

Reporting a Remarkable Visual Illusion Due to Temporal Lobe Epilepsy and an Unusual Response to Lamotrigine

Seyed-Ali Mostafavi,¹ Reza Bidaki,^{2,*} and Amin Farzan³

¹Psychiatry Research Center, Roozbeh Hospital, Tehran University of Medical Sciences, Tehran, IR Iran

²Research Center of Addiction and Behavioral Sciences, Shahid Sadoughi University of Medical Sciences, Yazd, IR Iran

³School of Medicine, Shahed Medical University, Tehran, IR Iran

*Corresponding author: Reza Bidaki, Research Center of Addiction and Behavioral Sciences, Shahid Sadoughi University of Medical Sciences, Yazd, IR Iran. Tel: +98-332632004, Fax: +98-353263355, E-mail: Reza_Bidaki@yahoo.com

Received 2015 April 06; Revised 2015 December 14; Accepted 2015 December 14.

Abstract

Introduction: Visual illusions and hallucinations may accompany a wide variety of disorders with many various etiologies; therefore, they are nonspecific phenomena. In a partial seizure, a localized hyper synchronous neuronal discharge evolving into a partial seizure affecting a particular cortical region or cerebral subsystem can give rise to psychotic symptoms like visual hallucination. This case study introduces a patient with metamorphopsia, a rare visual illusion, that was treated with lamotrigine.

Case Presentation: This case study introduces a 34-year-old man with a history of falling. After a while, his seizures became accompanied with aura and, during the attack, he saw people and objects as bloody. He was asymptomatic between the attacks, with no visceral feeling and with dysphoric mood and borderline IQ. He was resistant to various treatments. After 6 months administration of lamotrigine, he has not had any seizure attacks and the psychotic symptoms have improved.

Conclusions: The psychotic symptoms due to temporal lobe epilepsy can be resolved with lamotrigine administration.

Keywords: Lamotrigine, Epilepsy, Temporal Lobe, Optical Illusions

1. Introduction

Epilepsy affects millions of people worldwide and remains one of the most common and fearful neurological conditions. Epilepsy is a group of disorders with various manifestations, including seizure and other signs, symptoms, and presentations that define a phenotype (1).

Visual illusions and hallucinations may accompany a wide variety of disorders with many various etiologies; therefore, they are nonspecific phenomena (2). In partial seizure, a localized hyper synchronous neuronal discharge evolve into a partial seizure affecting a particular cortical region or cerebral subsystem and can give rise to subjective symptoms that are perceived only by the affected person, that is, ictal hallucinations, illusions, or delusions (3).

Individuals suffering from temporal lobe epilepsy have a high prevalence of depression. Depressive symptoms have been estimated in up to 20 - 55% of individuals that have temporal lobe epilepsy (2, 4).

Epilepsy may be misdiagnosed if it presents as psychiatric symptoms or seizures in patients with known psychiatric disorders (5).

Positive or negative visual manifestations such as hallucinations may be seen as major neuro-ophthalmologic presentations. There is significant overlap of the visual manifestations with aura in a migraine and transient ischemic attack (6).

This case study introduces a patient with metamorphopsia, a rare visual illusion, that was treated with lamotrigine.

2. Case Presentation

The case was a 34-year-old man, right-handed, married, and employed, with low socioeconomic status and a history of migration. He was born prematurely, with no history of febrile seizure or intracranial infections. He was referred by a neurologist to a psychiatrist due to a childhood history of seizures and unconsciousness, followed by falling down. Then, his seizure had been initiated with aura, and he saw people and objects during the attack as a bloody color and felt aggression and fearfulness for 8 - 20 minutes. He was asymptomatic between the attacks, with no visceral feelings and with dysphoric mood and an intellectual borderline IQ without behavioral disturbances, but the frequency of attacks gradually accelerated to nearly once a day.

He had poverty of content of thought, decreased appetite, and psychomotor retardation. The neurological and ophthalmological examinations were intact.

