

File: Unilateral ECT: Side effect

Postictal Excitement Following Bilateral and Right-Unilateral ECT

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Postictal excitement was observed in two patients following bilateral and/or right-unilateral ECT but not following left-unilateral ECT. The findings agree with reports associating a similar syndrome with right-side brain insult.

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Following seizure elicitation during ECT, a minority of patients manifest an acute confusional state, often referred to as postictal excitement or delirium (1, 2). The state is characterized by pronounced motor agitation and thrashing, clouding of consciousness, disorientation, and lack of response to commands. During the state, patients may injure themselves and may be assaultive. The syndrome first appears within a few minutes following a generalized seizure and may persist for 5 to 45 minutes. With recovery of orientation, patients are amnesic for the postictal excitement period.

There has been little discussion of this syndrome in the clinical or research literature, despite the fact that similar states may be observed with head trauma, cerebral infarct, intoxications, withdrawal states, infections, metabolic encephalopathies, and in the postictal period following epileptic seizures (3, 4). Mesulam and associates (4) reported three cases of acute confusional states following infarction of the right-middle cerebral artery. Levine and Finklestein (3) observed the syndrome in eight patients following right-postcentral stroke or trauma and the onset of clinical seizures. Both sets of investigators suggested that the syndrome is more likely to occur with right-side than with left-side brain damage.

Here we report two cases in which postictal excitement was observed following bilateral and/or right-unilateral ECT but was not observed following left-unilateral ECT in the same patients.

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CASE REPORTS

Case 1. Dr. A, a 41-year-old left-handed physician with bipolar II disorder according to the Research Diagnostic Criteria (RDC) (5), was hospitalized following a suicidal gesture. He met the RDC for major depressive disorder and had a history of five previous depressive episodes and two previous hospitalizations for depression. The current episode had been treated unsuccessfully over a six-month period with trials of various antidepressant medications at therapeutic blood levels. All medication was stopped several days before ECT sessions began. Routine laboratory values were within normal limits, and physical and neurologic examinations revealed no abnormalities.

As part of a research protocol, Dr. A was randomly assigned to receive right-unilateral ECT. Treatment was administered using the MECTA device, with titration procedures (6) to minimize the amount of anesthetic (methohexital) and muscle relaxant (succinylcholine) and ECT intensity levels. Five sessions of right-unilateral ECT were administered. Four minutes after the generalized seizure in the first treatment, Dr. A began to evidence postictal excitement. Motor restlessness developed into severe agitation accompanied by clouding of consciousness, disorientation, and lack of response to commands. The syndrome lasted 15 minutes. Full orientation (name, age, date, place, day of the week) did not return until 60 minutes after the treatment.

Postictal excitement also followed the next four treatments and was controlled with diazepam (15 mg i.v.) and/or methohexital (60 mg i.v.). Over the course of right-unilateral ECT, Dr. A's depressive disorder steadily improved, as evidenced by an 82% decrease in scores on the Hamilton depression scale. However, within four days of the last right-unilateral treatment Dr. A relapsed; within a week after this last treatment we began a course of left-unilateral ECT. Except for electrode placement, treatment procedures were identical. He showed no signs of postictal excitement during this course of eight treatments, and no posttreatment medication was administered. Full orientation occurred on average (\pm SD) 4.04 ± 1.46 minutes following the end of the seizure.

Dr. A did not show improvement in depressive symptoms, and left-unilateral ECT was abandoned in favor of bilateral ECT. Four such treatments were administered, with no change in procedures other than electrode placement. Following seizure elicitation, postictal excitement was evident to varying degrees on all four occasions. On two occasions the state was pronounced and medication was necessary. Dr. A showed strong clinical improvement during and immediately following the course of bilateral ECT, as evidenced by a 78% decrease in depression scores; there was a moderate return of depressive symptoms a week following treatment.

Case 2. Mr. B, a 19-year-old right-handed student with schizoaffective disorder, depressed type (according to the RDC), was hospitalized; he received a course of five right-unilateral ECT sessions, followed by a session of left-unilateral ECT. Treatment procedures were similar to those used in the first case but without titration of ECT intensity levels. Following each of the five right-unilateral treatments Mr. B displayed the full syndrome of postictal excitement. The severity and duration of the syndrome appeared to increase with each treatment. The treating facility in this case typically restrains patients physically to control postictal excitement without the use of medication. Following the fifth session, four individuals had to restrain Mr. B for more than 15 minutes. Full orientation did not return until 45 minutes after treatment. Our findings in the first case prompted us to use left-unilateral ECT for Mr. B's final treatment. There was no evidence of postictal excitement, and the patient was fully oriented within 5 minutes after the seizure ended. Over the course of treatment Mr. B's depressive symptoms lifted and he ceased to hallucinate.

DISCUSSION

These cases suggest that electrical stimulation applied to the right hemisphere at a level sufficient to elicit seizures can be associated with the occurrence of postictal excitement. Our suggestion that acute confusional states reflect disruption of primarily right-side regions concurs with reports (3, 4) that such states are more likely to be observed following right-side than left-side stroke and trauma. It would appear, therefore, that the pathogenesis of postictal excitement reflects disruption of well-lateralized processes.

Mesulam and associates (4) speculated that the primary dysfunction reflects right-hemispheric involvement in the control of selective attention. They did not offer suggestions about the nature of the pathophysiology. We speculate that, unlike patients who demonstrate the more typical postictal state of depressed neurometabolic activity (6-8), the minority of patients who manifest postictal excitement may be subject to paroxysmal, heightened neurometabolic activity following seizures. With unilateral ECT, the postictal pattern of decreased neurometabolic activity

appears more marked on the side of the brain ipsilateral to electrode placement (6, 8, 9). It is possible that in patients subject to postictal excitement, the high neurometabolic rate we postulate follows seizures may be greatest on the side ipsilateral to electrode placement. Lateralization in the processes that underlie postictal excitement and the asymmetric effects of unilateral ECT on neurometabolic rates together may account for why bilateral and right-unilateral ECT are associated with the syndrome and left-unilateral ECT is not.

The findings may also have practical implications. In at least some patients, postictal excitement may be avoided by the use of left-unilateral ECT. This possibility should be considered in relation to the therapeutic and other side effects of the ECT modalities (1, 6, 10).

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