

Neuropsychiatric Manifestations of Juvenile Absence Epilepsy as a Diagnostic Challenge

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Abstract: Background: Bipolar Disorder is a psychiatric illness characterized by manic or hypomanic episodes. Juvenile Absence Epilepsy is an idiopathic epilepsy syndrome characterized by absence seizures and generalized tonic clonic seizures beginning in adolescence around puberty. Epilepsy can present with behavioral symptoms that resemble psychiatric disorders, creating diagnostic challenges. Case Presentation: We present a 21 year old patient with known Juvenile Absence Epilepsy who developed episodes of erratic behavior and was diagnosed with Bipolar Disorder after an episode associated with stimulant abuse. Lamotrigine was used for seizure control, while psychiatric treatment was initially added for mood symptoms. During elective electroencephalographic monitoring, manic appearing behavior was observed immediately before an absence seizure, establishing a temporal relationship between the behavioral changes and seizure episodes. After seizure treatment was intensified, the mood and behavioral episodes ceased. Discussion and Conclusions: Epilepsy can produce neuropsychiatric changes through effects on brain regions including the prefrontal cortex, limbic system and temporal lobe. From observation alone, it may be difficult to determine whether impaired functioning is psychiatric or neurological. This case highlights the importance of considering epilepsy in the differential diagnosis of abnormal behavior.

Keywords: juvenile absence epilepsy; neuropsychiatric manifestations; bipolar disorder; seizure related behavior; diagnostic challenge

1. INTRODUCTION

Bipolar Disorder is a psychiatric illness characterized by the presence of manic or hypomanic episodes. A manic episode is defined as a distinct period of abnormally and persistently elevated, expansive, or irritable mood and abnormally and persistently increased activity or energy, lasting at least 1 week and present most of the day, nearly every day. During this time period, a patient may exhibit grandiosity, a decreased need for sleep, increased talkativeness, flight of ideas or racing thoughts, distractibility, increased goal directed activity or psychomotor agitation, and excessive involvement in activities that have a high potential for painful consequences [1].

Bipolar Disorder is a chronic illness and has a 12 month prevalence of 2.8 percent in the continental United States [2]. A hallmark feature of Bipolar Disorder is intense shifting of mood between mania and depression. This shifting personality can also be seen in other psychiatric conditions such as reactive depression or borderline personality disorder, as well as in neurological conditions such as traumatic brain injury or brain tumours [3]. Although patients may have full function between episodes, approximately 30 percent show severe impairment in work role function [1]. Thus, accurate and timely diagnosis is important for management.

Juvenile Absence Epilepsy is an idiopathic epilepsy syndrome characterized by absence seizures and generalized tonic clonic seizures beginning in adolescence around puberty [4]. Absence seizures present with sudden impairment of consciousness with automatisms or mild clonic, atonic and tonic components [4]. The prevalence of Juvenile Absence Epilepsy is reported to be 1 to 2 percent of all childhood epilepsies [4]. The presence of generalized tonic clonic seizures indicates a poorer prognosis for treatment [4]. This is a chronic condition that requires lifelong treatment with anti epileptic drugs, notably Lamotrigine.

Personality changes and mood symptoms have been documented in numerous cases of epilepsy [5,6]. These psychiatric effects can be associated with the peri ictal, interictal or postictal phases of epilepsy [7]. Previous studies have linked temporal lobe epilepsy with frontal lobe dysfunction, manifesting as deficits in executive planning and working memory [3,6]. Temporal lobe epilepsy also has a clear link to comorbid major depressive disorder, which is thought to be due to effects on temporal limbic circuits in the brain [3]. As a result, there is continued morbidity even outside of seizure activity in epilepsy.

Many previous studies have examined the link between psychopathology and epilepsy [3,5]. In temporal lobe epilepsy in particular, there are increased reports of

personality changes and comorbid mood disorders, mainly depression [3]. This neuropsychiatric overlap can lead to abnormal behavior being misdiagnosed as affective disorders [5]. There is a need for more literature on apparent manic symptoms displayed in epileptic disorders. We present a case of a patient with Juvenile Absence Epilepsy who had an episode of erratic behavior mimicking a manic episode, resulting in an erroneous diagnosis of Bipolar Disorder.

2. CASE PRESENTATION

This is the case of a 21 year old female with a previous history of ADHD and seizure disorder who presented with new onset manic symptoms. The patient was initially diagnosed with absence epilepsy in childhood. As an adolescent, the patient began treatment for ADHD with stimulant medication. Seizures and ADHD symptoms remained relatively stable during this time. At the age of 16, however, the patient had a generalized tonic clonic seizure for the first time. This seizure began with the patient speaking incoherently, then collapsing and having a 1 minute episode of eye rolling and arm shaking, with subsequent postictal confusion. From thorough history taking, it was revealed that prior to the onset of the tonic clonic episode, the patient was abusing stimulants for college exams and this likely precipitated the seizure.

In addition to this seizure, the patient began having multiple episodes of elevated mood, impulsive behavior and incoherent speech. She was subsequently diagnosed with Bipolar Disorder when she was hospitalized three times due to mania during her freshman year of college. The patient was started on Lithium 300 mg daily in addition to Lamotrigine 200 mg twice daily for seizure control. Since then, she was managed as an outpatient for symptoms such as intense anger, excitement or sadness, as well as episodes of incoherent speech and disorganized behavior of roaming around the house. She also had signs of poor executive function and decision making. She continued to have mood episodes during periods of noncompliance with medication or substance abuse, particularly with stimulants or alcohol.