The diagnosis was temporal lobe epilepsy because of waves in the temporal area. Dysrhythmic waves were detected in an electroencephalogram (EEG) study of the tem-

poral lobe region. The EEG findings for temporal lobe epilepsy were established by a neurologist. Brain imaging showed no abnormal findings. A brain magnetic resonance imaging (MRI) was intact. No abnormal biochemical indices in laboratory studies were found.

The patient did not respond to tablet Na-valproate given 200 mg twice a day for 4 months, but he responded to 200 mg Na-valproate and 50 mg lamotrigine given twice a day and 5 mg aripiprazole at night. During the recent year, he had referred to some neurologists and psychiatrists. They prescribed him Na-valproate, primidone, phenytoin, phenobarbital, and gabapentin, but none of them treated epilepsy and psychotic-like symptoms. Because the patient did not respond to conventional anticonvulsant therapies and had a depressed mood, we decided the use of lamotrigine, which has antidepressant and anticonvulsant effects. We noticed a dramatic, unusual, and unpredictable response to this drug. After 6 months from initiating lamotrigine, he no longer experiences seizure attacks and illusions and has not reported the attack with the bloody color and aggression again. He had insight about problems. Through prescription of lamotrigine, both the epilepsy and illusion were resolved. He has not had a skin rash following lamotrigine use, and routine laboratory tests were normal. He did not present a sick role or primary or secondary illness behavior. Therefore, factitious disorder and malingering were ruled out. This unusual effect of lamotrigine in control of temporal lobe epilepsy, and especially illusion and hallucination, is remarkable in this case.

3. Discussion

Illusions may occur in healthy persons, but they are found most often in patients with epilepsy, migraine, and stroke (2). Visual illusions include macropsia (perception of objects bigger than their real size), micropsia (perception of objects smaller than their real size), metamorphopsia (perception of objects with distortions of form, size, or color), and palinopsia (visual preservation of an image long after the cessation of the visual stimulus) (7).

The occipital lobe is associated with visual function and the temporoparietal junction also may be involved (7). Visual illusions and hallucinations are thought to originate from the visual cortex and its associated temporoparietal junction (7). This is aligned with our findings of dysrhythmic waves detected in the EEG study of the temporal lobe region.

This study introduced a patient with temporal lobe epilepsy with rare psychotic symptoms like visual illusion. This phenomenon expressed before a seizure and remained for the duration of it. The patient had insight about it. It caused emotional distress and bad feelings for

him, but he had no behavioral disturbances following it. He saw that objects and humans around him were like blood (metamorphopsia). He had fear following this condition. This case with visual illusion reported a distortion of visual perception: objects seemed bloody and their size was changed.

The brain imaging was normal; therefore, brain lesions such as tumors were ruled out. An important differential diagnosis of schizophrenia is temporal lobe epilepsy, but the patient did not meet the criteria for the schizophrenia spectrum. The abnormal waves were specific in the posterior lateral temporal region, and therefore, the other types of epilepsy were ruled out.

Patients with epilepsy with controlling seizure outcome experience an improved health-associated quality of life after treatment (8). Epilepsy produces remarkable changes in the personality, but our patient did not experience any change in personality.

Depression is also common in patients with epilepsy and has been associated with epilepsy of the temporal area, especially of the left-sided region (9). We similarly found depressed mood, psychomotor retardation, and signs of fatigue in the patient.

Ictal hallucinations are best treated by controlling seizure with anticonvulsive drugs (10). But the patient did not respond to valproate alone. Lifestyle issues and compliance are important key points for successful treatment of epilepsy (11).

Valproate is the conventional antiepilepsy drug (AED) of choice for the treatment of idiopathic epilepsies. Guides in epilepsy therapy say if valproate alone fails to control seizures in adequate dosage, then consider early add-on therapy. With the introduction of relatively newer AEDs such as lamotrigine, the treatment choices are expanded (11). We also intended to treat both visual illusions and depression; thus, we decided to use an anticonvulsant and mood stabilizer, which also can be used as an add-on in treating depression. Lamotrigine is a sodium channel blocker antiepileptic drug with a broader spectrum of action than carbamazepine and phenytoin and with fewer side effects. It also can be effective in the treatment of depression. Since Na-valproate and aripiprazole increase the blood levels of lamotrigine, we started with lower doses; fortunately, a good dose response was observed in follow-ups so the dose was kept modest. The basis for a broader spectrum of action of lamotrigine compared to other sodium channel blockers is proposed to be partial effects on high-voltage-activated calcium channels (12). More studies are needed to elucidate the exact reason for the broader range of action for lamotrigine compared to carbamazepine and phenytoin. We know the anticonvulsants may decrease these symptoms overall.

