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Regressive Convulsive Therapy and Lobotomy in the Treatment of Mental Disorders

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This report deals with 267 cases of schizophrenia given various degrees of regressive and non-regressive electroshock therapy (EST) from 1946 to 1960. Of these, 19 ultimately came to lobotomy and are included in that group (Table III). In addition, there were 20 non-schizophrenic patients who were lobotomized by the Grantham technic after insulin or electroshock therapy had failed. One schizophrenic was lobotomized without previous EST. Only cases of schizophrenia were selected for the regressive EST study because of their well-known refractoriness to all kinds of therapy.

It may be significant that these 267 schizophrenics, picked out of approximately 1200 cases of all types given EST, were from private practice. Thus there has been a gradual evolution of my thinking with increasing confidence in the use of deliberate regressive EST. In a large institution one can select a "block" of cases on which to do a deliberate experiment in the field of regressive EST or of chemotherapy. Since the cases presented here are all private cases certain problems and limitations arise; for example, (1) pleasing the relatives and allaying their anxieties, (2) discontinuation of the treatment due to fear of it, (3) limitation of finances which might cause them to seek discharge from the hospital or transfer to a state hospital, (4) inability to follow them up for as long as one would wish. After the patient becomes symptom free through EST, he returns home and goes through the various phases of rehabilitation with adjustment to the home, to the community and finally to the work environment. He may be soon lost track of because he does not wish to incur additional expense when he is feeling well. Thus in private practice we are in a position which requires that we must assume the patient is doing well unless he returns for further therapy.

The clinical material showed a male to female relationship of 1-1.4; average age was 36 years with a range of 14 to 68 years; the average number of EST's was 42 ranging from 8 to 370. The 370 treatments were given over many years with frequent intervals of observation and office therapy.

The patient was prepared for treatment by the intravenous injection of 0.25 g. of Sodium Pentothal and 1 mg. of atropine, followed in another syringe by 10 mg. succinylcholine chloride (Anectine). Bitemporal electrodes were applied and the patient was given 2 to 4 grand mal convulsions by alternating current at two minute intervals, daily, six days a week. Rarely he would receive 5 to 6 convulsions daily for a short period to overcome anxiety or disturbing symptoms. Toward the end of the course the convulsions were reduced to one daily, then every other day.

The results were classified as "improved" when the patient was symptom free and returned to his former socio-economic status or when he retained residual symptoms but was not disabled for limited social or economic activity. They were classed as "poor" when there was no improvement.

It was found desirable to divide these cases into three chronological periods of treatment:

(1) *From 1946 to 1952* regression was inadvertent or accidental. This could be described as the period in which *mild* regression was used. Even then I found that in 82 cases, 71% of 17 cases improved when regressed, whereas 49% of 65 non-regressed patients showed poor results (Table I).

This seemed to indicate that regression, even though inadvertent, represented a faforable factor and that lack of regression was a poor prognostic sign. When it became

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evident that more than 50% of these schizophrenics did not get well when subjected to mild or orthodox EST, there began a trend toward more intensive treatment using two or occasionally three convulsions daily.

At this time the question arose as to whether brain damage was incurred by this method. Therefore a series of 125 consecutive cases were subjected to spinal fluid examinations before and after treatment. In those requiring a long course of treatment the spinal fluid was checked during its course. In no case was any deviation from normal found. This also applied to blood pressure, complete blood count, fasting blood sugar and urea nitrogen. Many elevated blood pressures returned to normal during treatment only to rise again when treatment was stopped. Occasionally there was a mild fever of 100°-101°F. Isolated spikes caused no concern but if the elevation persisted, EST would be stopped while a search for upper respiratory infection, pulmonary or genito-urinary pathology was made. If no pathology could be demonstrated, EST was resumed after the temperature remained normal for 48 hours.

