The Effects of Regressive ECT with Process Schizophrenics

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An experimental group of 32 process schizophrenics was treated with regressive ECT, while a control group of 21 patients was treated with ataraxic drugs and psychotherapy. All patients were evaluated at admission and at or after discharge, using four sources of evaluation: self-ratings, psychological tests, relatives' ratings, and ratings by referring therapists. Statistical analysis of 55 variables indicated that the two groups were essentially equivalent at admission but showed significant differences on 28 of the 55 variables after discharge. All of the variables favored the experimental group treated with regressive ECT.

MAY (1) STUDIED 228 schizophrenics randomly assigned to five treatment groups. All were first admissions to a state hospital. He concluded that the administration of ataraxic drugs alone is generally the treatment of choice for the schizophrenic whose pretreatment prognosis is average or poorer. He also found that ECT is not a desirable alternative to drugs or drugs plus psychotherapy. The patients in May's ECT treatment group were treated by the conventional method. Unfortunately, studies using experimental variations of ECT have been limited, particularly as chemotherapy has gained wide use.

Regressive ECT is an experimental variation that employs more frequent treatments than is the case with conventional methods. It has been variously described as "intensive ECT" (2) and as "depatterning" when combined with sleep therapy (3, 4). Its effectiveness is not so much based on the increased frequency of treatments as on the occurrence of a "clinical" regression, which may occur after only a few treatments or may require many. The regression is marked by a state of helplessness, apathy, confusion, memory loss, speech alterations, and gross disorientation. Neurological signs of alteration in cerebral activity are evident near the end of treatment. Recovery from this state usually takes from seven to ten days. Improvement, if it occurs, is marked during this period.

Glueck, Reiss, and Bernard (5) reported the five-year follow-up of 100 patients treated by regressive ECT. They found that patients showed significant improvement, which often continued throughout the follow-up period; they could discern no serious medical complications or evidence of cerebral damage. Unfortunately, the reports concerning the effectiveness of regressive ECT have not been based on controlled investigation. For this reason, and in view of the encouraging observations on the use of this method at Stony Lodge Hospital, where the routine is to administer treatment twice daily seven days a week until regression occurs, it seemed important to conduct a controlled study to determine its merits.

The hypothesis underlying this research is that, given two groups essentially equivalent in demographic and psychological features, including severity of illness, a group treated by regressive ECT will improve as much as or more than a group treated with ataraxic drugs plus psychotherapy.

METHOD

It seemed essential to include only patients whose prognosis would ordinarily be judged as average or poorer. The criteria for "process" schizophrenia seemed most appropriate in this context (6). All patients included in the study had a poor premorbid history, chronic disorganization and detachment, and a long history of chaotic and unpredictable behavior. By no criterion applied would they be described as "reactive" schizophrenics nor would they carry a favorable prognosis.

A simple randomization design was planned but had to be abandoned because nearly half of the patients who met the selection criteria and were recommended by the admission board for regressive ECT could not be treated by this method because of the family's opposition or because physical conditions contraindicated its use. Since the hospital is not large (60 beds), it was decided to use patients recommended for but not receiving regressive ECT as controls, provided they met the criteria for process schizophrenia.

Four independent sources of evaluation were used to control for bias: 1) the patient himself, 2) two psychological tests, 3) the patient's referring therapist, and 4) the patient's closest available relative. None of the evaluators, including the patients, were aware of the purpose of the study. Further, to ensure naïveté, evaluations were collected for all patients entering the hospital between June 1970 and April 1971, even though more than half were not subjects in the study.

A total of 158 patients with various disorders were admitted during this period. Fifty-three of the 158 met the criteria for process schizophrenia and were also recom-

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mended for regressive ECT by the admission board.[1] Thirty-two of the 53 (11 men and 21 women) were treated by regressive ECT; they constituted the experimental group. The remaining 21 (11 men and ten women) were treated with drugs plus psychotherapy; they constituted the control group.