Some case reports noticed that lamotrigine can induce hallucination and illusions (13, 14). But as a contradictory effect, we found no hallucinations after lamotrigine prescription. Roberts et al. (13) studied a 14-year-old-girl without head injury, with a normal MRI, and with abnormal EEG showing brief and generalized polyspikes and wave activity in both hemispheres, predominantly originating from the left hemisphere. After several months of valproic acid (375 mg t.i.d.) and amitriptyline, lamotrigine (25 mg) was added. Seven days later, she reported auditory hallucination. In our case, the patient was different in history (visual hallucination after falling down) and diagnosis (temporal lobe epilepsy). Brandt et al. (14) also reported development of psychosis in patients with experience of positive psychotropic effects treated with lamotrigine. Rudolf and Hugh (15) reported worsening hallucination following lamotrigine administration in a patient with bipolar disorder, but our case had depressive mood. Furthermore, in our study, hallucination has occurred at the background of temporal lobe epilepsy and responded to lamotrigine, which in fact, has reduced hallucination. Needham (16) reported a 27-year-old female with diagnosis of psychosis of epilepsy that responded well to lamotrigine and amisulpride treatment. However, the current article reports a dramatic unusual response to lamotrigine and suggests that patients with temporal lobe epilepsy and visual illusions should be assessed for other organic problems and lamotrigine may be effective in improving these symptoms in certain conditions.

Footnote

Authors' Contribution: Seyed-Ali Mostafavi: writing, editing, and submitting the article; Reza Bidaki: visiting and treating the case, and writing and editing the article; Amin Farzan: writing the primary draft.

