

*Dr. L. Weil*  
*7 1/2 years of successful electric*  
*(7 1/2 years of A.P.M.)*  
*XCVI: 403*  
*Case 1940*  
*PS 14*

"REGRESSIVE" ELECTROPLEXY IN SCHIZOPHRENICS.

By PAUL L. WEIL, M.D.,  
Senior Hospital Medical Officer, Mapperley Hospital, Nottingham.

[Received 7 November, 1949.]

It is generally accepted that deep insulin coma therapy is the treatment of choice for patients suffering from schizophrenia. A certain proportion of patients treated do not respond favourably to this form of therapy (in our series 23 per cent. of cases), and the question remains whether there are any alternative methods that would have a beneficial influence on such failures. We were also anxious to find some treatment for such chronic cases that were not considered sufficiently promising for coma treatment.

Encouraged by the favourable results with "regressive electric-shock in schizophrenics refractory to other shock therapies," obtained by C. J. C. Kennedy and D. Anchel (1948), we decided to investigate the possibility of applying this method, to the above-mentioned type of case. It should be clearly understood that "regressive" electroplexy is definitely different from what W. L. Milligan (1940), and M. Valentine (1949) among other authors have described as intensive electroplexy. It was our aim from the onset to get the patients regressed to such an extent that they became mute, incontinent and unable to take their food without spoon-feeding. We started, following the method described by Kennedy and Anchel, with two to four convulsions daily, but found soon that such a small number of convulsions per day, and twenty to thirty treatments altogether were not sufficient to obtain full regression.

As we had fully realized from the onset that this method of physical treatment cannot be without considerable risks we had all prospective patients carefully examined. We commenced treatment only after satisfactory X-ray examination of chest and spine, chemical and microscopic examination of urine, and full blood investigation (number of erythrocytes and leucocytes, haemoglobin, colour index, differential blood count, and blood sedimentation rate). Only patients found physically healthy were accepted for the treatment. In the light of our experiences we consider an electrocardiogram an advisable additional precaution.

We used for the induction of the convulsions a MacPhail-Strauss Electroconvulsant Unit, with a fixed time mechanism, and a convulsant voltage ranging from 70 to 150 volts. Our initial voltage was usually 85 volts. A lower voltage was, as a rule, insufficient to induce a convulsion. The threshold was

frequently so considerably increased that it was necessary to increase the voltage for almost every subsequent convulsion. It was, however, a general occurrence that the voltage had to be increased by five to ten volts in every treatment, with the result that the first convulsion at 8.30 a.m. was induced with, say, 85 volts, and the seventh and last one at about 2.30 p.m. with up to 150 volts. The interval between two treatments was thirty to sixty minutes. In addition to the usual precautions, we used a rubber pessary ring as a gag. This type is most useful, because it can be comfortably fixed between the molars.

We were able to achieve full regression in all but four patients (Nos. 9, 11, 12 and 18 of the Table), in whom the clinical symptoms made it imperative to terminate the treatment before sufficient regression had been achieved. Several patients became fully regressed with a fairly small number of convulsions spaced over a few days, whereas other patients required a great many convulsions spread over up to thirteen days for what we considered full regression. Most of the patients became confused after two days' treatment, and after four to six days they were unfit to take food, except fluids such as milk with egg. Thiamine hydrochloride, 13 mgm., riboflavin, 3 mgm., and nicotinic acid, 50 mgm., were added. The loss of weight was considerable in all but one patient. The treatment was terminated when the patient was in a state of complete confusion and utter apathy, mute, incontinent and unable to take food without assistance.

The nursing of the patients was no easy task, and taxed the nurses considerably. Constant attention to all pressure points was necessary to avoid bed-sores, and we would like to put on record that not a single patient had such lesions.

We were amazed to see how quickly, namely, after three to five days, most of the patients recovered from their poor state of nutrition and regained control of anal and urethral sphincters. After the physical recovery the state of confusion and apathy subsided within four to thirteen days from the termination of the treatment.

All patients treated showed florid psychotic features. After their recovery from the state of confusion and apathy the hallucinations and delusions were hardly or not at all in evidence, and most patients were somewhat more cooperative and better conducted than before the treatment. However, only a few were fit for a psychotherapeutic approach, and in spite of vigorous efforts all but two patients slipped back into their more or less chronic psychoses very soon after the termination of the treatment. These remaining two patients (Nos. 3 and 6) relapsed several months later.

