

## Management of Prolonged Seizures During Electroconvulsive Therapy

Sir,

The authors present a case of a 26-year-old male who developed what they report as “status epilepticus” following ECT.<sup>[1]</sup> We suggest that he may have had a prolonged seizure instead, defined as a seizure lasting

longer than 3 minutes following the ECT stimulus. Prolonged seizures are more common in younger patients.<sup>[2]</sup> Early identification of prolonged seizures and treating them pre-emptively is a priority that the authors recognize,<sup>[1]</sup> as this can prevent further complications. We provide recommendations for the

management of this relatively routine complication of ECT, which occurs in approximately 2% of cases.<sup>[2]</sup>

While a prolonged seizure is defined as one that lasts 3 minutes, we feel that it is prudent to intervene at 2 minutes of seizure activity and rapidly terminate any motor or electroencephalographic (EEG) seizure activity detected at that point, rather than wait any longer. Appropriate intervention at this point may prevent progression to status epilepticus. Although past definitions of status epilepticus had specified 30 minutes of recurrent generalized convulsions without return of consciousness between episodes, more recent definitions suggest 5 minutes as the threshold for an operational definition.<sup>[3]</sup>

Simultaneous EEG monitoring is used in addition to EMG, allowing detection of both motor and EEG seizure activity, which may not be accompanied by any motor features. We typically terminate any seizure activity still occurring at two minutes, by using one-half the dose of the induction agent used (typically methohexital or propofol), as both are anti-convulsant and short-acting. In most cases, the EEG seizures end a few seconds after this, and the patient continues on EEG monitoring until full return of respiratory function and return of consciousness. EEG monitoring is necessary to detect non-convulsive seizure activity that may extend beyond the generalized tonic-clonic phase of the ECT-induced seizure. If EEG is not available, extra precautions should be taken to terminate any seizure activity at 120 seconds. In some cases, ictal activity may not be detectable by the two-lead bifronto-mastoid montage used, in the case of limbic seizures occurring in deeper structures.<sup>[4]</sup> Post-ictal agitation can be a sign of non-convulsive seizure activity, and the standard treatment of post-ictal agitation is with a short acting IV benzodiazepine such as midazolam (1-2 mg) or lorazepam (2-4 mg).<sup>[2]</sup> Diazepam 5-10 mg could be used as an alternative if other agents are not available. Close attention to airway management and prevention of hypoxia are important as the patient is stabilized. If still not possible to control the seizure, guidelines for ICU level care of intractable seizures should be followed.<sup>[5]</sup>

Patients who have a prolonged seizure should undergo a review of their medications and history to determine risk factors, which could be addressed, including electrolyte disturbances, history of known seizure disorder, traumatic brain injury, hypoxia, pregnancy, medications such as lithium, theophylline, tricyclics, trazodone, caffeine or withdrawal from anti-convulsants, benzodiazepines or alcohol.<sup>[6]</sup> Lithium doses are reduced during acute phase ECT, and the evening dose of lithium should be held prior to a continuation ECT session.

A recent case report highlights the risk of prolonged seizures in patients on lithium.<sup>[7]</sup>

In summary, we note two additional steps, which can be taken to reduce the risk of prolonged seizures in ECT — prompt termination of any seizure activity at 120 seconds post-stimulus, and using propofol as the choice induction agent in patients with risk factors for a prolonged seizure, (including younger age groups). Propofol has anti-convulsant properties and reduces seizure duration in ECT.<sup>[2]</sup> Patients who have experienced a prolonged seizure may be switched from other agents to propofol on subsequent treatments. Our hope is the safety of ECT worldwide will be improved with heightened vigilance for this preventable complication.


**Amy S. Aloysi, Ethan O. Bryson<sup>1</sup>,  
Charles H. Kellner**

Departments of Psychiatry and <sup>1</sup>Anesthesiology, Icahn School of Medicine at Mount Sinai, New York, USA

**Address for correspondence:** Dr. Amy S. Aloysi,  
Department of Psychiatry, Icahn School of Medicine at Mount Sinai,  
5 East 98<sup>th</sup> Street, 7<sup>th</sup> Floor Box 1139, New York - 10029,, USA.  
E-mail: amy.aloysi@mssm.edu

## REFERENCES

1. Omprakash TM, Chakrabarty AC, Surender P. Status epilepticus following electroconvulsive therapy. *Indian J Psychol Med* 2013;35:96-7.
2. Bailine SH, Petrides G, Doft M, Lui G. Indications for the use of propofol in electroconvulsive therapy. *J ECT* 2003;19:129-32.
3. Lowenstein DH. Status epilepticus: An overview of the clinical problem. *Epilepsia* 1999;40(Suppl 1):S3-8.
4. Thisayakorn P, Karim Y, Yamada T, McCormick LM. A case of atypical tardive seizure activity during an initial ECT titration series. *J ECT* 2013 [Epub ahead of print].
5. Costello DJ, Cole AJ. Treatment of acute seizures and status epilepticus. *J Intensive Care Med* 2007;22:319-47.
6. Crisancho MA, Alici Y, Augoustides JG, O'Reardon JP. Uncommon but serious complications associated with electroconvulsive therapy: Recognition and management for the clinician. *Curr Psychiatry Rep* 2008;10:474-80.
7. Sabagh DP, Bijan I, Longshore CT. Lithium and electroconvulsive therapy: A case report. *Psychiatric Annals* 2013;43:248-51.

Access this article online	
<b>Website:</b> www.ijpm.info	<b>Quick Response Code</b> 
<b>DOI:</b> 10.4103/0253-7176.131012	