Patient evaluations were collected at admission and again at discharge or seven to nine weeks thereafter. At admission each patient completed the Katz Adjustment Scale Form S (KAS-S), which yields scores for six variables (7): symptoms, performance of and satisfaction with social behaviors, expectation of social activities, and performance of and satisfaction with free-time activities. We also administered the Minnesota Multiphasic Personality Inventory (MMPI) (8), from which 16 scales were analyzed,[2] and the Self-Focus Sentence Completion (SFSC), which provides four scores relating to egocentricity (9). An EEG was also taken.

At the same time, the closest available relative completed the Katz Adjustment Scale Form R (KAS-R), which provides 13 measures of symptoms and social behaviors along with five additional scores concerning the evaluation of, expectation for, and satisfaction with the patient's performance of social and free-time behaviors (7). KAS-R items are written in everyday language and can be used easily by the lay reporter.

The referring therapist completed an Inpatient Multidimensional Psychiatric Scale (IMPS), which was selected because of the ease with which it can be used by professionals after routine observation (10). It yields scores for ten factors ranging from excitation, hostility, and paranoia to cognitive, perceptual, and motor processes, as well as a composite score for schizophrenic disorganization.

At discharge the MMPI and SFSC were administered again and a second EEG was taken.[3] Seven to nine weeks after discharge the former patient again completed the KAS-S and the relative who had rated him at admission again completed the KAS-R. The referring therapist was contacted to determine whether the patient had returned to him for aftercare and, when this was the case, the therapist again completed an IMPS.

RESULTS

A statistical analysis of the demographic data showed no significant difference between the groups regarding age, marital status, education, length of hospitalization, number of individual and group therapy sessions, and incidence of prior hospitalization. The average patient in each group was in his 30s, had some college experience, had spent about 15 weeks in the hospital, and received about 25 individual and 21 group therapy sessions. About two-thirds of the patients in each group were married and about half had been previously hospitalized. The regressive ECT patients averaged 26.3 treatments, with a range of six to 58 treatments before "clinical" regression occurred.

The data from the four sources of evaluation—self-reports, psychological tests, relatives' reports, and therapists' reports—were each analyzed separately, using an analysis of variance for repeated measures; all analyses yielded f ratios that were statistically significant beyond $p < .01$. Subsequently, t tests were performed to further identify specific areas of significance in the data from each source. Both within-group and between-group analyses were performed. A total of 55 variables was studied.

Table 1 shows the frequency of statistically significant differences between the groups at admission and discharge or post discharge for each of the four sources of evaluation. It also includes the number of variables that changed significantly within each group from the first to the second evaluation. At admission, the groups differed on only four of the 55 variables, all from the relatives' reports. The regressive ECT group was rated as more confused and bizarre in behavior, while the control group was rated as more negative and functioning less satisfactorily in free-time behaviors. At discharge and post discharge the groups differed substantially. A statistically significant difference occurred between the groups for 28 of the 55 variables, all of which favored the ECT group. Further, the ECT group manifested significant change on 42 of the 55 variables (76 percent) from the first to the second evaluation, while the control group changed significantly on ten of the 55 variables (18 percent). It seems important to emphasize that significant changes occurred between the groups in the evaluations of all four sources.

Self-Reports

The groups were essentially the same at admission, but differed significantly on two variables after discharge. The ECT patients reported fewer symptoms and a more favorable performance of social behaviors. They were also more satisfied with this performance. The control group was essentially unchanged, except that they too were more satisfied with their performance of social behaviors. In an effort to clarify the self-reported data each former patient was asked to rate his post-discharge adjustment on a five-point scale. The results are shown in table 2.

Psychological Tests

At admission both groups showed very high SFSC scores for self-focus (egocentricity) and low scores in external world focus. At discharge the control group was essentially unchanged, except for giving fewer ambivalent

[1] In all, 77 of the 158 patients were recommended for regressive ECT by the admission board; however, 24 either did not meet the selection criteria for process schizophrenia or left the hospital against medical advice before treatment was initiated.

[2] The 16 scales analyzed from the MMPI were the three validity scales (lie, frequency, and correction), the nine clinical scales (hypochondriasis, depression, hysteria, psychopathy, masculinity-femininity, paranoia, psychasthenia, schizophrenia, and hypomania), and four nonclinical scales (social introversion-extroversion, ego strength, general maladjustment, and anxiety).

