Case Report

PROPOFOL INDUCED SEIZURE LIKE PHENOMENON DURING MODIFIED ELECTROCONVULSIVE THERAPY -A CASE REPORT

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Abstract

Background: Propofol is an intravenous anesthetic that is said to have anticonvulsant properties. This is a case report of the propofol-induced seizure-like phenomenon (SLP) during modified (MECT). **Case Report:** A 24-year-old female with severe depression without psychotic symptoms and borderline personality disorder underwent six sessions of MECT. During the earlier session of MECT using thiopentone as an anesthetic, a prolonged seizure occurred, indicating a low seizure threshold. Then it was changed to propofol. When propofol was given as an induction agent, even before giving ECT, the patient developed seizure-like involuntary jerking movements. EEG and MRI were done after the fourth session and were found normal. **Discussion:** This case report highlights that even though propofol has anticonvulsant activity, few cases of SLP during procedures have been reported. Propofol-induced SLP during MECT is the first of its kind.

Keywords: Propofol, Modified Electroconvulsive Therapy (MECT), Seizure, Seizure like Phenomenon (SLP)

INTRODUCTION

Seizure activity, excitatory phenomena, or a muscle tone disorder are potential complications of propofol. Despite its anticonvulsant activity, propofol can produce involuntary movement disorder in certain patients.[1] Propofol is an intravenous sedative-hypnotic agent with a modulating action on the γ-aminobutyric acid (GABA) A receptor.[2] The use of propofol in seizure disorder patients is controversial as it has pro convulsant effect. Propofol-induced seizure-like phenomena are observed in patients with and without seizure disorders when used as induction agents for procedural sedation.[3-6] A contradicting study showed that propofol reduces seizure duration during ECT.[7] We report a case of seizure-like phenomenon when propofol is used as an induction agent for anesthesia during electroconvulsive therapy (ECT).

CASE REPORT

24-year-old female, coming from an upper middle socioeconomic status, married and employed, presented with persistent sad mood, decreased sleep, diminished self-confidence, decreased interest in once-enjoyed activities, and low energy for three weeks. She also expressed severe death wishes and suicidal ideations, having made two impulsive suicide attempts within the last week before admission. Her history noted difficulties with frustration tolerance and a maladaptive pattern of response to stress with self-injurious behaviors, feelings of emptiness, and unstable relationships. There is a family history of bipolar affective disorder in the

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mother, who committed suicide, and a second-degree relative with a history of seizure disorder; however, the patient has no personal history of seizures.

On physical examination, she was found to be unremarkable. The mental status examination revealed feelings of emptiness, helplessness, and worthlessness, along with suicidal plans by hanging. The patient exhibited a sad mood without perceptual abnormalities. A diagnosis of severe depression without psychotic symptoms and borderline personality disorder was made according to ICD 10 criteria and was started on sertraline 25 mg per day. Since the patient had severe death wishes and suicidal ideations, she was admitted to the psychiatry ward and prepared for modified electroconvulsive therapy (MECT).

The patient underwent six MECT sessions, scheduled as three sessions per week, under general anesthesia. During the first session of MECT, thiopentone was used as an induction agent with bitemporal electrode placement. Seizures of >55sec were obtained in the lead two, stopped using injection of midazolam, indicating a low seizure threshold; for the fourth session of MECT, when propofol was given as an induction agent, even before giving MECT, the patient developed seizure-like involuntary jerking movements, of cuffed right upper limb lasted for >30 sec stopped by injection midazolam. Fifth and sixth sessions of MECT were given with thiopentone as the induction agent, and no induction seizures were noted. EEG and MRI were done after the fourth session and were found normal. Neurology evaluation was done and advised CSF study with NMDA to rule out autoimmune encephalitis but patient and bystander were not willing. The patient symptomatically improved and was discharged on antidepressant sertraline 50mg per day after three weeks of hospital stay.

DISCUSSION

Propofol is a short-acting lipophilic anesthetic that has been used to treat refractory status epilepticus. Although it possesses anticonvulsant properties, there have been reports of propofol-induced seizure-like phenomena (SLP).[8] This unusual motor response is secondary to antagonism of glycine receptors located in subcortical structures or toxic metabolites from altered propofol metabolism. Such movements usually occur at lower doses of propofol and may also be linked to allergic reactions to propofol.[8] Cases of propofol-induced seizure-like phenomena have been reported during surgical procedures postoperatively and in emergency departments where propofol is used for procedural sedation.[9] Additionally, there is a documented case where refractory status epilepticus was induced intraoperatively when propofol was used as an induction agent for anesthesia.[10] However, the exact mechanism by which propofol causes SLP remains unknown. A limitation of this case report is that both the patient and bystander were unwilling to undergo further neurological evaluation and investigation to rule out autoimmune disorders and other organic causes that could have led to this seizure-like phenomenon. Nonetheless, to our knowledge, this is the first reported case of propofol-induced seizure-like phenomena during modified electroconvulsive therapy.

Conflict of Interest: Rajmohan Velayudhan: The article was submitted on 30 July 2024. On 12 August, the author became editor-in-chief of the Journal. Adhering to COPE Guidelines, the previous editor and section editor processed and made decisions on the article. The current editor-in-chief was not involved in any processing or decision-making phase.

The other authors have no conflict of interest

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