

CLINICAL VARIABLES AS PREDICTORS OF RESPONSE TO ELECTROCONVULSIVE THERAPY IN ENDOGENOUS DEPRESSION

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ABSTRACT

There is lack of consensus on the clinical variables that predict response to ECT. Identification of clinical variables could help in predicting the type of response before the start of ECT. Therefore, a prospective study on 22 patients of severe depression, some of whom were drug-naive and others drug free at time of ECT, was undertaken. A maximum of six ECT were administered with a priori definition of 'good response' (60% or greater reduction in Hamilton Depression Rating Scale scores). Results showed that three clinical variables could distinguish between good responders and poor responders. Hence, response to ECT was associated with the duration of past depressive episodes, suicidal thoughts and somatic symptoms.

Key words : Depression, electroconvulsive therapy, clinical, predictors of response

Depression is one of the commonest diagnosis made in psychiatric practice, with electroconvulsive therapy (ECT) having a major role in its treatment. Use of ECT in depression has generally been advocated for presence of endogenous or melancholic features, stupor, suicidal risk, psychotic features, recurrent depression and resistance to pharmacotherapy (Khan et al, 1993). However, response to ECT is not uniform amongst depressives; the rates of response are generally in the 50% - 75% range (Black et al, 1993). Also, varying number of ECT treatments are required for response or recovery (Taylor, 1982). This variability in response has stimulated research for finding clinical variables with predictive value.

Initially, researchers worked on prognostic indices (Carney et al, 1965) of response to ECT. However, these fell out of repute due to methodological problems (Hamilton, 1982). Thereafter, research focussed on individual socio-clinical variables that could serve as predictors of response to ECT. There is lack of consensus on the predictive variables for good response to ECT

due to inconsistent associations or the possibility of chance associations due to numerous variables being studied at one time (Andrade, 1990). Generally, older age is associated with a good response (Andrade et al., 1988). As regards sex of the patient, some studies have found better response in females (Hamilton, 1982) though earlier studies had found no consistent relationship. Similarly, there appears to be no consensus on the variables of duration of illness, polarity of illness, severity of illness and presence of agitation as predictors of response. However research has continued in this area, with most reports emphasizing the importance of a melancholic-type disorder, the presence of psychotic phenomena, and/or the presence of psychomotor change (Andrade, 1990; Hickie et al., 1996).

However, within melancholics, attempts to predict ECT responders using psychopathological characteristics have yielded conflicting results (Andrade et al., 1988; Ancy et al., 1996). Additionally, a need has been felt to identify depressives who respond well or rapidly to ECT (Scott, 1989). Therefore, this study was

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planned to find out which clinical factors could indicate good response to a course of ECT.

MATERIAL AND METHOD

Sample : The study sample comprised a single group of 22 subjects with the ICD-10 (World Health Organization, 1992) diagnosis of current "severe depressive episode". For patients on antidepressant therapy before the start of inpatient treatment, a 5-day washout period was given (Extein et al., 1984). Patients with organic/physical illness, any other concomitant psychiatric illness, ECT in the previous 6 months and those who had any contraindication for the administration of ECT were excluded from the study.

Design of the study : The study had a prospective design with serial ratings of depression before and during the course of ECT.

ECT-Description and Schedule : The ECT machine was an electronic sine-wave that worked on 230 volts, 50 cycles AC mains with provision for 90-160 volts selection (by using a step-down transformer) and a timer with a relay to give timing selection from 0.1 to 1.1 seconds. There was, however, no facility for EEG monitoring in the ECT machine.

Patients were administered modified ECT three times a week i.e. on Mondays, Wednesdays and Saturdays at relatively fixed times between 9 a.m. and 10 a.m.. Anaesthesia was given by thiopentone sodium (150-300 mg) and succinylcholine (30-50 mg) was used as a muscle relaxant. All were premedicated with atropine and ventilated with 100% oxygen during induction and recovery after ECT. ECT was administered by one of the authors (NG) using standard bilateral fronto-temporal electrode placement. The initial stimulus was kept at 110 V for 0.6 seconds. During each ECT, voltage and duration parameters were noted. Seizure duration was measured by the 'cuff method' using two trained observers (Addersley & Hamilton, 1953). Occurrence of seizure duration i.e. presence of convulsions in the cuffed arm for at least 20 seconds was required for an adequate seizure (Andrade, 1993). If there was inadequate seizure response, then restimulation was done at

a higher voltage (raised by 10 V every time) and/or with greater time duration (increased by 0.1 seconds every time). This was required in only one patient on a regular basis.

No concurrent medicines, apart from benzodiazepines, were used during the inpatient stay. Benzodiazepines were administered whenever deemed necessary (e.g. for nighttime sedation), and a careful record was kept. Of the total subjects, three did not require these, whereas others needed them for nighttime sedation only. An average dose of 14.08 mg of diazepam equivalents was required for each patient during the course of ECT.

Assessment Instruments :

(a) Hamilton Depression Rating Scale (HDRS) was used for assessing the severity of depression (Hamilton, 1967).

(b) Brief Psychiatric Rating Scale (BPRS) originally developed by Overall and Gorham (1962) was used for assessing the presence of psychotic symptoms.

Operational Criteria : A maximum of 6 ECT were planned for each patient. The course of ECT was limited up to 6 as an endogenously depressed patient generally requires on an average of 6-8 ECT (Taylor, 1982). However, any patient who had a score of less than 8 on HDRS, as given by Bech et al. (1975) was deemed to have recovered and ECT was stopped.

Additionally, 'a priori' definition was kept for determining 'good response' to ECT. 60% or greater reduction in the intake HDRS score by the end of ECT course was defined as 'good response' (Sackeim et al, 1987).