In view of the considerable risks of the treatment only cases that had an otherwise hopeless prognosis were selected for it i.e. chronic schizophrenics with a gross conduct disorder, or more recent schizophrenics who had not responded to other methods of treatment, such as deep insulin coma therapy, prefrontal leucotomy, etc.

The table summarizes the following points:

"Regressive" electroplexy was given to ten male and eight female patients. The youngest was 24 and the oldest 51 years old. Their average age was 30½.

years. The shortest stay in hospital was one and the longest was 28 years. The average stay in hospital amounted to 7 years. The duration of the psychosis ranged from 1 1/2 to 28 years, and the average duration was 8 1/2. Between 34 and 80 convulsions were required to obtain sufficient regression with an average of 56 convulsions. The treatment was spaced over 4 to 13 days, and the average treatment took 8 1/2 days with almost 7 convulsions per treatment day. One female patient (No. 17) lost only 1 lb., whereas 2 male patients (Nos. 1 and 8) lost no less than 21 lb. in the course of not much more than one week. The average loss of weight was 13 lb. 9 oz., but one has to take into account that the patients were not fit for weighing in the first two or three days after termination of the treatment. Some patients recovered physically within four to six days, whilst some others required eleven to thirteen days for their physical recovery.

All 18 patients had pyrexia between 99° and 101° F. very frequently in the afternoon and evening. In most cases the temperature returned to normal during the night. The treatment was continued the following morning only when the temperature was within normal limits again. The cause of the pyrexia is unknown to us, but it is conceivable that the rise of temperature is attributable to a process similar to the mechanism causing the pyrexia in *Status epilepticus*.

In order to avoid undue dogmatism in the classification of schizophrenic psychoses, and as the number of patients treated was rather small, it will be sufficient to state that all 18 patients suffered from schizophrenia. Almost all of them were hallucinated, and all were unemployable. None of them had favourably responded, at least not for any length of time, to ordinary electroplexy, cardiazol shock therapy, deep insulin coma therapy, electroanarcosis, or prefrontal leucotomy. Only two male patients (Nos. 3 and 6) improved considerably for a time and were able to depart as socially recovered, but they had to be readmitted to this hospital quite recently with florid schizophrenic manifestations. One male (No. 8) and two female patients (Nos. 7 and 12) are still showing some improvement, and have become employable under supervision in hospital. Five male and five female patients show no change, and one male patient (No. 4) has steadily deteriorated.

One male patient (No. 9) died three days after termination of the treatment and death was attributable to extensive fatty changes in the myocardium and atheroma of the coronary arteries and aorta, uncommon findings in a young man of 28 years of age. The post-mortem examination had also revealed bilateral bronchitis. The pathological findings in the myocardium and arteries were confirmed histologically. One female patient (No. 18) died three days after early, immediate termination of treatment when the first clinical symptoms of bronchopneumonia on the left side had been detected. The post-mortem examination confirmed the clinical diagnosis. Extensive pleural adhesions of the right side were also found which had not been revealed by the X-ray photo of the chest taken prior to the commencement of the treatment.

Two female patients (Nos. 11 and 12) developed mild bronchopneumonia a few days after premature termination of the electroplexy therapy. Some biochemical examinations were carried out in five cases.

Case 9.

C.S.F. Sugar	100 mgm. per 100 c.c.
Chlorides	882 " " "
Proteins	30 " " "

These estimations were made about 24 hours before death.

Case 11.

Urine: Chlorides	880 mgm. per 100 c.c.
C.S.F.: Sugar	66 " " "
Chlorides	732 " " "

These results were obtained on the sixth day after termination of the electroplexy, when the patient showed some clinical signs of bronchopneumonia.

Case 12.

Urine: Chlorides	995 mgm. per 100 c.c.
C.S.F.: Sugar	67 " " "
Chlorides	730 " " "

Also this patient had a mild bronchopneumonia, and the examinations were carried out on the sixth day after the discontinuation of the electrically induced convulsions.

Case 15.

Blood chlorides	485 mgm. per 100 c.c. (a).
	462 " " " (b).
	457 " " " (c).

(a) Before, (b) on seventh day of, (c) one day after termination of treatment.