TABLE I

Schizophrenics Treated with Regressive EST

		Regressed		Non-Regressed	
		Improved	Poor	Improved	Poor
1946-1952 *Types*					
Paranoid	(52)	8	3	20	21
Catatonic	(14)	2	1	7	4
Affective	(4)	0	0	2	2
Simple	(4)	1	1	2	0
Miscellaneous	(8)	1	0	2	5
	82	12	5	33	32
		71%	19%	51%	49%
1952-1955					
Paranoid	(35)	7	0	13	15
Catatonic	(2)	0	0	0	2
Affective	(3)	1	0	2	0
Simple	(1)	0	0	1	0
Miscellaneous	(4)	0	0	2	2
	45	8	0	18	19
		100%	0%	50%	50%
1956-1960					
Paranoid	(69)	34	5	19	11
Catatonic	(18)	6	0	8	4
Affective	(16)	10	0	3	3
Simple	(7)	4	0	2	1
Miscellaneous	(11)	6	0	4	1
	121	60	5	36	20
		92%	8%	64%	36%

(2) *In the period from 1952-1956,* which might be called a transitional period in my trend toward deliberate regressive EST for schizophrenics, it was found that in 45 cases, 100% of eight cases improved when regressed, whereas 50% of 37 non-regressed patients obtained poor results (Table I). This appeared to be still more confirmatory evidence in favor of intensive EST for schizophrenic patients.

(3) *From 1956-1960,* therefore, I deliberately attempted to regress *all* schizophrenics. In this group of 121 cases, subjected to regressive EST 92% of 65 cases improved when regressed and 36% of 56 cases obtained poor results when they failed to regress (Table I). By this time I was using mostly three or four convulsions daily at two minute intervals. The totals of these three chronological periods are summarized in Table II.

After failure of regressive EST 19 additional cases were lobotomized by the Grantham technic (Table III).

Thus, in the total series of 267 schizophrenic patients, 84% of 95 cases improved when they regressed and 49% of 172 cases had poor results when they did not regress (Table IV). This indicates that regression in the treatment of schizophrenia is of value and that failure to regress during EST is a poor prognostic sign.

This matter of regressive EST is not new. In 1948 Kennedy and Anshell[1] reported on a number of patients whom they regressed to the infantile state and 66% of these went into remission. They concluded that regression was beneficial.

Cerletti[2] in August 1950 reported that multiple EST's seemed to have a good influence in obsessive states, psychogenic depressions and even in some paranoid cases. He labeled this type of therapy "annihilation technic." This annihilation syndrome has been compared by Cerquetelli and Catallano with

the psychopathology following prefrontal lobotomy. They felt that there was a close parallel, with the advantage of reversibility in case of shock. Cerletti for the first time remarked on the emergence of anxiety during EST.

Garrett and Mockbee[3] in 1952 treated a series of 30 patients with 30 controls by regressive therapy. They reduced them to an "organic syndrome" but found that on emergence from this there were no ill effects from intensive regressive electroshock. Observations by electroencephalography revealed little change except for high voltage and slow dysrhythmia, most prominent in the anterior part of the brain, which lasted about 14 days after the termination of shock. The rhythm then became fairly normal. Some irregularity was noted for two or three months after the termination of treatment.

By 1957 many investigators were seriously engaging in the study of regressive EST. Among them were Glueck, Reiss and Bernard[4] who reported on a series of 100 cases. 67% of whom were schizophrenics with previous adequate courses of EST and/or insulin coma therapy without lasting improvement; 33% had had no treatment.

Glueck remarked that many of the investigators who were unsure of the margin of safety were restricted by the fear of inducing irreparable organic damage; thus they limited the number of treatments even though many patients were not completely regressed according to later standards. He felt that results in this group might have been improved if they had used more intensive therapy. Glueck described the effects of regressive shock therapy along both mental and neurological lines. He noted especially that at times a small number reached a plateau where, with continued EST, instead of regressing, they became more alert in spite of continued treatment. Calloway and Boucher[5] in 1950 concluded, in their EEG studies on a series of cases intensively treated, that EST produced no more permanent EEG changes than orthodox EST. Glueck confirmed these findings. He felt that regressive electroshock therapy proved its merit in chronic schizophrenics refractory to previous adequate courses of EST and/or insulin. He believed regressive shock therapy should be tried as the treatment of choice when hospitalization was necessary in schizophrenics. Since it does not result in cerebral impairment and final results are far superior to standard forms of EST, Glueck felt it should supplant the standard form even in patients who seemingly had a good