Assessment : After obtaining informed consent from the patients and/or their relatives severity of depression was assessed on HDRS while presence of psychotic features was assessed on BPRS. All the ratings were done by the same rater (NG). These scales were administered one day prior to the commencement of the course of ECT and again about 30 hours after each ECT. This was done so as to avoid the effects of diurnal variation of mood and ECT related immediate side-effects influencing the assessments.

Statistical Analysis : Statistical analysis was

carried out on select socio-demographic, clinical and HDRS variables. For non-parametric variables, chi-square test a Fisher's exact probability test were applied. For parametric variables, student's t-test was applied. The level of significance was fixed at $p=0.01$ instead of $p=0.05$. As a large number of comparisons were made, this step was undertaken so as to minimise the chances of type I error without being unduly conservative (e.g. by using Bonferroni correction) (Altman, 1991).

RESULTS

The study was carried out over a period of 15 months. Of 35 patients screened on a consecutive basis, 10 did not fulfil the proposed diagnostic criteria while 3 patients did not give consent. The remaining 22 patients were included. Fourteen were antidepressant naive and eight were given the minimum required wash-out period. After completion of the prescribed course of ECT, the patients were

evaluated for the degree of response. Using the 'a priori' definition for 'good response', the sample was divided into 'good responders-GR' ($n=11$) and 'poor responders-PR' ($n=11$).

As regards socio-demographic variables, the age at presentation for treatment in both groups was comparable ($t=0.684$, $df=20$; NS). On applying non-parametric statistics, the two sub-groups were comparable on other socio-demographic variables (sex, marital status, education, occupation, income, family type, locality).

Clinical profile of both the sub-groups was then compared (table). On comparing the two sub-groups on the individual items of HDRS significant differences emerged for the items of 'suicide' and 'somatic symptoms' (table).

Also, there were 7 patients diagnosed as 'severe depression with psychotic features' who were additionally rated on BPRS at the time of intake. The mean BPRS score was 41.14 (6.22). Amongst these, one patient was a GR and six were PR. Due to the small number of

TABLE
DEMOGRAPHIC AND CLINICAL PROFILE IN 'GOOD RESPONDERS' (N=11)
AND 'POOR RESPONDERS' (N=11)

Parameters	Good responders	Poor responders	Level of significance*
Age (in years)	43.91±11.95	47.64±13.55	NS
Age at onset of affective disorder (in years)	30.00± 9.41	40.82±14.20	NS
Duration of index episode (in days)	145.82±93.84	385.55±364.66	NS
Presence of past h/o affective disorder #	9	4	NS
Bipolar depressives	2	1	
Recurrent depression	7	3	
Single depressive episode	2	7	
Average duration of past depressive episode (in months)	4.55±4.08	1.27±1.90	$p<0.01$
Presence of Psychotic features #	1	6	NS
Baseline HDRS Score	28.73±5.27	26.91±4.72	NS
Suicidal thoughts (HDRS)	2.18±0.98	1.00±0.89	$p<0.005$
Retardation (HDRS)	1.73±1.19	2.18±1.25	NS
Agitation (HDRS)	2.09±1.64	1.36±1.63	NS
Loss of appetite (HDRS)	1.73±0.47	1.18±0.60	$p<0.01$

* Based on student's t-test except those marked with #

Fisher's exact probability test

NS= Not Significant

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these cases and the inappropriate distribution amongst the GR and PR, further statistical analysis was not attempted for this scale.

Therefore, it was seen that GR had significant characteristics in comparison to PR : longer duration of past depressive episodes, greater severity of suicidal thoughts, and marked decrease in appetite.

DISCUSSION

This study was conducted on patients with endogenous depression; showing 'good response' in 50% of the sample. This is comparable to that seen in the study by Ancy et al.(1996) but less than the 75% good responders' rate reported by Andrade et al.(1988).

The present study indicates that certain variables are predictors of good response to ECT in depression. Individually, it was seen that both 'age at onset' and 'age at presentation' were not predictive, although age at presentation has been correlated as an independent factor with the final outcome; as in other reports (Rich et al.,1984; Andrade et al.,1989). This could be due to the use of RDC diagnostic criteria, presence of only non-psychotic depressives and different 'a priori' definition for good response used by Andrade et al.(1989). Psychotic features were found to be non-predictive as regards the response to ECT which has been earlier reported by Sobin et al.(1996) who found that ECT was a viable and effective treatment for RDC-major depression regardless of the presence or absence of psychosis, retardation and/or agitation. These findings are, however, in contrast to previous research (Andrade et al., 1988; Andrade, 1990; O'Leary et al.,1995).

Other variables like longer duration of past depressive episodes, greater severity of 'suicidal thoughts' and 'loss of appetite' (on item-wise analysis of the HDRS) could not be compared with work elsewhere. Variables of - duration of illness, polarity of illness, severity of illness, past history of affective disorder and presence of agitation and retardation were found to be non-predictive as regards response to ECT;

a finding previously reported by Ancy et al. (1996).

Certain differences were obtained between GR and PR (for the sample of endogenous depressives) which, to some extent, were comparable with previous research. It is important to mention that all previous findings could not be replicated. In fact, some studies have been unable to distinguish sub-groups of endogenous depressives with respect to response to ECT (O'Leary et al.,1995; Ancy et al.,1996). Therefore, the findings so obtained may be by chance and reflect the inconsistency across the search for predictive variables.

Certain limitations of this study viz. small sample size, lack of monitoring of ECT related parameters, and restricted number of ECT preclude definitive generalization of its results. However, it may be useful to evaluate the response to ECT of combined clinical and biological parameters of endogenous depression with methodologically sound procedures, so as to settle the current controversies.

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