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INTENSIFIED ELECTRICAL CONVULSION THERAPY

IN THE TREATMENT OF MENTAL DISORDERS

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curve (fig. 1) shows that the blood-sugar level rose slowly, and showed no sign of falling within the next two hours; this shows that both absorption and disposal of sugar were slow. In case two hours might be insufficient time for such processes in starvation, blood-sugar levels were measured for four hours (curve for Dec. 18, 1943, in fig. 2). The blood-sugar level rose slowly for three hours, and then began to fall very slowly.

Glucose-tolerance tests during convalescence (fig. 2) show that, as the patient slowly improved, the blood-sugar curve gradually approached the normal, a faster rise being followed at the end of an hour by a fall. It also shows that, as convalescence proceeded, the initial blood-level became higher.

The same was found of the other constituents of the blood. Thus the plasma-protein, which showed enormous depletion during starvation and almost reversal of the normal ratio (albumin 1.33 g. per 100 ml. and globulin, including fibrinogen, 4.54 g. per 100 ml.), returned almost to normal. Lehman (1947) reported 0.75 g. per 100 ml. to be the lowest albumin content in his investigation of starvation.

Necropsy in fatal cases showed (1) pale and thinned-out small intestine with patchy denudation of mucosal epithelium and submucous haemorrhages; (2) shrinking of the liver cells with wide intercellular spaces and interference with the staining reactions of the liver tissue (haematoxylin and eosin); and (3) fewer cells in the islands of Langerhans and a few foamy cells. Campbell

In an attempt to improve on the results of previous recognised methods of administering electrical convulsion therapy (E.C.T.) the effect of increased voltage and duration has been investigated.

In the developmental stages of the new technique the voltage was gradually increased from the minimum necessary to produce a major convulsion—i.e., about 100 volts—to a fixed standard of 150 volts. The duration was similarly increased from 0.3 sec. to a standard of 1 sec. Later the effect of repeated electrical shocks administered during the convulsive phase was investigated. Ultimately a standard of 150 volts for 1 sec. followed by five shocks during the primary convulsion was reached, since it was noted that, once a major convulsion had been induced, no increase in intensity of the convulsion resulted from the extra shocks.

TECHNIQUE

Treatment is given daily and never less than two hours after an ordinary meal. The few patients who show apprehension, or are known to be restless after treatment, are given sedation with 'Sodium amytal' gr. 6 an hour before the treatment begins. Immediately before treatment the patient is encouraged to micturate and to blow the nose, and artificial dentures are removed.

Treatment is given on a bed with an ordinary mattress from which the pillows have been removed. Tight clothing is loosened. The only restraint necessary is a nurse on each side of the patient holding the wrist to the side and the shoulder down on the bed. Excessive abduction of the lower limbs is prevented, but flexion and extension are permitted. A gag consisting of two wooden spatulae covered with lint is placed between the teeth and kept in contact with the lower teeth to prevent the tongue from protruding. Excessive opening of the jaw is prevented by manual restraint. No preparation of the temporal skin is necessary, nor is the hair shaved.

The electrodes soaked with saturated saline are placed on the temples and a 50-cycle alternating current at 150 volts for 1 sec. duration is administered. About 4 sec. later five further shocks at 150 volts, each for 1 sec., are given in rapid succession by the timing switch. By this procedure the patient receives 1+5 shocks—i.e., one convulsion and five additional stimuli. Since salivation is increased immediately after a convulsion, a linen square is placed over the patient's lips.

Treatment is repeated daily until symptoms have evidently been relieved. If there is no pronounced improvement after three successive treatments of 1+5 electrical stimuli, the number of shocks is increased to 1+7, and further increased to 1+9 if there has been no response after five daily treatments at this time and voltage. Treatment is continued at the maximal level of intensity. To enable this large number of extra shocks to be given before the end of the clonic phase the time switch must be operated as rapidly as possible.

Daily treatment in every case is stopped as soon as there is a remission of symptoms or pronounced confusion is evident—i.e., the patient becomes faulty in habits. It is seldom necessary for the patient to reach this stage of confusion, because a remission usually takes place after the first few treatments. Amnesia resulting from the treatment can be ignored, and the course continued if a remission of symptoms has not already taken place. Memory always returns within a few days, and any distress caused by the amnesia responds to reassurance and explanation after each treatment.

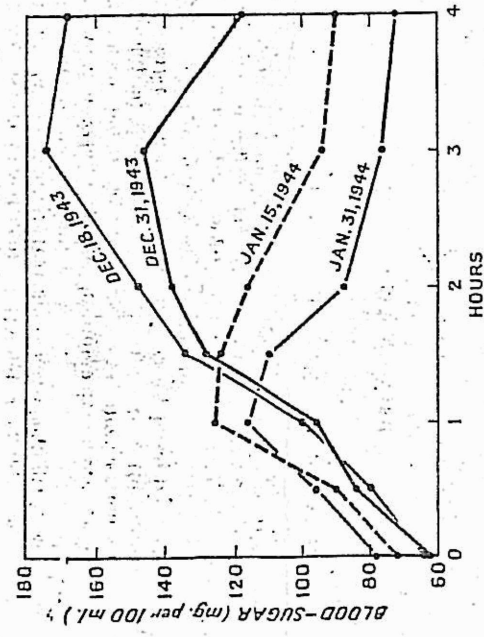


Fig. 2.—Glucose-tolerance tests done on Dec. 18, 1943, in advanced stage of starvation, and at different dates during convalescence (50 g. of glucose given by mouth).

and Kosterlitz (1947) obtained similar findings in the liver of experimentally protein-starved rats.