TABLE II

Schizophrenics Treated with Regressive EST

1946-1960

			Regressed		Non-Regressed	
Types			Improved	Poor	Improved	Poor
Paranoid		156	49	8	52	47
Catatonic		34	8	1	15	10
Schizo-Affective		23	11	0	7	5
Simple		12	5	1	5	1
Miscellaneous		23				
Pseudo-Neurotic	(8)		1	0	4	3
Chr. Undiff.	(6)		3	0	2	1
Hebephrenic	(5)		1	0	0	4
Over-Ideational	(3)		1	0	2	0
Post-Traumatic	(1)		1	0	0	0
		248	80	10	87	71
			89%	11%	55%	45%

TABLE III

EST Effects on Pre-Lobotomized Schizophrenics

		Regressed		Non-Regressed	
Types		Improved	Poor	Improved	Poor
Paranoid	(10)	0	3	0	7
Catatonic	(2)	0	1	0	1
Schizo-Affective	(6)	0	1	0	5
Pseudo-Neurotic	(1)	0	0	0	1
	19	0	5	0	14
		0%	100%	0%	100%

TABLE IV

Total Schizophrenics

	Regressed		Non-Regressed	
	Improved	Poor	Improved	Poor
267	80 (84%)	15 (16%)	88 (51%)	84 (49%)

prognosis as they only too often would relapse in a few months. Regressive electroshock therapy should be given before any patient is subjected to psychosurgery.

In August 1958 Moore[6] reported that regressive electroshock therapy was helpful in many cases of schizophrenia. His theory was that if sufficient EST was given so that the patient remained in a state of confusion for a lengthy period, then the "rest" from delusions and hallucinations might assist in recovery. It was an attempt to achieve a principle frequently used in the treatment of organic disease of the body, i.e. putting the diseased or injured parts at rest.

Cameron and Pande[7] reported on a new method of treatment of chronic paranoid schizophrenics in 1958. Their treatment consisted of prolonged sleep lasting 30 to 60 days combined with intensive EST. Sleep was produced by means of chlorpromazine, secobarbital, pentobarbital or phenobarbital, associated with EST given once daily or as many as four or five shocks within two or three minutes. The rate of administration of EST was set so that complete "depatterning" was achieved somewhere between the 30th and 60th day of sleep, usually after about 30 EST's. Thereafter, the amount of sleep-producing medication was gradually reduced as was the administration of EST. The period of rehabilitation following this type of treatment paralleled my own. These authors found chemical and physical therapies to be the only satisfactory means of halting the schizophrenic process. The objectives of intensive physical and chemical therapy were: (1) to bring the schizophrenic process to an end and (2) to break up completely, through the process of "depatterning," the ongoing structure of the abnormal behavioral patterns of the individual. This is similar to regressive EST.

It has become apparent in the past decade that the patient must pass through certain phases during EST in order to have the best chance of regaining a clinical status of normality.

The first phase noted was the remission phase. It was found during the first six or eight treatments in the average case that the patient lost the symptoms of which he complained on admission to the hospital. In prior years it was customary to dismiss the pa-

