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Research report

Response to ECT in bipolar I, bipolar II and unipolar depression

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ABSTRACT

Objectives: A significant body of evidence indicates the efficacy of electroconvulsive therapy (ECT) in unipolar depression but mixed results have been reported in bipolar depression. We explored difference of response to ECT in unipolar (UP), bipolar I (BP I) and bipolar II (BP II) depression, in a sample of patients resistant to pharmacological treatment.
Methods: One hundred and thirty depressive patients (17 with Major Depression (UP), 67 with bipolar disorder II (BP II) and 46 with bipolar disorder I (BP I) according to DSM-IV criteria) were included in the study and treated with bilateral ECT, on a twice-a-week schedule. The patients were assessed before (baseline) and a week after the ECT course (final score), using the Hamilton Rating Scale for Depression (HAM-D), Young Mania Rating Scale (YMRS), Brief Psychiatric Rating Scale (BPRS) and the Clinical Global Improvement (CGI).
Results: The three groups (UP, BP II, BP I) showed a significant improvement after the ECT course. Global response rate (CGI<2) was 94.1% for UP, 79.1% for BP II and 67.4% for BP I. Concerning depressive symptomatology, the remission rate (HAM-D <8) was respectively 70.5 for UP, 56.7% for BP II and 65.3% for BP I. The best results were achieved by UP patients, while BP I group showed the worst results with a lower remission rate and higher scores in YMRS and BPRS psychotic cluster at the final evaluation.
Conclusion: ECT turns out to be a viable option for the treatment of both unipolar and bipolar depressive patients resistant to pharmacological treatment. Nevertheless, while the UP group showed the best response and clinical outcomes, the BP I patients tended to exhibit residual manic and psychotic symptomatology.

1. Introduction

Electroconvulsive therapy (ECT) is widely used for the management of severe and refractory depression (Daly et al., 2001; Grunhaus et al., 2002; Hallam et al., 2009), however, its utility in bipolar I and II disorder has not been extensively studied. This is particularly surprising, because a large body of evidence supports the existence of major differences in treatment response between unipolar (UP) and bipolar (BP) depression (Anderson et al., 2008). A recent study indicates that antidepressant add-on in bipolar depression is no more efficacious than optimized mood stabilizer monotherapy (Sachs et al., 2007). Moreover, treatment with antidepressants has been linked with manic switches, mixed state induction and, cycle acceleration (Altshuler et al., 1995; Ghaemi et al., 2003; Goldberg and Truman, 2003; Post et al., 2001).

Studies that have addressed the prognostic significance of the polarity of depression for ECT outcome were mostly retrospective analyses of case series and reached contradictory conclusions. Abrams and Taylor (1974), Avery and Winokur (1977) and Black et al. (1986) found out that ECT had equivalent efficacy in BP and UP depressive patients. Homan et al. (1982) reported that UP patients were more likely to show marked improvement than BP depressed patients. In contrast, among patients characterized as having depressive psychoses, Perris and d'Elia (1966) found that BP patients had a faster response rate and required fewer treatments than UP patients. Other studies showed similar levels of symptomatic and functional recovery (Daly et al., 2001; Grunhaus et al., 2002; Zornberg and Pope, 1993). On the contrary, Daly et al.

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(2001) have shown more rapid clinical improvement and fewer ECT treatments in BP than in UP patients. More recently, Hallam et al. (2009), in a large retrospective study on 106 consecutive inpatients, reported that in contrast to UP patients, where improvement was seen in all measures, in BP patients there was an absence of response in subjective measures, in spite of an improvement in clinician rated measures.

The aim of this study was to examine the response to ECT in patients with unipolar, bipolar I and II depression, in a sample of patients resistant to the pharmacological treatment. Based on the significant body of evidence indicating the efficacy of ECT in UP depression but mixed results in BP populations, it was hypothesized that UP patients may present better response to ECT in comparison with BP I and BP II patients.

2. Method

The study involved 130 consecutive patients with treatment resistant Major Depression, who received ECT between January 2006 and February 2008 in the Department of Psychiatry of the University of Pisa. Study subjects were at least 18 years old and met the criteria of the *Diagnostic and Statistical Manual of Mental Disorders,* fourth edition (DSM-IV), for a major depressive episode associated with major depressive disorder (MDD) ($N=17$; 13.1%), bipolar I ($N=46$; 35.4%) or bipolar II disorder ($N=67$; 51.5%). The diagnoses were made by 2 senior psychiatrists (P.M, G.B.C.) and were confirmed by the administration of M.I.N.I. (Mini International Neuropsychiatric Interview-Italian version 5.0.1; (Sheehan et al., 1998) according to DSM-IV criteria. All subjects gave their written informed consent to receive ECT and to participate in this study.

