had symptomatic focal epilepsy. Three of them had issues with drug compliance.

The highest recurrence rate was in IGE (50%). The percentage was lower in the etiology undetermined group (28.3%) and symptomatic focal epilepsies (21.9%). The clinical and EEG features of the recurrent and non-recurrent groups are summarized in Table 4.

DISCUSSION

The primary aim of this study was to determine whether the seizures in patients presenting with a "first seizure" were true epileptic seizures or non-epileptic attacks and to analyze the etiology and prognosis of seizures in these patients.

In this study, approximately 52% (109/210) of the patients were correctly identified as experiencing a seizure (acute symptomatic or unprovoked). Detailed histories revealed that 13 patients in the unprovoked seizure group had a history of similar seizures. Consequently, approximately 6.2% of patients initially suspected of having a first seizure were reclassified as having recurrent seizures. Similar to our findings, in the study conducted by Jackson et al.[3] 83% of the patients presenting with suspicion of a first seizure were diagnosed with a first seizure, but 39% of these patients had a history of previous seizures. Although this rate was lower in our study, it still underscores the importance of considering the possibility that patients presenting with a first seizure may have had prior seizures. These findings emphasize the necessity of obtaining a detailed medical history for accurate diagnosis. This step is crucial not only for identifying possible previous seizures but also for ruling out non-epileptic seizures.[7]

Non-epileptic attacks or seizure mimics represent significant diagnostic challenges in clinical practice. In our study, approximately 27.6% of patients were identified as having seizure mimics. The data indicate that while the majority of patients presenting with seizures experience true epileptic events, non-epileptic causes account for a significant proportion. Jackson et al.[3] reported that 17% of patients presented with seizure mimics, with syncope and PNES being the most common causes. In line with the literature, the most frequently observed conditions in our study were syncope (17.6%) and PNES (8.6%).[8,9]

Another important aspect of the initial seizure assessment is the identification of acute symptomatic seizures, which represent a critical differential diagnosis. In our study, we identified acute symptomatic seizures in 15.8% of all analyzed cases, with metabolic derangements being the most common cause (42.4%). Similar rates have previously been reported in the literature.[3,10] In the study conducted by Fields et al.[11] metabolic derangements were identified as the leading cause of new-onset seizures in hospitalized patients, accounting for 25% of cases. The annual incidence of acute symptomatic seizures is estimated to range from 29 to 39 per 100,000 individuals, with the most common etiologies including traumatic brain injury, cerebrovascular diseases, substance withdrawal, and metabolic disorders.[12] The distinction between acute symptomatic seizures and unprovoked seizures significantly impacts both diagnosis and treatment strategies.

The etiology was identified in 56.6% of patients with unprovoked seizures, whereas it remained unknown in 43.4%. In these patients, MRI, as well as both initial and follow-up EEGs, were normal. Advanced investigations during long-term follow-up may aid in identifying the etiology in some of these cases. Not every lesion seen on MRI may be associated with epilepsy. For example, arachnoid cysts, which are detected incidentally in many patients, are not frequently associated with epilepsy. Stroke, traumatic gliotic lesions, tumors, vascular malformations including cavernoma and arteriovenous malformations, mesial temporal sclerosis, metastasis, malformations of cortical development, multiple sclerosis lesions, were considered to be associated with epilepsy.

While the presence of EEG abnormalities supports the diagnosis of epilepsy, a normal EEG does not rule it out. In a prospective study involving 300 older children and adults with a first seizure, 47% of cases were diagnosed based on clinical history and family medical history alone; however, the diagnostic accuracy increased to 77% when EEG data were included.[13] Accurate diagnosis of first seizures is essential for effective seizure management and selection of appropriate treatment options.[7] Therefore, detecting EEG abnormalities in patients with a first seizure can be valuable in the clinical diagnostic process. In our study, the rate of EEG abnormalities among patients with unprovoked seizures was found to be 40.2%. Similar rates have been reported previously in the literature.[14] Most of the patients with IGE exhibited epileptic abnormalities on their EEGs. In the symptomatic focal epilepsy group, 15.75% of EEGs showed epileptiform abnormalities. Consistent with our findings, studies have reported interictal epileptiform discharges (IEDs) in approximately 21-28% of patients with a first seizure.[3,15] Patients with generalized discharges on EEG and a first unprovoked generalized tonic-clonic seizure have a significantly increased risk of seizure recurrence without appropriate treatment.[16] In acute symptomatic conditions, such as those observed in our study, EEG findings are often normal, as these conditions are typically transient and may not be directly associated with epilepsy. Additionally, it is noteworthy that the

rate of EEG abnormalities in healthy individuals without epilepsy ranges from 1% to 2%.[17] These findings may be influenced by factors such as medication use, but can also occur without any identifiable cause.

In addition to the increased frequency of EEG abnormalities in patients with unprovoked seizures, unprovoked seizures tend to be more nocturnal, family medical history is more common, SE is more common, and auras and recurrences are more common. All patients with aura and most patients with nocturnal seizures were confirmed to have true first seizures in our study.

In our study, all patients experiencing nocturnal seizures were classified within the epileptic group. Previous studies have also demonstrated that unprovoked seizures occurring for the first time during sleep carry a higher risk of recurrence, regardless of other risk factors. This risk should be taken into account when making treatment decisions.[18] However, in our study, no significant difference was observed in the rate of nocturnal seizures between the recurrent and non-recurrent groups. This finding may be attributed to the limited number of patients with nocturnal seizures in our cohort.