TABLE V
Results of Lobotomics

1954-1960			Immediate		Average	Final Results	
SCHIZOPHRENICS		(20)	Improved	Poor	Follow-up Time	Improved	Poor
Paranoid	(11)		10	1	All	10	1 d. 4 yr.
Catatonic	(2)		2	0	Schiz.	2	0
Affective	(6)		6	0	29 months	5	1
Pseudo-Neurotic	(1)		0	1		0	1
		20	18 (90%)	2 (10%)		17 (85%)	3 (15%)
NON-SCHIZOPHRENICS	(20)						
Manic-Depressive Psychosis	(5)		4	1	40 months	4	1
Invol. Psychosis	(6)		6	0	18 months	4	(2 Died)
Depr. Reaction	(2)		2	0	8 months	2	0
Psychoneuroses	(7)						
Phobic Reactions		(3)	3	0	All Psych.	3	0
Obsess.-Comp. N.		(3)	3	0	43 months	3	0
Conv. Hysteria		(1)	1	0		0	1
Total		20	19 (95%)	1 (5%)		16 (80%)	4 (20%)
		(40)	37 (93%)	3 (7%)	28 months average follow-up	33 (83%)	7 (17%)

tient from the hospital at this time thinking he was well. Too many recurrences appeared so that it was eventually decided this was only a preliminary phase. In this remission phase the patient unconsciously indicated that he would be willing to relinquish his psychotic symptoms and behave as an adult if the doctor would only stop the treatments.

It soon became evident that there was a *secondary phase called the anxiety phase.* In this, as the original symptoms disappeared, anxiety appeared. This took many forms, such as the patient pleading to go home, or finding excuses why he should go home with negative attitudes toward the treatment. This might progress all the way to violent resistance to taking the treatment. Many times the paient would frankly admit a fear of EST. In this phase we apparently mobilized the patient's unconscious anxieties which were at the basis of his psychosis. These anxieties would then "boil up" to the surface and become evident. This phase could be shortened by increasing the intensity of the treatment, i.e. by giving multiple EST's daily.

There is considerable overlapping of these various phases. The remission phase might continue throughout the entire treatment course, i.e. the patient would not get rid of his original symptoms. When this occurred it was a poor prognostic indicator. There might be multiple anxiety phases: primary, secondary or tertiary. The regression phase might be replaced by a reanimation phase with later regression.

As an overlapping phenomenon to the anxiety phase, however, *regression would routinely occur.* The patient would become progressively retarded, less communicative with others and would develop amnesia. With daily therapy this would continue until the patient was in an infantile state, unable to care for himself, requiring total care for feeding, bathing, clothing and bedding. He not infrequently would become incontinent of urine and feces. In this phase it seemed as if we returned him to an infantile state psychologically. This phase is usually quite prolonged. It took many years to realize that the patient would eventually emerge into a reanimation phase.

In the reanimation phase the patient would again begin to take an interest in his environment, feeding himself, taking care of his toilet and generally growing up. When these clinical phenomena appeared electroshock was diminished, tapered off and terminated.

The next phase is the reintegration phase. After EST was stopped the patient rapidly "grew up" from the infantile through the adolescent to the mature adult, resuming self care and regaining orientation. He regained contact with his environment, talked more and eventually lost his amnesia and confusion.

He then passed into a rehabilitation phase. When the above clinical phenomena appeared it was obvious that the patient had overcome his "psychological death." Seven to 10 days after termination of treatment the patient usually had regained his orientation; the confusion had disappeared and he was able to communicate, engage in occupational and and social therapy and take care of himself in a normal way. If reorientation did not occur or if confusion persisted with amnesia or with any of his former symptoms, it was obvious the treatment had not been successful. This was an indication for resumption of treatment.

In a successful case the patient would leave behind all his psychotic symptoms, the affect having been gradually "chipped off" from the psychotic constellation and externalized. After personal orientation occurred there was acceptance of those about him with social reorientation. Subsequently, there would occur adjustment of the individual to the hospital environment, to the home environment, then to the community environment and finally to his former employment.

Thus it can be seen that the primary anxiety phase must be considered as only one phase through which the individual goes in order to regain emotional stability and freedom from his psychotic symptoms.

Passing through these phases does not necessarily lead to a cure. Schizophrenia is such a complex disease with so many etiologic factors that no one method of treat-

ment can be certain to effect a cure. Nevertheless, regression therapy, followed through the various phases, seems to offer the best results so far.

