

This case series highlights the value of ECT as an effective, timely critical therapy for severe mental disorders. Thorough benefit-risk assessment is always needed when deciding about frequency changes or discontinuation of ECT; things as they are, it seems to be no different in these overwhelmingly transformed times of COVID-19.

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Electroconvulsive Therapy Administered During the COVID-19 Pandemic

To the Editor:

Electroconvulsive therapy (ECT) has been the criterion standard treatment for patients with psychiatric disorders who have failed to respond to pharmacological therapy or those who are noncompliant with medication and/or suicidal.¹ The coronavirus disease 2019 (COVID-19) pandemic has disrupted mental health care all over the world since January 2020, and it has also affected the practice of ECT with guidelines being developed for the ECT procedure, ECT anesthesia, and ECT administration.² There has also been a reluctance to proceed with nonemergency ECT during the pandemic when it is otherwise indicated, and a number of patients in the middle of ECT courses were disrupted because of the onset of the pandemic.³ There has been a concern about the potential risk to patients from cross-contamination within ECT departments, risk to staff from aerosol-generating procedures during ECT, and the redeployment of ECT teams, all contributing to limiting patient's access to treatment.⁴

We work in a tertiary general hospital in Mumbai, India, and many patients who receive ECT in our center are elderly, have medical problems such as diabetes and hypertension, and come from diverse parts of Mumbai city where COVID-19 infection rates may vary. The patients coming to our center are from the lower strata of society; have poor oral hygiene, poor general self-care, and overcrowding in their houses; live in slum dwellings; and do not follow social distancing or hand sanitization as per the recommendations.

We present herewith details of patients receiving ECT during the lockdown period in Mumbai, that is, between March 23, 2020, and June 8, 2020 (both days inclusive). There were many patients wherein an ECT course had been started, and they would have suffered if the course was abandoned midway. The psychiatry resident doctors and consultants involved in ECT received training in precautions from the microbiology and anesthesia departments and thus felt confident to administer ECT under protection.

In all, 168 ECTs were administered to 33 patients during the lockdown period. There were 16 male and 17 female patients. Of the 168 ECTs administered, 112 treatments were given on an inpatient basis to a total of 23 patients, whereas the rest were administered the same on an outpatient basis. Of the 33 patients, 12 new patients started their ECT course during the lockdown, whereas the others were receiving ECT prior and continued their course into the lockdown. The number of ECTs given to single patient ranged from 1 to 14. Majority of the patients (n = 24 [74.7%]) suffered from schizophrenia, whereas others suffered from depression and bipolar disorder. The indications for ECT were suicidality, aggression, noncompliance with medication, and past favorable response to ECT. Of patients who were receiving ECT prior to the lockdown, 2 patients backed out of completing the ECT course, citing fear of contracting COVID infection. It is important to mention that none of the nursing staff, ECT staff, doctors, and patients developed COVID during the entire period.

A departmental decision was made to restrict the ECT staff down to only 4 ECT practitioners, 2 anesthetists who would remain unchanged, and 2 nursing staff and 3 ancillary male staff to reduce the number of staff for ECT. There was a dedicated staff and resident doctor who would have the role of screening new ECT patients and conducting COVID-19 screening, taking temperature prior to letting the patient into the ECT room. All relatives accompanying the patient had to wear a mask and remain with the patient post-ECT as well. The ECT room had a single entrance, and access of other staff to the ECT room was totally restricted. These changes required a serious and conscientious effort on the part of the staff and the resident doctors adjusted to all the changes. The department had a discussion on complete sanitization of the ECT room. The ECT room was sanitized at the start and end of the day's ECT. On average, 9 to 10 ECTs were given in a day. All ECT staff and doctors were requested to be vigilant of their movements so that they did not get in contact with

COVID-19 infection from external sources and then bring it back to the ECT room.

Elderly patients were taken first for ECT, followed by all inpatients and then lastly outpatients were taken up. Daily meetings before and after ECT sessions were held with all the staff involved to address any new issues that came up and also make new arrangements if needed. An entire separate team was kept standby to take over ECT even if one member of the current team developed infection. The teams were given a break of 1 week after 1 week of continuous duty. The staff of the microbiology department and internal medicine department had regular sessions with ECT staff on the usage, adherence to protocols, and proper disposal of personal protective equipment.