All patients were non-responders to pharmacological treatment. Treatment non-response in patients with recurrent major depression without psychotic symptoms was defined as failure to respond to two different adequate monotherapy trials of medication with different pharmacological profiles (e.g. a TCA at a dose equivalent to 200 mg of imipramine for at least 4 weeks and an SSRI a dose equivalent to 20 mg of fluoxetine for at least 4 weeks). For bipolar depression despite 2 trials of at least 8 weeks consisting of 1 trial with mood stabilizer(s) plus a TCA and 1 trial with mood stabilizer(s) plus an SSRI. In psychotic depression, an additional criterion was concomitant administration of an antipsychotic medication at the dose equivalent to at least 300 mg/die of chlorpromazine.

The patients were evaluated prior to ECT (baseline) and a week after the ECT course (final score), using the Hamilton Rating Scale for Depression (HAM-D) (Hamilton, 1960), Young Mania Rating Scale (YMRS) (Young et al., 1978) Brief Psychiatric Rating Scale (BPRS) (Ventura et al., 1993) and the Clinical Global Improvement (CGI) (Guy, 1976). The decision to terminate ECT sessions was made by the treating clinicians blinded to the diagnostic and symptomatological evaluation.

The HAM-D scores were used in two different ways for classification of response to ECT: *Response* was defined as a reduction in HAM-D score of at least 50% post-treatment compared to pre-treatment and *remission* was defined as a post-treatment HAMD scores <8 (Grunhaus et al., 2002). As concern CGI-Improvement subscale, *Response* was defined as a rating of 2 "much improved" or 1 "very much improved" and remission was defined as a rating of 1 "very much improved" at the end of the ECT course.

In the absence of a specific scale for psychotic symptoms, the change in psychotic symptomatology was approximated using BPRS psychosis cluster score: hostility, suspiciousness, hallucinations, unusual thought content and conceptual disorganization (item 6, 9, 10, 11 and 15-maximum score 35) (Bell et al., 1992).

2.1. ECT Procedure

Anesthesia was induced with intravenous thiopental (2–4 mg/kg) and succinylcholine (0.5–1 mg/kg). Bilateral ECT was delivered using a brief pulse stimulator Mecta 5000Q (Mecta Corporation, Lake Oswego, USA), on a twice-a-week schedule. The patients were ventilated with 100% oxygen until resumption of spontaneous respiration. Physiologic monitoring included pulse oximetry and an electrocardiogram. The stimulus setting were initially based on age (Petrides and Fink, 1996) and the length of the seizures measured by electroencephalogram (EEG) was kept above 25 s. If motor seizure duration fell below 25 s, the stimulus setting was raised (1.5 times) at the next session. The number of ECT trials was

Table 1
Demographic and clinical characteristics in unipolar, bipolar II and bipolar I depressive patients treated with ECT.

	Unipolar $N=17$	Bipolar II $N=67$	Bipolar I $N=46$	F or $\chi 2$ ($df=2$)	p
Age, mean (sd)	53.6 (17.2)	52.8 (14.3)	51.0 (11.8)	0.32	.73
Age at onset, mean (sd)	32.1 (13.2)	33.4 (15.8)	28.5 (11.7)	1.70	.19
Gender, females, *N* (%)	15 (88.2)	42 (62.7)	28 (60.9)	4.55	.07
Lenght of current episode, mean (sd)	8.6 (5.9)	8.5 (9.0)	7.1 (5.7)	0.50	.60
Total number of episodes, mean (sd)	5.5 (3.7)	5.2 (2.8)	6.7 (2.8)	3.58	.03*
Total number of hospitalizations, mean (sd)	4.2 (4.7)	4.6 (11.8)	4.4 (2.6)	0.13	.98
Total number of ECT, mean (sd)	6.5 (1.7)	7.2 (2.3)	7.4 (2.5)	0.95	.39
Lifetime comorbidity, *n* (%)					
Social phobia	0 (0.0)	1 (1.5)	0 (0.0)	0.95	.39
Panic disorder-agoraphobia	10 (58.8)	26 (38.8)	13 (28.3)	5.01	.08
Obsessive-Compulsive Disorder	1 (5.9)	7 (10.4)	6 (13.0)	0.68	.69
Alcohol abuse	0 (0.0)	2 (3.0)	1 (2.2)	0.54	.31
Drug abuse	1 (5.9)	2 (3.0)	0 (0.0)	2.19	.22

Notes:
* (Scheffe test BP I>UP,BP II).