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CASE REPORT

Perspectives in PSYCHIATRIC CARE WILEY

Prolonged post-ECT delirium associated With substance-induced psychosis: A case report

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Abstract

Electroconvulsive therapy (ECT) is an effective treatment for various psychiatric conditions. Although rare, prolonged post-ECT delirium is a serious adverse effect of ECT. Various factors, such as underlying brain pathologies, medications, seizure duration, and type of electrode placements play a role in the development of post-ECT delirium. We report a 56-year-old male suffering from 14-day-long post-ECT delirium associated with substance misuse, pesticide exposure, as well as ischemic brain changes. On the basis of the insights from this case, it may be suggested that all patients should be screened for risk factors associated with ECT-related delirium before ECT and that various parameters, such as electrode placement and medications, should be adjusted accordingly.

KEYWORDS
electroconvulsive therapy, postictal delirium, prolonged post-ECT delirium

1 | INTRODUCTION

Delirium is one of the most well-known complications of electroconvulsive therapy (ECT). There are studies that report the incidence of post-ECT delirium to be as high as 12% (Jo et al., 2021). Various factors seem to play role in the development of post-ECT deliria, such as a history of cerebrovascular disease, catatonia, dementia, and increased seizure duration (Tsujii et al., 2019). Although delirium is mostly defined as a short-term or immediate adverse effect of ECT, there are various studies and case reports showing the persistence of delirium after more than 24 h after the last ECT session. Excepting a few case reports, the incidence of post-ECT delirium in one study was found to be 5.7% among 488 patients treated with ECT (Grover et al., 2020). There are also some reports that concern the treatment of prolonged post-ECT delirium. Although some studies show that delirium diminishes with supportive therapy and without any specific psychotropic medication, there are also studies suggesting the use of various medications in case of post-ECT delirium, including intravenous propofol, donepezil, benzodiazepines, and antipsychotics (Qiu et al., 2020). Interestingly a case report showed that use of donepezil before ECT sessions reduced the duration of post-ECT delirium (Takamiya et al., 2019). Moreover, researchers report that the use of brief pulse and dexmedetomidine may have preventive effects against post-ECT delirium (Tsujii et al., 2019). Nevertheless, it may be suggested that prolonged post-ECT delirium is not a well-defined phenomenon and that the literature contains limited data on the early detection and treatment of this serious condition.

2 | CASE PRESENTATION

A 56-year-old male was admitted to our outpatient clinic. He is married, has two children, and works as an agricultural engineer running his own store on agricultural pesticides. He had no history of psychiatric disorders or treatment before he was admitted to the clinic. His relatives reported that in the last 2 months the patient was speaking and behaving strangely. He suffers from decreased sleep, irritability, and grandiose delusions such as big agricultural projects to relieve his country from its debts or resurrecting a deceased friend. Moreover, he became violent and had a fight with his son. According to his relatives, he was always a daydreamer and avoided social contact. His social avoidance became significant in recent years and he started to live alone in his workshop. Accompanying this social isolation, the patient started to consume various psychoactive drugs,

mostly cannabis and methamphetamine, but also abused pregabalin. Both the patient and his relatives denied positive psychotic symptoms in this period, although his social isolation may be formulized as a pre-psychotic episode with negative symptoms. Further, he had significant contact with agricultural chemicals such as pesticides because he works as an agricultural engineer. As he has worked in the agricultural sector with different job titles the patient has been in contact with pesticides for more than 30 years. During the first psychiatric evaluation, thought incoherence, reference and grandiose delusions, loss of reality, and rejection of any treatment with loss of insight and judgment, psychomotor agitation, loss of appetite, and decreased sleep were prominent findings. Family history revealed two maternal uncles with a history of psychotic disorders, most probably schizophrenia. After the first psychiatric interview, the patient was hospitalized with a *DSM-5* diagnosis of substance-induced psychosis. As the patient last consumed psychoactive drugs more than 2 weeks ago, withdrawal syndrome was not considered as a primary diagnosis.