We administer on an average 10 to 20 ECTs a day, which reduced to 5 to 7 a day during the lockdown. Electroconvulsive therapy that would be routinely used in patients with psychiatric disorders was curtailed because of the restrictions imposed by the pandemic. We became strict in our choice of patients and offered ECTs only to those who needed it the most. It is also vital to mention that our center was the only public health hospital center with a fully functioning psychiatric department during the pandemic where all facilities continued uninterrupted, and we would even get referrals from other tertiary general hospitals and psychiatric centers that had shut during the pandemic. Thus, the referrals for ECTs in fact increased, and we had to strictly screen and decide that only the patients needing ECT the most received it.

We conclude that ECT is a safe and effective treatment and must be administered with due precautions when needed to patients even in situations such as the lockdown and pandemic facing us. There have been effective procedures for same that have been established and can be followed.⁵

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Response to Volume Increase in the Dentate Gyrus Induced by Electroconvulsive Therapy *Shedding Light on the Clinical Relevance of Plasticity in the Hippocampus*

Dear Sir:

The contribution of gray matter volume increase to the antidepressant effect of electroconvulsive therapy (ECT) is currently an area of debate in the field. In a recent Letter to the Editor of the Journal of ECT, Takamiya and colleagues¹ report replication of findings from an earlier study² in *Molecular Psychiatry* which reported a negative correlation between volume change in the right dentate gyrus (DG) of the hippocampus and change in Hamilton Depression Rating Scale (HAM-D) scores in ECT using the repeated measures correlation (rmcorr).³ Interestingly, this finding—a statistically significant negative correlation between HAM-D score and the right DG volume—was not detected using simple linear correlation between difference scores in a pre-ECT post-ECT design, but only emerged when the original data were reanalyzed using rmcorr.³ Based on these results, the authors conclude that rmcorr seems more suitable than a simple linear correlation of difference scores in a pre-ECT/post-ECT design with the benefits of rmcorr offering increased statistical power.¹ Here, we caution against such an interpretation by highlighting how the 2 methods test different hypotheses and why rmcorr is less suitable for investigating between subject differences in volume change over time in a pre-ECT post-ECT design.

First, Takamiya et al.'s initial simple linear correlation analysis⁴ tests between-subject differences, whereas the second analysis

tests within-subject differences.¹ Specifically, the first analysis examines whether subjects who show a larger (smaller) increase in volume of the right DG pre/post ECT also show a larger (smaller) decrease in HAM-D score pre-post ECT. The second analysis examines if a subject with a volume increase in the right DG at a particular moment in time also shows a decrease in HAM-D score at that particular moment in time (with the restriction that this within-subject association is the same in all subjects). Although it may seem counterintuitive, it is perfectly plausible for variables to have different relationships at different levels of analysis. Moreover, between subject and within subject relationships are mathematically independent and may measure or represent the operation of different processes. For example, empirical evidence has shown that an individual is more likely to experience a heart attack while exercising (ie, the within subject effect), but at the same time people who exercise more tend to have a lower risk of heart attack⁵ (ie, the between subject effect). Both the within-subject and between-subject findings are valid, and each has direct public health relevance.

Second, and related to our first argument, the rmcorr applied by Takamiya et al¹ used subject-related repeated measures of 2 variables (volume of the right DG and HAM-D) yet time was not included as a variable. This means the analysis precludes inference about changes in volumes of the right DG and HAM-D during the course of ECT treatment. The authors mention that in their initial analysis, they did not find a significant linear correlation between volume change in the right DG and change in the HAM-D scores,⁴ that is, in this analysis, they did not find a correlation between volume change over time during ECT and change in depression scores over time during ECT. However, contrary to this initial analysis, the rmcorr analysis applied afterward assessed the within subject correlation between the volume of the right DG and the HAM-D using repeated measurements within subjects. The relevance of this important distinction can easily be illustrated by using a simulated dataset where the volume of a given region of interest and a depressive symptom score are measured at 3 visits. When the 3 measurement occasions are randomized (the chronological order is alternated by changing the time label), the repeated-measures correlation remains the same while the volume change and the depression score change in time are alternated. This effect can be visualized in Figure 1, which illustrates how the within-subject relation remains the same while measurement occasions