Comment

It has been observed that many cases would first regress, then regain their symptoms, but then the symptoms might be of a different type; for example, an original paranoid schizophrenic might regress and then reanimate and develop catatonic symptoms to the point of catalepsy. This would indicate that the underlying disease was still present. When such a condition occurred it was a sign to the operator that the prognosis was poor and that the patient might not eventually regain a normal clinical status. Many of these cases, reviewed in retrospect, suggest that the patients should have had much more and heavier EST. Then, with prolonged occupational and social therapy, they would regain a normal mental status.

Many times it was noted that regressive electroshock therapy would bring out a latent paranoid, catatonic or hebephrenic type of ideation and behavior which had been covered by the ego defenses present at the initial investigation. It has been found that resistance to the standard dose of Sodium Pentothal or motor hyperactivity post-EST may be a measure of the underlying tensions, hostilities or refractoriness of the illness. It must be pointed out that in many cases it is difficult to differentiate between regressive symptoms and those representing an underlying catatonia. Many times there is an admixture of the two.

Azacyclonol (Frenquel) post-EST seems to be helpful in regaining contact with reality. At times some of the phenothiazines are useful in the post-EST period. These, however, are not considered curative.

Three deaths occurred which were directly related to EST. All were paranoid schizophrenics, two of whom had been alcoholics and one who gave a vague history of head injury 3 months before onset of his illness.

W.F.: Male, aged 49, an alcoholic for four years with a diagnosis of schizophrenia, paranoid type, received 64 EST's of a regressive type in divided courses between June and September 1950. He showed a consistent tendency to relapse and was eventually transferred to Dayton State Hospital where he died, three weeks after his last treatment. The autopsy showed: (1) Recent pulmonary infarction, (2) Acute exacerbation of chronic congestion of all organs, (3) Generalized arteriosclerosis, mild. Microscopic examination of the brain showed early encephalomalacia due to embolus.

P.M.: Male, aged 39, had a diagnosis of schizophrenia, paranoid type, with a vague history of head injury three months prior to admission. After this personality changes occurred. On a previous admission to the hospital he had received 17 ECT's. During this time his temperature had been above 100° sixteen times and above 102° twice. There was no known reason for this.

In June 1954 he was re-admitted to Miami Valley Hospital. Two days later a lumbar puncture was done which showed CSF normal. He received three EST's, ran a temperature to 103.2°, after which the treatments were stopped. Six days later he had a spontaneous convulsion and died.

Autopsy showed: (1) Bilateral pulmonary embolism with infarction, (2) Cerebral congestion well marked with early glial degeneration, (3) Enlargement of the hypophysis (1.5 times normal size).

H.H.: Male, aged 52, a paranoid schizophrenic of three years' duration gave a long history of alcoholism, had 25 EST's during March and April 1959. Soon after his last EST he developed peripheral vascular collapse probably secondary to factors other than cardiac origin. He developed an oliguria, his urea nitrogen which had been normal on admission rose to 126 mg.% and he became hypotensive. He died four days later.

The autopsy findings were: (1) Bronchopneumonia, bilaterally, (2) Chronic pyelonephritis, (3) Organized myocardial infarction and (4) Atherosclerosis of the aorta, advanced.

From these findings it is obvious that patients with a previous history of alcoholism, which is common in the paranoid schizophrenic, or those with a history of head injury should not be given regressive EST.

Lobotomies

Twenty schizophrenics were lobotomized, 19 of whom had had previous EST or insulin therapy with poor results. One patient, a chronic paranoid schizophrenic was of such long duration that it was felt a lobotomy was indicated without a test of shock therapy. There were 20 other cases lobotomized, as follows: Five manic-depressive psychoses, four of them in the depressed phase; six in-

volutional psychoses, five of them in the depressive phase, the other a paranoid; two depressive reactions, one complicated by alcoholism; three phobic reactions; three obsessive-compulsive neuroses; and one conversion hysteria.