[3] EEGs were also taken from the regressive ECT group 12 to 15 days after their treatments were terminated.

TABLE 1
Summary of Statistically Significant Differences Within and Between Groups

Source	Number of Patients		Number of Variables	Significant Differences Between Groups		Number of Variables Significantly Changed	
	Experimental Group	Control Group		Admission	Discharge or Post Discharge	Experimental Group	Control Group
Self-reports	32	21					
KAS-S			6	0	2	3	1
Psychological tests	32	21					
MMPI			16	0	8	13	0
SFSC			4	0	3	3	1
Relatives' reports	27	18					
KAS-R			18	4*	7	13	4
Referring therapists' reports	22	15					
IMPS			11	0	8	10	4
Total			55	4	28**	42	10

*Two of these favored the experimental group and two favored the control group.
**All favored the experimental group.

responses. The ECT group showed a significant reduction in self-focus scores and a significant increase in external world focus scores, along with a corresponding reduction in ambivalent scores.

On the MMPI the groups were extremely similar at admission, manifesting pathologically high scores for eight of the 16 scales studied: depression, hypochondriasis, psychopathy, paranoia, psychasthenia, schizophrenia, hypomania, and general maladjustment. At discharge, the control group had not changed significantly, while the ECT group manifested significant change on 13 of the 16 scales and differed from the controls on eight of the scales, including seven of the nine basic clinical scales. At discharge none of the scores from the ECT group fell in the pathological range (8, 11).

Relatives' Reports

Though they differed only slightly at admission, the relatives' ratings differed markedly after discharge. The ECT group was rated as significantly less suspicious, anxious, and hyperactive and as showing fewer signs of general psychopathology than controls. The ECT group manifested significantly more stability and performed more favorably in both social and free-time activities. The post-discharge KAS-R report profiles were also compared, by group, with relatives' ratings of 133 day-care psychiatric patients, a second group of 51 discharged state hospital patients who showed no relapse after one year, and a third group of 450 nonpsychiatric subjects. The ECT group's profile generally fell between those of the day-care and nonrelapsed groups, while the control group's profile was very similar to that of the day-care sample.

Therapists' Reports

The evaluations of the referring therapists were the smallest in number of the four sources of evaluation. Not all patients in either group were rated by referring therapists and not all returned to the referring therapist for aftercare. The data derived from these evaluations were consistent with the data obtained from the other sources. At admission the groups did not differ on any of the 11 variables on the IMPS. After discharge, the groups differed significantly on eight of the 11, all of which favored the ECT group. The control group scored significantly higher in excitation, paranoia, perceptual disorganization, retardation, and motor disorganization, and showed increased hostility, grandiosity, and cognitive disorganization. In effect, the referring therapists rated the control group after discharge as essentially unchanged or worse.

EEG Evaluations

One of two consulting neurologists reviewed the admission and discharge EEGs. The neurologists also did blind ratings of EEGs of the ECT group taken 12 to 15 days after treatment was terminated. They judged all 53 admission and discharge protocols to be within normal limits. They noted abnormal alterations in delta activity in the EEGs of the ECT group taken shortly after treatment.

TABLE 2
Patients' Ratings of Their Adjustment After Discharge

Adjustment	Experimental Group	Control Group
Improved considerably	14	4
Improved slightly	11	6
Unchanged	5	3
Slightly worse than before	1	5
Considerably worse than before	1	3

DISCUSSION

The data presented appear to confirm the basic hypothesis of the study, that is, that the group treated by regressive ECT would improve as much as or more than the group treated by drugs plus psychotherapy. Both groups showed improvement, but the ECT group apparently showed the greater gains. The discharge and post-discharge evaluations showed the ECT group had relatively inconsequential symptomatology or behaviors commonly associated with severe disturbance.