References

- Magiorkinis E, Sidiropoulou K, Diamantis A. Hallmarks in the history of epilepsy: epilepsy in antiquity. *Epilepsy Behav.* 2010;17(1):103-8. doi: [10.1016/j.yebeh.2009.10.023](https://doi.org/10.1016/j.yebeh.2009.10.023). [PubMed: [19963440](https://pubmed.ncbi.nlm.nih.gov/19963440/)].
- Elliott B, Joyce E, Shorvon S. Delusions, illusions and hallucinations in epilepsy: 1. Elementary phenomena. *Epilepsy Res.* 2009;85(2-3):162-71. doi: [10.1016/j.eplepsyres.2009.03.018](https://doi.org/10.1016/j.eplepsyres.2009.03.018). [PubMed: [19423297](https://pubmed.ncbi.nlm.nih.gov/19423297/)].
- Kasper BS, Kasper EM, Pauli E, Stefan H. Phenomenology of hallucinations, illusions, and delusions as part of seizure semiology. *Epilepsy Behav.* 2010;18(1-2):13-23. doi: [10.1016/j.yebeh.2010.03.006](https://doi.org/10.1016/j.yebeh.2010.03.006). [PubMed: [20483670](https://pubmed.ncbi.nlm.nih.gov/20483670/)].
- Dube CM, Brewster AL, Richichi C, Zha Q, Baram TZ. Fever, febrile seizures and epilepsy. *Trends Neurosci.* 2007;30(10):490-6. doi: [10.1016/j.tins.2007.07.006](https://doi.org/10.1016/j.tins.2007.07.006). [PubMed: [17897728](https://pubmed.ncbi.nlm.nih.gov/17897728/)].
- Mirsattari SM, Gofton TE, Chong DJ. Misdiagnosis of epileptic seizures as manifestations of psychiatric illnesses. *Can J Neurol Sci.* 2011;38(3):487-93. [PubMed: [21515510](https://pubmed.ncbi.nlm.nih.gov/21515510/)].
- Bajwa R, Jay WM, Asconape J. Neuro-ophthalmologic manifestations of epilepsy. *Semin Ophthalmol.* 2006;21(4):255-61. doi: [10.1080/08820530601006742](https://doi.org/10.1080/08820530601006742). [PubMed: [17182413](https://pubmed.ncbi.nlm.nih.gov/17182413/)].
- Giannakodimos S. Occipital Lobe Epilepsies. *Atlas of Epilepsies.*; 2010. pp. 1207-13.
- Fayed N, Davis AM, Streiner DL, Rosenbaum PL, Cunningham CE, Lach LM, et al. Children's perspective of quality of life in epilepsy. *Neurology.* 2015;84(18):1830-7. doi: [10.1212/WNL.0000000000001536](https://doi.org/10.1212/WNL.0000000000001536). [PubMed: [25841031](https://pubmed.ncbi.nlm.nih.gov/25841031/)].
- Quiske A, Helmstaedter C, Lux S, Elger CE. Depression in patients with temporal lobe epilepsy is related to mesial temporal sclerosis. *Epilepsy Res.* 2000;39(2):121-5. [PubMed: [10759300](https://pubmed.ncbi.nlm.nih.gov/10759300/)].
- Farkas M, Baran B, Karpati R, Rajna P. [Utility of electroshock therapy in epilepsy-associated psychosis]. *Ideggyogy Sz.* 2002;55(11-12):400-5. [PubMed: [12632801](https://pubmed.ncbi.nlm.nih.gov/12632801/)].
- Nicolson A, Marson AG. When the first antiepileptic drug fails in a patient with juvenile myoclonic epilepsy. *Pract Neurol.* 2010;10(4):208-18. doi: [10.1136/jnnp.2010.217976](https://doi.org/10.1136/jnnp.2010.217976). [PubMed: [20647527](https://pubmed.ncbi.nlm.nih.gov/20647527/)].
- Dibue-Adjei M, Schneider T. In response: Cav2.3 (R-type) calcium channels are critical for mediating anticonvulsive and neuroprotective properties of lamotrigine in vivo. *Epilepsia.* 2015;56(7):1181. doi: [10.1111/epi.13040](https://doi.org/10.1111/epi.13040). [PubMed: [26149801](https://pubmed.ncbi.nlm.nih.gov/26149801/)].
- Roberts CK, Davenport R, Patel HN, Patel NC. Hallucinations during lamotrigine treatment. *Nurse Pract.* 2008;33(3):12-3. doi: [10.1097/01.NPR.0000312994.16081.39](https://doi.org/10.1097/01.NPR.0000312994.16081.39). [PubMed: [1838826](https://pubmed.ncbi.nlm.nih.gov/1838826/)].
- Brandt C, Fueratsch N, Boehme V, Kramme C, Pieridou M, Villagran A, et al. Development of psychosis in patients with epilepsy treated with lamotrigine: report of six cases and review of the literature. *Epilepsy Behav.* 2007;11(1):133-9. doi: [10.1016/j.yebeh.2007.03.015](https://doi.org/10.1016/j.yebeh.2007.03.015). [PubMed: [17485241](https://pubmed.ncbi.nlm.nih.gov/17485241/)].
- Rudolf U, Hugh M. Hallucinations during lamotrigine treatment of bipolar disorder. *Am J Psychiatry.* 2006;163(4):749-50. doi: [10.1176/appi.ajp.163.4.749-a](https://doi.org/10.1176/appi.ajp.163.4.749-a). [PubMed: [16585461](https://pubmed.ncbi.nlm.nih.gov/16585461/)].
- Needham E, Hamelijncck J. Temporal lobe epilepsy masquerading as psychosis—a case report and literature review. *Neurocase.* 2012;18(5):400-4. doi: [10.1080/13554794.2011.627338](https://doi.org/10.1080/13554794.2011.627338). [PubMed: [22124330](https://pubmed.ncbi.nlm.nih.gov/22124330/)].