After admission to the inpatient clinic, electroencephalography (EEG) and cranial computed tomography (CT) examinations with a neurological consultation were carried out. Although there were minimal ischemic changes in CT, EEG, and neurological examination were not indicative of an organic etiology. Pharmacotherapy with antipsychotic medications was planned: olanzapine 10 mg oral and paliperidone 3 mg oral were prescribed. Due to incompliance to oral medication and loss of insight with ongoing psychotic symptoms, treatment was modified to paliperidone palmitate 100 mg and olanzapine 10 mg intramuscular. Benzodiazepines were also considered in treatment but, due to diagnostic ambiguity and risk of delirium associated with benzodiazepines in certain cases, treatment with antipsychotics continued. After 2 weeks of admission and treatment, the patient showed no sign of improvement. Although it is not considered as first-line therapy in substance-induced psychosis, due to severe agitation of the patient and consistent refusal of any medications, both oral and parenteral, ECT was planned with the consent of first-degree relatives. Moreover, the decision for ECT was also considered with the suggestions and requests of the legal conservator of the patient. In this regard, a written and oral consent was obtained from relatives before ECT and also from the patient himself after remission. The decision for ECT was based on primarily the refusal of the treatment, significant agitation and total lack of insight of the patient, and no signs of response to the proper doses of antipsychotics after 2 weeks. The patient consulted the anesthesiology and ECT experts in our clinic; no contraindications for ECT were specified. Antipsychotic treatment was modified as olanzapine 10 mg and ECT, scheduled as three sessions a week, was performed. The Somatics Thymatron System IV was used as the ECT device, which gives bipolar, brief pulse, square-wave stimulus. Propofol 100 mg and suxamethonium chloride 50 mg were administered as anesthesia protocol before every ECT session. The patient received bitemporal electroconvulsive shocks with a stimulus dose of between 30% and 35%. The duration of seizures varied between 40 and 78 s.

After the sixth session, thus after 2 weeks, it was observed that the patient suffered from disorientation and amnesia, and, therefore, ECT was stopped. Accompanied with psychotic symptoms, the manifestations of delirium continued in the following days. In suspect of an organic etiology, the antipsychotics were stopped, and the patient was consulted to internal medicine and neurology once again, with detailed blood tests including hemogram, inflammation markers and electrolytes, cranial CT, and EEG. Both CT and blood tests were unindicative for an organic etiology; nevertheless, EEG evaluation showed rhythmic-delta activity with bilateral synchronous slow waves. Upon these findings, a diffusion-weighted cranial magnetic resonance imaging (MRI) to exclude encephalitis was performed and the evaluation showed no pathologic findings besides ischemic changes already reported in cranial CTs. Nevertheless, valproate 500 mg was prescribed once daily according to a suggestion from neurology. After all these diagnostic procedures, the patient was treated as post-ECT delirium due to cognitive impairment caused by psychoactive substances and pesticides, to which the patient had been substantially exposed. Without any pharmacological interventions, the patient was treated with means of psychotherapeutic and behavioral approaches specifically targeting orientation and social interactions. With a slowly improving clinical picture, psychotic symptoms and loss of insight were gradually decreased and the patient was discharged, with paliperidone 100 mg depot and valproic acid 500 mg treatment, 14 days after his last ECT session and 42 days after his admission to inpatient clinic. The patient showed substantial improvements in means of insight in follow-ups, and his psychotic symptoms, disorientation, and memory impairments diminished significantly. Nevertheless follow-up cranial MRI scans revealed that ischemic pathologies have increased and the patient had a minor cerebrovascular accident with a temporary loss of motor function in the right arm, therefore, an antiplatelet treatment with clopidogrel 75 mg was prescribed by the neurologist. By the last control, the patient was free of psychotic symptoms under paliperidone depot 100 mg and showed no signs of impairments in social or professional functioning.

