



## Levetiracetam Induced Acute Psychosis in a Patient with Juvenile Myoclonic Epilepsy

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### Abstract

We report a case of a 22 year old female patient who presented with altered behaviour in the form of anxiety, irritability and agitation for two days. Patient was a diagnosed case of juvenile myoclonic epilepsy for past 10 years on valproate therapy. Patient had been switched to Levetiracetam (1500 mg daily) two weeks back in view of valproate induced side effects. Formal psychiatric evaluation suggested acute psychosis possibly Levetiracetam induced. Levetiracetam was stopped and replaced with lamotrigine. Patient dramatically improved over next two days and became asymptomatic.

**Keywords:** Levetiracetam; Psychosis; Juvenile Myoclonic Epilepsy

### Introduction

Levetiracetam is generally safe and well tolerated but various behavioural side-effects are known to occur. They include agitation, anxiety, depression, hallucinations, and psychosis.

### Case Report

We report a case of a 22 year old female patient who presented with altered behaviour in the form of anxiety, irritability and agitation for two days. She was accusing her parents of conspiring to kill her. She also claimed of seeing a weapon in her mother's hands in neurology clinic. She was hitting her parents and attending doctors with objects around and even broke her mother's tooth. Patient was a diagnosed case of juvenile myoclonic epilepsy for past 10 years. She was taking sodium valproate 800 mg daily in divided doses. Patient had been switched to Levetiracetam (1500 mg daily) two weeks back in view of valproate induced side effects including hair loss, weight gain and irregular menses. There was no history of preceding fever, neck pain, vomiting, fresh seizure episode or head trauma. There was no history of substance abuse,

psychosis, depression or any other psychiatric illness in the past. On neurological examination, neck rigidity was absent; cognition was normal except for mild attention deficit. There was no sensorimotor deficit or any lateralizing sign. Other systemic examination was also normal. Formal psychiatric evaluation suggested acute psychosis possibly Levetiracetam induced. Routine blood investigations including blood counts, metabolic profile and urine drug screen were normal. Serum Levetiracetam level was also within normal range (26 mg/L; normal range 12 - 46 mg/L). Magnetic resonance imaging of brain, electroencephalogram and cerebrospinal fluid examination were normal. Levetiracetam was stopped and replaced with lamotrigine; also tablet olanzapine was added as per the advise of psychiatrist. Patient dramatically improved over next two days and became asymptomatic. Patient was discharged on lamotrigine in stable condition. In the background of clinical symptomatology, temporal relationship with recent AED switch-over, exclusion of common metabolic and infective causes, normal neuroimaging and resolution of symptoms following drug withdrawal, possibility of Levetiracetam induced psychosis is high in our case.

## Discussion

Levetiracetam is a water-soluble pyrrolidone derivative ((S)-alpha-ethyl-2-oxo-pyrrolidine acetamide) with a unique mechanism of action [1]. It modulates synaptic neurotransmitter release by binding to synaptic vesicle protein SV2A, and inhibiting calcium release from intra-neuronal stores [2]. It also blocks zinc and beta-carbolines from inhibiting GABA and glycine receptors [2]. It's normal plasma concentration ranges from 5.95 mg/L to 42.5 mg/L (35 mM to 250 mM) [3]. It is generally safe and well tolerated but various behavioural side-effects are known to occur. They include agitation, anxiety, depression, hallucinations, and psychosis [2,4]. It can cause psychiatric side effects in up to 13.3 percent of adults and 37.6 percent of paediatric patients. Severe symptoms such as depression, agitation, and psychotic behaviour are observed in 0.7 percent of these patients [5]. The underlying pathogenesis for these side effects is yet not entirely clear. Factors which have been found to increase the risk of these adverse effects include young age, history of febrile seizures, drug refractory epilepsy, previous psychiatric history, baseline cognitive dysfunction and rapid escalation of Levetiracetam dose [2,4].

## Conclusion

Caution should be exercised while prescribing Levetiracetam to such patients; treating clinician should always be watchful of neuropsychiatric side effects in patients on Levetiracetam therapy.

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