Case 16.

Blood chlorides	485 mgm. per 100 c.c. (a).
	471 " " " (b).
	442 " " " (c).

(a) Before, (b) on fifth day of, (c) one day after termination of treatment.

Case 9 showed abnormally high chlorides (and an increased amount of sugar) in the cerebrospinal fluid, but as the chlorides in the blood were not examined at the same time, it is not possible to give an interpretation of this isolated abnormal value. Following these findings chlorides in urine and c.s.f. and sugar in c.s.f. were examined in two patients with mild bronchopneumonia (Nos. 11 and 12). Serial blood chlorides were estimated in two more

TABLE.

(1) Number of case.	(2) Sex.	(3) Age.	(4) Years in hospital.	(5) Duration of psychosis (years).	(6) Previous treatment.	(7) Number of "regr." I.C.T.	(8) Duration of treatment (days).	(9) Duration of recovery (days).	(10) Loss of weight (lb.).	Psychotic condition.		(13) Complications.	(14) Remarks.
										(11) Before treatment.	(12) Nine months after treatment in all cases but Nos. 3 and 6.		
1	M.	25	3	3	Ins.	49	11	5	21	H.U.	c	Rise of temp. 7 ×	—
2	M.	25	3	3	E.C.T., Ins.	49	11	5	11	S.U.	c	Rise of temp. 8 ×	—
3	M.	24	5	6	E.C.T., Ins.	75	13	4	18	H.U.	a*	Rise of temp. 7 ×	Readmitted to hospital 8 months after termination of treatment.
4	M.	28	4	4	E.C.T., Ins., Eln., Leuc.	80	13	13	16	H.D.U.	d	Rise of temp. 9 ×	—
5	F.	25	8	8	E.C.T., Leuc.	68	8	5	10	C.H.U.	c	Rise of temp. 5 ×	—
6	M.	24	1	1½	Ins.	53	6	7	10	C.H.D.U.	a**	Rise of temp. 6 ×	Readmitted to hospital 7 months after termination of treatment.
7	F.	25	4	6	E.C.T.	64	8	13	10	H.U.	b	Rise of temp. 6 ×	—
8	M.	28	3	5	E.C.T., Ins.	70	8	9	21	H.U.	b	Rise of temp. 6 ×	—
9	M.	28	2	4	E.C.T., Ins., Leuc.	47	6	—	—	H.U.	—	Rise of temp. 6 × cardiac failure, bronchitis	Died 3 days after termination of treatment.
10	M.	28	5	6	E.C.T., Ins.	47	6	7	19	H.U.	c	Rise of temp. 6 ×	—
11	F.	40	8	18	E.C.T.	38	5	—	—	H.	c	Rise of temp. 5 ×, broncho- pneumonia	—
12	F.	22	4	4	E.C.T., Leuc.	40	5	—	—	H.U.	b	Rise of temp. 5 ×, broncho- pneumonia	—
13	M.	24	1	1½	Ins.	51	8	11	18	C.H.U.	c	Rise of temp. 5 ×	—
14	M.	34	10	11	Ins., Leuc.	51	8	7	18	H.U.	c	Rise of temp. 5 ×	—
15	F.	51	2	?	E.C.T.	64	12	8	6	C.H.U.	c	Rise of temp. 8 ×	—
16	F.	43	25	27	E.C.T.	67	12	8	11	H.U.	c	Rise of temp. 8 ×	—
17	F.	45	28	28	E.C.T., Leuc.	62	9	6	1	H.U.	c	Rise of temp. 5 ×	—
18	F.	29	11	12	Card., E.C.T., Ins.	34	4	—	—	H.U.	—	Rise of temp. 4 ×, broncho- pneumonia	Died 3 days after termination of treatment.

Ins., deep insulin coma therapy; E.C.T., electric convulsion therapy; Eln., electronarcosis; Leuc., prefrontal leucotomy; Card., cardiazol shock therapy. H., Hallucinations; D., delusions; C., confusional state; S., stupor; U., unemployable. a, Socially recovered and discharged; b, somewhat improved and employable under supervision in hospital; c, not improved; d, deteriorated. \* Examined when departing 2 months after termination of treatment; \*\* 4 months after.

cases (Nos. 15 and 16). The examinations in Cases 11 and 12 did not reveal anything abnormal. A steady decrease of the blood chloride values during and after treatment was found in Cases 15 and 16. Interesting as these findings in the two last mentioned cases are, it appears to be impossible to give a definite interpretation without further investigations. A cause might be dehydration of the patients. They lost considerable weight while under treatment, and therefore a certain degree of dehydration cannot be excluded. Since the chlorides were estimated in the whole blood (r.b.c. plus plasma), a relative increase in the number of r.b.c. might account for a gradual comparative decrease of the chlorides.