After the decision to submit this case as a scientific case presentation, both the patient and his relatives were informed about the processes, and they gave written and oral consents to publish the data. In accordance with legal regulations, no ethical committee approval was sought, as case reports are not one of the research types requiring approval by ethical committees in Turkey.

3 | DISCUSSION

Delirium after ECT is a well-known complication of this intervention and various factors are associated with the development or persistence of delirium. In most cases, delirium persists for a couple of hours and seldomly persists for more than 24 h (Palanca et al., 2018). Relatedly, studies point to a distinction between types of delirium after each ECT sessions or following a course of ECT sessions (Tsujii et al., 2019). The former type is referred to as postictal delirium and

the latter type as post-ECT course delirium. Given the low incidence of prolonged post-ECT delirium, there are limited data in the literature regarding its definition and management (Grover et al., 2020). Several reviews and studies specify various risk factors for post-ECT delirium; which are mainly catatonic features, impaired cholinergic function, increased seizure duration (more than 80 s), and bilateral type of electrode placement (Reti et al., 2014; Tsujii et al., 2019).

In our case, delirium persisted for about 14 days with accompanying psychotic symptoms. The prominent risk factor for our patient appears to be the impairment of cholinergic function in the brain, mostly due to exposure to psychoactive drugs and agricultural pesticides, as well as pre-existing cortical ischemic changes. Moreover, bilateral stimulation also seems to be a risk factor for the development of delirium in our patient. Therefore, it can be suggested that cranial MRI screening may be a valuable tool to detect underlying risk factors for post-ECT delirium and that it may be assessed as a routine examination for all patients before ECT. In this regard, the use of bilateral electrode placement must be considered critically, hence unilateral stimulation may be more convenient in patients with risk factors associated with post-ECT delirium.

Another important aspect, in this case, is the management of post-ECT delirium. Various studies and case reports suggest the use of different types of medications in post-ECT delirium, including benzodiazepines, antipsychotics, and cholinergic drugs such as donepezil (Takamiya et al., 2019). In our case, no specific psychopharmacologic medication was used, in consideration of the risk factors and adverse effects associated with such medications. Nevertheless, our patient became free of delirium in 14 days, and it may show that nonpharmacological interventions, such as behavioral approaches and settings with increased social interactions, may also improve the symptoms of post-ECT delirium.

In conclusion, we suggest that risk factors associated with post-ECT delirium should be assessed separately for each patient through means of personalized or precision medicine. Identifying the proper risk factors for post-ECT delirium may allow clinicians to adjust various parameters with aim of preventing delirium as a complication of ECT. In this case, this adjustment would be preferring unilateral electrode placement over bitemporal ECT, as the former is known with a decreased risk of cognitive side effects and delirium (Tsujii et al., 2019).

4 | IMPLICATIONS FOR PSYCHIATRIC NURSING PRACTICE

Prolonged post-ECT delirium is a relatively frequent and potentially dangerous side effect of highly effective treatment: ECT. Nevertheless, the risk factors associated with this condition are well defined in the literature and can therefore be controlled. The importance of the current case presentation in means of psychiatric nursing practice reveals itself in two dimensions: first, common risk factors for post-ECT delirium are mostly related to daily nursing practices, such as observing the disturbed cognitive functions of patients, monitoring psychiatric and nonpsychiatric medications, and symptoms of patients, such as catatonia; second, the current case points that apart from psychotropic medications, behavioral approaches and social interactions may play a role in the treatment of post-ECT delirium. Therefore, it may be crucial from the psychiatric nursing perspective to follow-up memory and overall cognitive functions of patients and implement relevant behavioral interventions and increase social interactions to help patients to regain their neurocognitive abilities. In this regard, it may be suggested that further training of frontline staff, such as psychiatric nurses, in these challenging cases, may improve the quality of psychiatric care and decrease ECT complications.

DATA AVAILABILITY STATEMENT

Data available on request from the authors

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