SUMMARY

In an investigation of 407 cases of slow starvation in the Bengal famine of 1943-45 not complicated by any disease, blood-sugar levels were found to be very low, but there was no symptom of hypoglycaemia.

In advanced starvation sugar-tolerance curves showed a slow absorption and excretion.

As convalescence proceeded, the curve returned towards normal, and the initial blood-level became higher. Necropsy showed considerable changes in the liver, intestines, and pancreas.

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INTENSIFIED E.C.T. RESULTS.

Type of case	Technique	No. of cases	Average no. of treatments	Average no. of treatment days	Average no. of days in hospital
Women	Old	58	6.9	26.5	63.0
	New	52	3.8	13.3	55.0
Melancholia	Old	12	10.5	52.5	146.0
	New	7	5.3	14.1	79.5
Schizophrenia	New	9	4.35	21.0	60.0
	New	6	6.35	43.5	92.5
Mania	Old	22	7.3	25.6	63.5
	New	6	2.66	12.8	62.5
Puerperal	Old	4	9.25	35.8	108.0
	New	6	5.85	24.6	73.0
Men	New	6	3.17	14.2	59.0
	New	6	3.84	4.8	31.0
Melancholia					
Schizophrenia					
Mania					
Hysteria					

Patients remain recumbent for at least an hour after each session, or until they awake.

TYPES OF CASES TREATED

All the patients treated were either voluntary or certified inmates of a county mental hospital. Numerous outpatients have also been treated but are not included in the results, since they do not give comparative figures of treatment days. Similarly, patients who have received treatment by both methods have been excluded.

The patients treated were aged 16-74, and no additional risks appear to be run in the elderly. Thirty patients over the age of 60 have been successfully treated by the new technique; the convulsion produced in older persons appears much less severe, probably because the muscles are weaker. Hyperpnea has not been found to be a contra-indication to treatment, and patients with a systolic pressure of 220 mm. Hg have been treated without complications.

The treatment was used to relieve acute symptoms in schizophrenia, facilitating later treatment with insulin.

INTERPRETATION OF RESULTS

The group schizophrenia includes all schizophrenic types. Cases of manic depressive psychosis are classified under the headings "melancholia" or "mania" according to the phase they presented at the time of treatment. Melancholia includes all cases presenting depression as a symptom, and no distinction between exogenous and endogenous depression has been made, since it was found that both types responded equally well to the new treatment. Puerperal includes all those with acute mental symptoms between two days and eight weeks after childbirth.

The figures for the number of days under treatment and the number of days in hospital (see table) have been calculated from the first day of treatment. This was done to make the results of the old technique comparable with the new, since previously some patients had been in hospital for various periods before treatment began, whereas treatment by the new method usually began a few days after admission to hospital.

The table shows that the average number of treatments received per patient in each group of cases has been about halved by the new technique. Similarly the average number of days under treatment by each patient is also halved. No figures are available for the groups mania, puerperal, and hysteria by the old technique. There is little difference in the number of days patients remained in hospital. This is because patients have been encouraged

to remain in hospital for at least four weeks after their last treatment, since it was believed in the past that relapses were likely during this period.

With the old technique, in the group of female melancholics 45 (77.6%) relapses occurred in 58 cases. With the new technique 20 (40.8%) relapses occurred in 49 cases. These relapses occurred on the average four weeks and two weeks after a remission of symptoms by the old and new methods respectively. The relapse-rate has therefore been reduced by about half, and since they take place on the average two weeks after a remission, patients could undoubtedly be discharged from hospital earlier.

Of cases of melancholia about 23.4% did not respond to the old technique, whereas only 11.9% did not respond to the new. There were 8 patients with melancholia who had received E.C.T. at other hospitals without apparent improvement and subsequently responded to the new technique.

Patients with acute mania improved rapidly, and none required longer than forty-eight hours in a protected room.

Patients still exhibiting acute symptoms immediately after treatment were treated again within an hour, and this usually produced a satisfactory response, but occasionally a third treatment on the same day was required. These treatments have conformed to the technique of 1+5 or more.

The risk of fracture seems to be less with the new technique than with the old. More than 300 patients have received treatment by the new technique, and more than 1500 individual treatments have been given, without fracture or dislocation.

As a development of this intensive E.C.T. technique, we have begun to investigate the effect of lengthening the initial shock beyond 1 sec. to reduce the number of repeated shocks, but sufficient cases have not yet been completed to give comparable results.

Our thanks are due to Dr. Neil McDiarmid, the medical superintendent, for permission to publish these results, and to the nursing staff for their co-operation and assistance.

LOCAL FASCIAL REPAIR OF FEMORAL HERNIA

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Much has been said by many about preventing recurrence of femoral hernia. Thread, catgut, silk, and wire, each material bringing in a wave of fashion, have all been described as ideal. The obliteration of the femoral ring with a strip of external oblique aponeurosis is a simple and reliable method and is a satisfying operation. It is not widely practised, and the importance of exact technique justifies attention being called to the procedure. It can be performed under local anaesthesia with ease.

The underlying principles of common methods have been either the approximation of the inguinal ligament to the pectineal fascia with staples or sutures, or the dragging down of conjoint tendon or rectus sheath flap towards the pectineal ligament (Astley Cooper's) as a shutter above the femoral ring. Both these methods depend on distortion, and the normal plane of the conjoint tendon is about 1 in. in front of the pectineal ligament. If it is sutured out of alignment there must be constant distortion in its pull, as part of the rectus and abdominal wall muscle mechanism.

The use of fascia strip facilitates repair by its breadth as a shutter in the femoral ring, as well as by partial approximation of the boundaries of the ring.

Technique.—The femoral sac is exposed and removed in the classical way by a combined approach through the