Progressive Prolonged Delirium After Electroconvulsive Therapy

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Electroconvulsive therapy (ECT) is a safe, effective, and underutilized treatment for multiple psychiatric conditions.[1] However, delirium is a common complication of ECT. Acute postictal delirium (<1 hour) has been reported in 18% of patients,[2] with a subgroup (5.7%) experiencing disorientation up to 24 hours after treatment.[3] In rare cases, delirium can be prolonged, lasting 3 days or more. We present one of the few reported cases of prolonged ECT-associated delirium, offering insights into the proposed pathophysiology.

Case Report

The patient is a 65-year-old white woman with a 9-year psychiatric history of major depressive disorder (MDD) and generalized anxiety disorder and a medical history of hypertension and early-onset Alzheimer dementia with behavioral disturbance. After developing severe MDD refractory to medication management, including adequate trials of fluoxetine, sertraline, aripiprazole, buspirone, and olanzapine, she was referred for ECT. At the time of treatment, the patient was taking sertraline 150 mg/day and olanzapine 2.5 mg nightly. While there was reported improvement in her mood after the first 3 unilateral ECT treatments, the following 3 resulted in escalating periods of acute, fluctuating mental status changes, resolving within a few hours. The fourth treatment resulted in an entire evening of fluctuating cognition, and after the fifth treatment, the patient was unable to recognize her husband for 2 days. There was no modification of ECT parameters or medications during treatment. Following an additional ECT treatment, the patient presented to the ED for escalating auditory and visual hallucinations over the previous 72 hours.

Electroencephalogram performed at this time was significant for moderate-to-severe diffuse background slowing. ECT was subsequently discontinued. During admission, the patient's medical workup, including urinalysis, comprehensive metabolic panel, thyroid-stimulating hormone, serum anti-NMDA antibody level, and head computed tomography, was unremarkable. It was concluded that the patient's delirium was secondary to her recent ECT, and she was treated with quetiapine 25 mg every 8 hours as needed for agitation. Her cognition and behavior improved to baseline over the next 5 days, totaling 8 days of delirium following her sixth and final ECT session.

Discussion

Prolonged delirium following ECT is rare. Five cases of prolonged delirium related to ECT (3+ days following ECT) have been reported (Table 1). These cases demonstrate a rare but consistent pattern wherein patients develop prolonged delirium after their third or fourth ECT treatment. In most cases, ECT was discontinued, although Khan et al[8] described successful unilateral treatment following recovery from delirium induced by bilateral ECT. Unlike other reported cases, the patient presented here continued to undergo ECT and subsequently continued to have escalating periods of delirium. This exacerbation may result from kindling, where repeated electrical or chemical insults can result in behavioral changes over time. This phenomenon was first described in 1998, when researchers noted that repeated episodes of alcohol withdrawal led to a persistent hyperexcitable state that caused behavioral dysregulation.[9]

Hypothetically, this phenomenon can extend to ECT, where hyperexcitability and hypersynchrony of brain activity may make patients susceptible to delirium with repeated treatments. Kindling provides a novel means of conceptualizing prolonged ECT delirium, especially in cases in which symptoms escalate with further treatment. Each subsequent event of central nervous system excitation could have further exacerbated the patient's hyperexcitable state. This case suggests that caution should be applied in prolonged postictal delirium and that continued ECT may further exacerbate this risk. Delirium is associated with a prolonged hospital stay, development or worsening of cognitive impairment, and increased mortality; therefore, it is critical to mitigate the risk for delirium.[10]

In cases of prolonged delirium following ECT, it may be necessary to space out treatments, modify medication regimens, or discontinue treatment altogether. Continued investigation into the link between ECT and prolonged delirium is essential in understanding risk factors for this complication and determining when it is appropriate to terminate an ECT course.

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Table 1.

A Summary of the Present Case and Previously Reported Cases of Prolonged Post-ECT Delirium

Case	Age (y), sex	Length of delirium	Prior psychiatric diagnoses	Substance use history	Psychiatric medications	Confounding factors	Intervention	Outcome
Present Case	65, female	8 d	MDD, GAD,	None reported	Sertraline 150 mg, olanzapine 2.5 mg nightly	History of early-onset Alzheimer dementia; short (<24 h) periods of delirium following first 4 treatments, with continuation of ECT resulting in prolonged delirium	Unilateral brief-pulse ECT, 6 total treatments	Resolution of delirium after 8 d, including 5 d of quetiapine treatment
Cheng,[4] 2021	43, male	1 wk	MDD, panic disorder	None reported	Paroxetine 20 mg (switched to duloxetine during admission), olanzapine 7.5 mg, diazepam 15 mg	Benzodiazepines stopped between treatments 2 and 3, patient developed delirium after sixth session; delirium responded to benzodiazepines	Right unilateral brief-pulse ECT, 6 total treatments	Resolution of delirium 2 wk after final ECT
Chopra and Sola,[5] 2010	74, male	Several months	MDD, anxiety	None reported	Olanzapine 2.5 mg, venlafaxine discontinued	Cognitive changes prior to ECT; short-term memory loss and inability to manage finances (thought to be related to worsening depression per authors); head CT with small vessel ischemic cerebrovascular disease with bilateral chronic basal ganglia infarcts	Right unilateral brief-pulse ECT, 3 total treatments	Partial resolution of delirium over 3 wk, treated with quetiapine; episodes of confusion continued for several months
Selvaraj and Praharaj,[6] 2012	50, male	1 wk	MDD	History of alcohol use disorder but abstinent for 5 y	Escitalopram 5 mg (increased to 20 mg), olanzapine 10 mg	Delayed onset of delirium (2 d after ECT) but no other obvious risk factors or causes for delirium	Bitemporal brief-pulse ECT, 6 total treatments	Resolution of delirium after 1 wk, treated with haloperidol, lorazepam, and donepezil
Köroğlu and Ayrıbaş,[7] 2022	56, male	2 wk	Substance-induced psychosis	History of THC, methamphetamine use, and pregabalin misuse; abstinent for 2 wk prior to ECT	Paliperidone 100 mg, olanzapine 10 mg	Patient had significant occupational contact with pesticides for 30 y; patient had previous ischemic changes revealed during delirium workup	Bitemporal ECT, 6 total treatments	Resolution of delirium after 2 wk
Khan et al,[8] 2018	68, male	2 wk	MDD, PTSD	None reported	None reported	Patient was not taking any psychiatric medications at the time of admission to the hospital	Bitemporal brief-pulse ECT, 5 total treatments; right unilateral ultra-brief pulse for 6–7 treatments	Resolution of delirium after 2 wk; patient had no delirium with unilateral ECT and achieved remission of his depressive episode

Abbreviations: CT = computed tomography, ECT = electroconvulsive therapy, GAD = generalized anxiety disorder, MDD = major depressive disorder, PTSD = posttraumatic stress disorder, THC = tetrahydrocannabinol.

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