Pharmacologic treatment was continually adjusted to better manage both seizure and mood symptoms. For epilepsy, Lamotrigine was started at 200 mg twice daily and eventually uptitrated to 600 mg daily to achieve therapeutic serum levels. Oxcarbazepine 150 mg was briefly added for seizure control until the dose of Lamotrigine increased. For manic symptoms, Lithium 300 mg daily was started and then increased to twice daily. Lorazepam 0.5 mg twice daily was also initiated to manage anxiety symptoms.

The patient was eventually stabilised on Lamotrigine 200 mg twice daily, Lithium 300 mg ER at night, Lorazepam 1 mg at night, and Aripiprazole 960 mg IM every 2 months. This regimen adequately managed her mood symptoms and seizures.

However, to investigate breakthrough seizures, the patient had an elective hospital stay for EEG monitoring and seizure event capture. On observation, the patient began displaying manic symptoms of rambling disorganized speech, as well as intense anger and irritability. This was followed by an absence

seizure. There was no recollection of the event by the patient, and it was shown that the patient's symptoms occurred in tandem with her seizure episodes.

It was then decided that the patient's psychiatric medications would be discontinued and Lamotrigine would be uptitrated to prevent more seizure episodes, which would in turn treat the patient's behavioral changes. At the most recent clinic visit, the patient displayed no symptoms of mania. On Mental Status Examination she displayed euthymic mood and no disorganized speech, restlessness or impulsivity. No abnormalities in thought processes such as flight of ideas were present. She reported compliance with medications with no major side effects. Of note, the patient reported no new seizure episodes since the new medication dosage.

3. DISCUSSION

This case is a prime display of the neuropsychiatric overlap of epilepsy disorders and affective disorders. The patient displayed episodic mood symptoms ranging from intense feelings of anger, euphoria and sadness, to impulsivity and poor decision making and even incoherent and rambling speech. This aggregation of symptoms led to a diagnosis of Bipolar Disorder. However, upon further workup, the symptoms were linked to the patient's seizure episodes and treatment for bipolar was halted; symptom resolution was achieved upon seizure control.

As mentioned before, it is a well documented phenomenon for mood symptoms to be linked to epilepsy [5,6]. Psychiatric symptoms of behavioral disturbance, altered mental status or personality change can occur at any point during a seizure episode. However, these changes can also occur during seizure free periods. Some research has theorized that this can be due to long term effects on neural circuits in chronic epilepsy, especially in patients who have had a higher seizure burden in their lifetime. The neurochemical changes related to both neuronal excitation and seizure inhibition are likely mechanisms by which these neural circuits are altered [3]. Thus, depending on the affected regions of the brain, a patient may display varying psychiatric phenomena.

There is evidence to show that common areas affected in epilepsy are the frontal lobe, temporal lobe and limbic system [3,5,6]. Dysfunction in these neural regions may correlate with behavioral changes that can mimic Bipolar Disorder. In the frontal lobe, specifically the prefrontal cortex, deficits can lead to disinhibition, impulsivity and poor planning due to executive dysfunction [3,5]. This can explain our patient's abnormal behavior of rapid and incoherent speech, as well as her history of substance abuse. In cases of temporal lobe insults, specifically involving limbic system structures, the patient experienced intense outbursts of anger and sadness. With this constellation of symptoms, the clinical presentation can resemble Bipolar Disorder.

There is a known phenomenon of postictal mood symptoms, which can manifest as Postictal Psychosis or Postictal Mania. Postictal mania is characterized by symptoms such as elated, expansive mood, euphoria and distraction of thought process [7]. These cases have again been exclusively linked to

temporal lobe epilepsy. Thus, while neuropsychiatric phenomena in temporal lobe epilepsy are well documented in the scientific literature, there is a lack of research on this in Juvenile Absence Epilepsy.

The diagnosis of Bipolar Disorder in this patient likely represented symptom overlap rather than a primary mood disorder. The key differentiator is the relationship between the seizures and the appearance of mood symptoms. There were only new manic episodes when the patient had a seizure. This relationship was missed initially as the patient likely had far more seizures than she recalled. This history of abnormal behavior is thus a sequela of neurological dysfunction rather than episodic mood pathology [3].

Although this is a singular case and therefore lacks generalizability and strong evidence of a causal relationship, it provides insight into the phenomenon of psychiatric manifestations of epilepsy. While Juvenile Absence Epilepsy is a less common subtype of epilepsy disorders, it remains an important area to be studied and researched.

4. CONCLUSION

There is a well documented link between epilepsy and psychiatric symptoms. Juvenile Absence Epilepsy is characterized by lifelong seizure episodes while Bipolar Disorder is characterized by the presence of manic episodes. This case highlighted the difficulty in diagnosis of behavioral problems in epilepsy disorders. The patient's hyperactive behavior and disorganized speech were interpreted as manic episodes due to Bipolar Disorder, but upon further review were linked to personality changes associated with the patient's seizures of Juvenile Absence Epilepsy. Further research into the overlap of epilepsy, behavior and personality change will help contribute to accurate and timely diagnosis of psychiatric conditions.

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