It is obvious that our unfavourable results are in marked contrast to the achievements published by Kennedy and Anchel. This difference is all the more remarkable as they were apparently able to get their patients sufficiently regressed with fewer convulsions on the average. (In the other hand, we have to mention that the average duration of psychosis was  $4\frac{1}{2}$  years in their series of 25 cases, whilst it was more than 8½ years in ours. We found that a number of our patients were somewhat more co-operative for a few days after their recovery from their confusional state, but we cannot confirm that "their minds seen like clean slates upon which we can write," and we were not "able to steer them back to reality and away from their psychotic thinking," to quote Kennedy and Anchel themselves. We have made such observations in cases of early schizophrenia in the course of deep insulin coma therapy, but never in our series of patients treated with "regressive" electroplexy.

#### CONCLUSIONS.

- (1) "Regressive" electroplexy had no lasting beneficial effect on eighteen schizophrenic cases treated. Eleven cases (nine fairly recent, two chronic) had insulin coma therapy without any lasting subsequent improvement, while the other seven were chronic schizophrenics who had not had insulin treatment.
- (2) This form of physical treatment is not only difficult to carry out, but also involves considerable risks.
- (3) In the light of our experiences we have discontinued the use of "regressive" electroplexy.

I should like to express my thanks to Dr. D. Macmillan, Medical Superintendent, who encouraged me to carry out this clinical investigation, Dr. W. Fabisch, who kindly performed the biochemical and histological examinations, and the nurses who devoted themselves to the difficult nursing of the "regressed" patients.

#### REFERENCES.

- KENNEDY, C. J. C., and ANCHEL, D. (1948), *Psychiat. Quart.*, **22**, 2, 317.  
 MILLIGAN, W. L. (1940), *Lancet*, **251**, 516.  
 VALENTINE, M. (1940), *J. Nerv. Ment. Dis.*, **109**, 95.

## A COMPARISON OF PERSONALITY TRAITS OF SCHIZOPHRENIC PATIENTS BEFORE LEUCOTOMY.

By R. R. HETHERINGTON and E. A. WHITE.

From the Department of Psychological Research, The Crichton Royal, Dumfries.

[Received 7 January, 1950.]

#### INTRODUCTION.

WHEN we compare the personalities of two or more individuals we should know whether traits we notice are also noticed by others, and whether such traits are common or rare. To obtain this information we must be able to compare the traits noticed by one observer with those noticed by others. We must also be able to compare the traits reported of one individual with those reported of others. Both comparisons must be made systematically and quantitatively. A method of doing this has been developed (1). It was employed by Frankl and Mayer-Gross (2) to assess the typical personality-leucotomy to the extent of their being discharged from hospital. It seemed profitable to study a sample of the same patients during the period of their psychosis, and to compare the personality-traits noted before and after the operation.

This paper describes the technique used and the problems encountered. It is intended to illustrate the merits and limitations of the method. Results of greater validity and significance would be forthcoming only from a larger investigation.

#### METHOD.

*Selection of sample.*—Twenty cases were selected from a group of 68 post-leucotomy patients already studied by Frankl and Mayer-Gross (2). This sample was made as homogeneous as possible as regards diagnosis and age, and was equally divided as regards sex. Ten men and ten women, all diagnosed as schizophrenic, and all aged between 20 and 40, constituted the group initially chosen for study. All these were long-standing cases observed over a period of years, and in this sense constituted a selected group which showed features which were more distinctive than would otherwise have been the case.

*Preparation of data.*—The data used in this investigation were the case-histories. These consisted of statements describing observed traits selected for record during a series of interviews, in many cases made by more than one medical officer. The first problem was to abstract from these data a personality-description of each patient over the period of his illness up to the time of the operation, and to present it in a form suitable for comparative study.