International Journal of Research and Review
www.ijrrjournal.com E-ISSN: 2349-9788; P-ISSN: 2454-2237

Case Report

Continuous Spike-Wave of Slow Sleep for 8 Year Old Child- A Case Report

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ABSTRACT

Electrical status epileptics is an age-related and self-limiting syndrome described as slowing of waves during sleep with any type of seizure and rapid eye movement associated with continuous electrical activity. The cardinal signs involve status epileptics with seizure cognitive and motor impairment. This slowing of the wave is the result of switching of $GABA_A$ related inhibitory postsynaptic potential to $GABA_B$ mediated inhibitory postsynaptic activity. Hyperthermia, pulmonary edema, cardiac arrhythmias and cardiac collapse are acute complications, where encephalopathy and focal neurological deficit are long term complications. It can be controlled with valproate, levetiracetam, lamotrigine, ethosuximide and clobazam.

Keywords: Electrical status Epilepticus, Slowing of waves, Seizure

INTRODUCTION

Electrical status epileptics also called continuous spike-wave of slow sleep, is an age-related and self-limiting syndrome, mainly characterized by the change in the electroencephalogram. It is described as slowing of waves during sleep, associated with neurocognitive deterioration with any type of seizure and rapid eye movement associated with continuous electrical activity. [(1,2)] Even though these types of epilepsies are idiopathic the seizure may contribute due to the following reason: early developmental lesion as vascular in situs, especially affecting the thalamus or malformation of cortical development and genetic factors mutation in the GRIN2A gene. [(3,4)]

The cardinal signs involve status epileptics with seizure cognitive and motor impairment. The continuous paroxysmal discharge of spike-wave complex with the frequency of 1.5-2.5 Hz which persists through all the slow sleep stage. The seizure may contribute to unilateral tonic-clonic seizure or clonic typically occurs during sleep. Even though it is self-limiting disorder the early diagnosis is important because the late diagnosis can lead to permanent cognitive impairment. [2]

The 2014 data suggest that electrical status epileptics is a rare condition that affects only 0.5-1.5% of children with epilepsy (in some series) and having a male-female ratio of 3:2. [5]

The goal of the therapy is to control seizures. High doses of benzodiazepine-like diazepam or clobazam are successful in achieving the goal. The other antiepileptic drug which used more is valproate, levetiracetam, lamotrigine, and ethosuximide. The non-epileptic drug which is used for electrical status epileptics include

corticosteroid, but this therapy is associated with a long term side effect.

The non-pharmacological therapy includes epilepsy surgery- is an efficient therapy in selected cases even when epileptic form discharge is bilateral. [6]

CASE REPORT

An 8-year-old female patient was admitted to our hospital with complaints of convulsion episodes which lasting for 5 min associated with an upward rolling eye, vomiting on each episode. The patient was having a loss of consciousness after 5 min of convulsion. The seizure was associated with involuntary urination.

From counseling with the patient was confirmed that the patient hasn't experienced an episode of seizure. The patient was apparently normal before 20 days and then she developed a seizure. She was admitted to a government hospital near to her town and they managed with sodium valproate 200mg. The patient again developed episodes of seizure and referred to the tertiary care hospital. There they managed with injection midazolam as slow stat dose and sodium valproate to control status epilepsy. During sleep, the patient subjected to Electroencephalogram (EEG). The EEG revealed the slowing of the wave with a spike of 2.0 Hz. From the EEG the electrical status epilepticus was confirmed. The patient CBC, Serum calcium, urine routine, Liver Function Test and Renal Function Test were found to be normal. The patient's birth history is normal and does not have any allergy or contact to tuberculosis and her vaccination is up to date.

After confirmation of the diagnosis, the patient treated with levetiracetam and corticosteroid for 2 days. Then the patient became normal and discharged.

DISCUSSION

Continuous spike-wave of slow sleep is a rare disorder also known as electrical status epilepticus. Even though these are self-limiting, which resolves by age the early management is necessary to reduce its cardiac and other complications. Hyperthermia, pulmonary edema, cardiac arrhythmias and cardiac collapse are acute complications, where encephalopathy and focal neurological deficit are long term complications.

The pathogenesis which contributes to electrical status epileptics involves the pathologically hyperactive oscillatory rhythm of the corticothalamic network. The reticular thalamic neuron of the spinoreticular tract provides inhibitory GABAergic input while dorsal thalamic nuclei-glutaminergic neurons provide excitation. The interplay between these two resulting pathologically hyperactive oscillatory rhythm of the thalamus which contribute to the electrical status epileptics. The presence of inhibiting oscillary property by the reticular system the 'slow-wave' is absent during awake. Disinhibition of the circuit is the contributing factor for the slowing of the wave during sleep.

This slowing of the wave is the result of switching of $GABA_A$ related inhibitory postsynaptic potential to $GABA_B$ mediated inhibitory postsynaptic activity.

Since the GABA receptor plays an important role in electrical status epilepticus the valproic acid plays an important role in controlling seizure by inhibiting GABA transaminase, thereby increasing the concentration of the GABA in the brain and inhibits presynaptic and postsynaptic discharge.

CONCLUSION

The electrical status epilepticus is an age related-self-limiting disorder, the proper identification and updated apt treatment are necessary to prevent complications.

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How to cite this article: Mohan KS, Jose M, Joy C et.al. Continuous spike-wave of slow sleep for 8 year old child- a case report. International Journal of Research and Review. 2019; 6(11):581-583.

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