

of illness. The extent to which changes in regional brain activity either vary over time or interact with structural changes (such as the postulated reduced volume of the hippocampus as a function of number or duration of depressive episodes) (Sheline et al 1999) is a particularly intriguing area for further study.

Dr. Videbech's 2002 publication and explicit dissection of the different subregions of the prefrontal cortex inversely related to psychomotor retardation and severity of depressive psychopathology positively related to activity in the hippocampus are noteworthy contributions to the field.

We thank Dr. Videbech for his thoughtful comments on our article and the related work on this topic.

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## Comment on "Repetitive Transcranial Magnetic Stimulation versus Electroconvulsive Therapy for Major Depression: Preliminary Results of a Randomized Trial"

To the Editor:

The article "Repetitive Transcranial Magnetic Stimulation versus Electroconvulsive Therapy for Major Depression: Preliminary Results of a Randomized Trial" by Janicak et al (*Biol Psychiatry* 2002;51:659-667) concludes: "A 2-4 week randomized, prospective trial comparing rTMS to ECT produced comparable therapeutic effects in severely depressed patients." The conclusion is not justified on two grounds.

The sample size of 22 patients yields unequal cohorts of 13 repetitive transcranial magnetic stimulation (rTMS) and 9 electroconvulsive therapy (ECT). Such cohort sizes are statistically inadequate to determine equivalence of treatments, and the conclusion represents a Type II statistical error.

The outcome rate of 64% for ECT is lower than that commonly established today (Abrams 1997). In the latest reports, the Consortium for Research in ECT (CORE) Group found an 84% remission rate for patients with nonpsychotic depression in a sample size of 253 patients treated with bitemporal ECT. The efficacy rate for patients with psychotic depression was 95% (O'Connor et al 2001; Petrides et al 2001). Such efficacy rates for bilateral ECT are not unusual and provide a better standard for assessing the merits of ECT in modern clinical practice. (The

CORE Group is the four-hospital consortium studying the efficacy of continuation ECT compared to continuation pharmacotherapy after ECT in patients with unipolar depression.)

The equivalence of rTMS to ECT in treating severely depressed patients is not demonstrated.

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patients with major depression to electroconvulsive therapy. *Am J Geriatr Psychiatry* 9:382–390.

Petrides G, Fink M, Husain MM, Knapp R, Rush AJ, Mueller M, et al (2001): ECT remission rates in psychotic versus non-psychotic depressed patients: A report from CORE. *J ECT* 17:244–253.

## Reply

Dr. Kellner and colleagues raise two important concerns. In terms of the sample size and the possibility of a Type II error, we agree that the comparative inference drawn from our data is subject to such a statistical problem, and the chance of this is larger than that expected from a confirmatory study. Throughout our article, however, we indicate that our present analysis primarily reinforces the need for such a larger sample trial (Janicak et al 2002). Further, our position supporting equivalence for rTMS and ECT is based on a summation of the evidence as described in the article, of which our data analysis is only one of several components. It was the support from this additional evidence that lead us to propose further investigation of our present conclusion.

We believe the CORE group has collected an impressive amount of data on ECT-induced response and remission rates for unipolar major depression (O'Connor et al 2001; Petrides et al 2001). In relationship to differences in the ECT-induced rates of remission between the CORE study and ours, two issues deserve further inspection. The first is a comparison of relevant demographic variables that may impact outcome. Table 1 indicates a number of important and potentially relevant differences. For example, our group was younger, had an earlier onset of illness, and more hospitalizations.

Table 1. Comparison of Relevant Demographic Variables

	Janicak et al <sup>a</sup> (ECT subjects only)	CORE Study <sup>b</sup>
Mean age (y) ( $\pm$ SD)	42.7 $\pm$ 14	56.2 $\pm$ 16.2
Male	65%	33%
Unipolar/bipolar	64%/36%	100%/0%
Psychotic/nonpsychotic	60%/40%	56%/44%
Age at first episode (y) ( $\pm$ SD)	25.4 $\pm$ 9	40.8 $\pm$ 19.7
Number of hospitalizations ( $\pm$ SD)	5.5 $\pm$ 7	2.4 $\pm$ 1.9
Baseline HDRS Criteria	21	21

ECT, electroconvulsive therapy; HDRS, Hamilton Depression Rating Scale.

<sup>a</sup>Data from Janicak et al (2002).

<sup>b</sup>Data from O'Connor et al (2001) and Petrides et al (2001).

Of note, the CORE group found the highest remission rates in the older age categories (i.e., about 90% in those  $\geq$ 46 years of age) and lower rates in the youngest age category (i.e., about 70% in those  $\leq$ 45 years of age). Using slightly different remission criteria than the O'Connor et al (2001) report (i.e.,  $\geq$ 50% reduction from baseline Hamilton Depression Rating Scale (HDRS) score and final score of  $\leq$ 8, versus  $\geq$ 60%

reduction from the baseline HDRS and a final score of  $\leq$ 10), we found a 56% remission rate in our sample with a mean age ( $\pm$ SD) of 42.73  $\pm$  14 years. Secondly, our sample was primarily comprised of drug-treatment resistant depression (TRD). This is relevant, given several reports that TRD has an ECT-induced remission rate more consistent with the results reported in our study (e.g., 63%–68%) (Prudic et al 1996; Sackeim et al 1993, 2000). Although the rates of remission are still slightly higher in these trials with TRD than our present study, this may be due to the more stringent criteria we employed for remission.

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