The technic used was that devised by Grantham[8] of Louisville, Ky., who electrocoagulated the ventromedial quadrant of both frontal lobes, assuming that most of the affective fibers passed from the thalamus to this area. Apparently this assumption was correct as the procedure does remove the *overload* of affect bombarding the frontal lobes. The criteria established for the selection of cases for lobotomy was overt anxiety or hostility or any of its many symptomatic manifestations."

Two patients died in this series of 40 lobotomies. A 74-year-old male with diabetes who had an involutional psychosis with agitated depression died one month after his second lobotomy dut to failure to adhere to his diabetic program. The other was an involutional psychosis of a depressive type in a 57-year-old male who had had two cerebral thromboses seven and four months previously. Hypertension had been known for three years. He had not had previous EST. He had a good immediate reaction to the operation but died 12 days later of a coronary attack.

There were three complications, one severe and two mild. The mild ones consisted of post-operative major motor convulsions which were easily controlled by anticonvulsant medication. The severe complication was in a patient with an obsessive-compulsive neurosis, a male aged 57, who had not had previous EST because of a retinal detachment. After having a second lobotomy he was in good spirits and free of his anxieties and compulsions for 24 hours. He then had a grand mal seizure after which he was in a confused restless state. He was thought to have had a left parietal thrombosis. Within the next six hours he had 10 grand mal convulsions and was semi-comatose. The following day he was confused, non-responsive and did not recognize his relatives. He repeated words or phrases without comprehension. This continued for about four weeks with gradual improvement but it required seven months for him to fully regain his reading ability. During this time he had two grand mal convulsions in spite of anticonvulsant therapy. During the past three years, however, he has been working periodically. The electroencephalogram has been normal. Seven months after his second lobotomy he was reading with correct understanding of the content. He has had no convulsions for one year but is still under anticonvulsant medication. His compulsive activities have been minimal without anxiety.

Results of Grantham Lobotomies (Table V)

In the 20 schizophrenics lobotomized by the Grantham technic, 18 (90%) improved immediately after operation while 2 (10%) had poor results. After an average of 29 months observation, 17 (85%) were improved, while 3 (15%) were classified as poor results (one died).

The five manic-depressive psychoses did fairly well; four improved and the other had a poor result. The same appeared in the final results after 40 months average observation.

All six involutional psychoses had good immediate results. In the final results, after 18 months average observation, four were improved. Two died and are mentioned under deaths in Table V.

The depressive reactions, of which there were two, had good immediate and final results after eight months observation.

The six psychoneuroses all had good results, being relieved of their phobias or compulsions. The case of conversion hysteria did not do well.

For the whole group of 40 lobotomized patients, 37 improved immediately following lobotomy; three did not. After an average observational period of 28 months, 35 were improved and five unimproved.

Summary

(1) A series of schizophrenics who failed to respond to psychotherapy, chemotherapy or ordinary electroshock and/or insulin ther-

apy were given regressive EST. In the early years this was done inadvertently, but in recent years, deliberately. It was found that when patients were regressed the end results were better.

(2) Those cases which did not regress had a poor prognosis.

(3) It has been determined that there are various phases through which the patient *must go* in order to obtain relief from his psychosis. First, the remission phase, then the anxiety phase, followed by the regression phase. In a few cases it has been observed that a reanimation phase occurs. It is presumed that this is the final phase in the elimination of the psychotic picture but it takes persistence to carry the patient through weeks of the regression phase to await the reanimation phase. The subsequent phases of rehabilitation include those in the hospital, then in the home and the community and finally in the economic situation. During this period psychotherapy is administered.

(4) Patients who have a prolonged history of alcoholism or previous head injury should not be considered for regressive EST as they are poor risks.

(5) Forty patients who were refractory to long, heavy or repeated courses of EST and/or insulin therapy were lobotomized by the Grantham technic. A significant number improved as contrasted to those who obtained poor results.

(6) The lobotomized cases which did best were the paranoid, the catatonic and schizoaffective types of schizophrenia, the involutional psychoses, the depressive reactions, the psychoneurotic phobic reactions and the obsessive-compulsive neuroses. The manic-depressives did not do particularly well.

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