Determining whether to initiate treatment after a first epileptic seizure can be challenging. Studies indicate that the use of modern ASMs reduces the risk of recurrence by more than 50%, demonstrating a protective effect in the short term.[15] Factors associated with a high-risk of recurrence, as reported in the literature, include remote symptomatic etiologies such as cerebrovascular accidents, perinatal injuries, and central nervous system infections, as well as epileptiform activity on EEG, nocturnal seizures, and potentially epileptogenic lesions on neuroimaging.[4] However, in our study, when the groups with and without seizure recurrence were compared, no significant differences were observed regarding EEG abnormalities, family medical histories and the presence of nocturnal seizures. Seizure recurrence was significantly higher in patients whose first seizure presented as SE. In the literature, mortality was reported to be high (7.7%) in those whose first seizure was SE.[14] Etiologically, seizure recurrence was most frequent in the IGE group. However, although recurrence is common in patients with IGE, the response to treatment has been good after appropriate drug dosage adjustment.

Seizure recurrence was observed in 18.8% of the patients who had their first seizure, but were not started on medication. Current recommendations suggest initiating ASM in patients with newly diagnosed epilepsy. However, the decision to prescribe drugs in patients without a formal diagnosis of epilepsy should be based on individual risk factors for seizure recurrence and the potential complications of seizures. These factors should be carefully discussed with the patient.[19] A study demonstrated that ASM therapy in patients with a single tonic-clonic seizure significantly reduced the likelihood of seizure recurrence over a two-year period. Specifically, treatment reduced the risk of recurrence from approximately 60% to 20% in those with a single seizure. Similarly, research indicates that early treatment after an unprovoked first seizure can reduce the risk of recurrence by approximately 35% in the short term.[20,21]

The management of first seizure patients with an indeterminate etiology remains a subject of ongoing debate. For this group, it is crucial to assess the risk factors associated with seizure recurrence. Studies have identified several factors that increase the risk of recurrence, including abnormal MRI findings suggestive of epileptogenic lesions, nocturnal seizures, and the presence of IEDs on EEG. Conversely, factors such as age, gender, seizure type, and SE were not found to be associated with a higher risk of recurrence.[2,15,22]

However, some studies in teenagers have suggested that SE may be associated with an increased risk of recurrence. These risk factors can vary among individuals, underscoring the need for personalized treatment decisions.[23] It is also well established that patients with a first unprovoked seizure, even in the absence of structural abnormalities on neuroimaging and with normal EEG findings, still face a 20-30% risk of seizure recurrence in the early period.[24,25] The review conducted by Neligan et al.[26] revealed that the risk of seizure recurrence after a single unprovoked epileptic seizure progressively increases over time. The study provides specific estimates of recurrence risk: 27% at six months, 36% at one year, and 43% after two years. These findings highlight the importance of close monitoring, timely treatment, and comprehensive risk assessment in patients following a first unprovoked seizure event.[26]

In our study, pharmacological treatment was initiated in 10 (30.4%) of the patients who experienced acute symptomatic seizures. Even though acute symptomatic seizures do not meet the criteria for epilepsy, ASMs may need to be initiated in some cases. However, caution is necessary regarding the duration and continuity of this treatment. The etiology of an acute symptomatic seizure is important in deciding whether to initiate ASM. A study found that the 12-month cumulative risk of unprovoked seizure recurrence was 10.7% in patients with acute symptomatic seizures of structural etiology, while no unprovoked seizure recurrence was seen in patients with non-structural etiology. Specifically, the cumulative 12-month risk of unprovoked seizure recurrence was 6.4% for ischemic stroke, 12.2% for intracerebral hemorrhage, and 12.2% for acquired CVT.[27] Other studies have also reported that the risk of recurrence may be high in patients with acute symptomatic seizures with CVT.[28] Based on these findings, initiating ASM therapy is recommended for a certain period of time. In the absence of high-risk features, early discontinuation of ASM is advised to prevent overtreatment. However, further clinical guidelines or studies are needed to establish a specific treatment duration.

As a result, the decision to initiate treatment should be tailored to the individual patient, considering their medical history, risk factors, and overall condition following the first seizure. Physicians should carefully evaluate the potential risks and benefits of treatment, ensuring that decisions align with the specific needs and preferences of the patient.[29] In general, early treatment with modern ASMs may offer significant benefits and should be considered, particularly in cases where the risk of recurrence is high. However, the long-term implications of treatment should also be taken into account to avoid unnecessary medication in patients with a lower risk profile.

CONCLUSION

Suspicion of a first seizure is a frequent reason for referral to emergency services and outpatient clinics. However, in our study, in line with the literature, it was observed that seizure mimics or

recurrent seizures can actually be frequently confused with the first seizure. The distinction of acute symptomatic seizures, which constituted a significant portion of first seizures, is important in terms of treatment management.

In conclusion, our primary objective is to propose a fundamental framework for the evaluation and management of first seizures, emphasizing the importance of a systematic and multidisciplinary approach.

Ethics

Ethics Committee Approval: The study was approved by the Local Ethics Committee of the University of Health Sciences Türkiye, Sancaktepe Şehit Prof. Dr. İlhan Varank Training and Research Hospital (approval no: 2023/04, date: 16.01.2023).

Informed Consent: Informed consent was obtained from all patients.

Footnotes

Authorship Contributions

Surgical and Medical Practices: N.Ç., Ü.Z., P.B., Ö.E.Ç., Concept: E.K., N.Ç., Ş.Ş., Ö.E.Ç., Design: E.K., S.D., Data Collection or Processing: E.K., N.Ç., Ü.Z., P.B., S.D., Ş.Ş., Analysis or Interpretation: E.K., Ü.Z., P.B., Ş.Ş., Ö.E.Ç., Literature Search: E.K., S.D., Ö.E.Ç., Writing: E.K., Ö.E.Ç.

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