Close examination of the results provides some clues about the symptomatic and behavioral differences between the groups at and after discharge. The discharge evaluation was derived from two psychological tests. On one, the SFSC, the ECT patients were considerably less egocentric and considerably more outer-world-oriented, while the control group remained highly self-centered. On the second test, the MMPI, the ECT patients showed profiles that were essentially free of the high T scores commonly associated with severe disturbance, while the profiles of the controls remained generally high for hypochondriasis, paranoia, hysteria, and hypomania and particularly high for depression. These data can be interpreted to suggest that, at discharge, the ECT patients were more concerned with affective control and social competency, whereas the control group were angrier and more preoccupied with themselves, especially with their health, and had become more interpersonally distant, with fewer affective controls.

The evaluations from the three sources taken seven to nine weeks after discharge appear to support this interpretation. The self-reports indicated that ECT patients had fewer symptoms and were performing more social behaviors. The relatives' reports, which are possibly the least amenable to the influence of any bias, described patients in the regressive ECT group as having fewer symptoms, being less anxious, and using free time more effectively. Conversely, the controls were rated as more suspicious, less stable, and more anxious than desired, and as functioning less effectively in social and free-time behaviors. The evaluations of the referring therapists provide added confirmation. They rated the ECT patients as substantially improved on nearly all of the variables measured by the IMPS. The controls however, while improving moderately for some variables, showed a paradoxical increase in hostility, motor disorganization, and cognitive dysfunction.

On the basis of these findings it seems reasonable to speculate that the major behavioral differences between the two groups at and after discharge occurred in two broad areas: social interaction and control of affect, especially negative affect. All sources of evaluation, including the patients themselves, reported that the controls, as a group, did not make the more socially desired responses to the same extent as did the ECT patients. They were apparently still uneasy in interpersonal situations, possibly as a function of their concern with their health. That phenomenon may have generated the perceived symptoms of paranoia, irritability, and anger or depression. The regressive ECT patients appeared to have somehow learned to cope more effectively with their emotions. They interacted in social situations in a less anxious, more profitable manner. It would be unrealistic to suggest that they are completely "normal" but the data do support the contention that they are considerably different from other groups of schizophrenics and more similar to non-psychiatric groups.

It is impractical to speculate about the causes for these changes since there are few "hard" data on ECT. Cameron (3) has suggested that the amnesic effect is crucial to improvement. Ottosson, among others, has indicated that producing a convulsion is necessary to obtain the desired effect (12). Obviously, the frequency of occurrence of convulsions in regressive ECT plays some role. Kalinowsky (13) has summarized the problem of understanding ECT quite well with his reminder that no theory of ECT has been developed that is sufficiently comprehensive to be taken seriously.

Finally, there are some important cautions that should be included here. The first concerns the experimental design of our study. Pure randomization was not used. The controls, although they met the selection criteria and were recommended for regressive ECT, were not selected randomly but by such factors as the family's unwillingness to approve ECT or, in a few instances, precluding physical factors. Thus, even though the two groups appeared to be highly similar at admission, it is possible that they were somehow different. We hope that the use of external evaluations by naïve evaluators provided an adequate control for this flaw. Secondly, it is difficult to identify the extent to which treatment afforded the control group truly approximated the model used by May (1). In this context it is important to emphasize that the patients were all treated in the same environment thereby limiting the extent to which findings might be generalized. Lastly, but possibly most importantly, the period of follow-up was not very long. While the results two months after discharge were encouraging, data from at least one year after discharge would be more reassuring. A study to obtain such data is currently under way and only after those data have been analyzed can more definitive statements be made concerning the effects of regressive ECT with schizophrenics.

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Questions of the Month

For each of the incomplete statements or questions below, ONE or MORE of the completions or answers given is correct. Choose:

A if only *1, 2, and 3* are correct,
B if only *1 and 3* are correct,
C if only *2 and 4* are correct,
D if only *4* is correct,
E if *all* are correct.

Question 1

A psychiatric disorder is likely to be associated with which of the following?
(1) Systemic lupus erythematosis
(2) Acute intermittent porphyria
(3) Carcinoma of the pancreas
(4) Huntington's chorea

Question 2

Genetic disorders due to abnormal carbohydrate metabolism include
(1) amaurotic idiocy.
(2) gargoylism.
(3) xanthomatosis.
(4) galactosemia.

(The Questions of the Month are from the Self-Assessment Program of the APA. The answers are supplied on page 277 of this issue.)