

A COMPARISON OF PROLONGED NARCOSIS AND CONVULSION THERAPY IN MENTAL DISORDER.

With a Note on a Centralized Treatment Unit for Both Sexes.

By Wing-Commander D. N. PARFITT, M.D., M.R.C.P., D.P.M.

[Received October 4, 1945.]

A DISCUSSION of the use of prolonged narcosis in mental disorder might seem to be something in the nature of a valedictory address. The ease of application of electric convulsion therapy (E.C.T.), and the excellent effects of its use (1, 2, 3, 5, 11, 25, etc.), particularly in melancholia, have tended to overshadow the benefits to be obtained from an efficient narcosis clinic.

The following description of the results achieved by the same observer in over 400 cases, during a period from 1939 to 1942, using both forms of therapy in similar groups, indicates that the advantages of E.C.T. are its simpler technique and some saving in time. These are extremely important values, and make E.C.T. the treatment of choice in the absence of special indications for narcosis.

The comparatively complicated procedure of narcosis involves a double penalty, for besides the difficulty as such, the treatment is, because of this, much more frequently carried out inefficiently or incompletely, and this leads to false depreciation.

The dangers of narcosis are well known; those of E.C.T. are not yet so familiar. Besides excitement and violence (9), spasticity (46), memory defects (4), widespread brain changes, not as a rule of serious extent (33, 36, 41, 42), epilepsy (36), which may come on as late as two years after treatment (28), there is the problem of fractures in something less than 3 per cent. (44, 46), and deaths from various causes (32, 34, 35). Sometimes hyperpyrexia or status supervene several days after the completion of treatment (16), and such late complications suggest that delayed effects of E.C.T. may sometimes be missed.

The necessity for extreme caution in the presence of heart disease, high blood pressure, arteriosclerosis, pulmonary tuberculosis, syphilis, etc., is well recognized, but sometimes conditions which would have been judged contra-indications can only be diagnosed post-mortem (10). The danger of fractures is not great; the 1 to 2 per cent. of spinal fractures can be ignored in practice, and only the fractures of femur, humerus, etc., and occasional dislocations, occurring altogether in about 1 per cent. of cases, cause serious difficulty. With careful selection my own experience has been fortunate. In over 200 cases in this series there were no serious complications directly attributable to E.C.T., and in several hundred other cases the incidence of complications was minimal.

An attempt to produce extended unconsciousness without a fit (12) may lead the way to even safer treatment, but subconvulsive doses have been regarded as ineffective (15, 25).

Regarding the safety of narcosis, under the special conditions obtaining in these cases, more than 250 treatments were completed without a single threat to life.

There has been a tendency to modify the first over-optimistic impressions of E.C.T. treatment (18), and Impastato and Almansi, describing results in 2,377 cases, found only 63 per cent. of involuntional melancholias clinically cured, and 57 per cent. of other depressions (24). Petersen and Turner (40) provided evidence that E.C.T. is by no means a panacea for mental ills. This leads to the most frequent indication for narcosis, in failed cases with E.C.T.

INDICATIONS FOR NARCOSIS THERAPY.

1. Cases not responding to E.C.T. It has been pointed out that those who improve with E.C.T. are not necessarily those who would do so with narcosis (24), and I have treated several patients in whom an apparent cure was obtained with narcosis after the failure of E.C.T.

2. Cases of mania not controlled by moderate sedatives and a preliminary convulsion. Mania is generally agreed to be more resistant to E.C.T. treatment than melancholia. A narcosis almost always produces striking improvement. The danger of relapse is considerable, but the treatment should be followed up by E.C.T., the patient being quiet and amenable.

3. Cases of melancholia under the same conditions.

4. Acute anxiety states, with evidence of autonomic disturbances. Rarely as well for disturbed hysterics.

5. Acute agitation in obsessive-compulsive psychoneuroses. I have several times produced sufficient stabilization in such cases to make simple psychotherapy, aimed at persuading the patient to adopt a tolerant attitude to his neurosis, effective enough for satisfactory adjustment. A narcosis might sometimes be tried before a pre-frontal leucotomy.

6. Excited catatonics. These patients often react badly to E.C.T. (24, 37), whereas narcosis may produce a phase of comparative quiet, making possible a more general course of therapy.

7. In some cases of severe depression with arteriosclerosis, with or without high blood pressure. It may sometimes be considered that there is much less risk of a vascular accident with narcosis than with E.C.T.

8. Severe depression with thyrotoxicosis. This is largely a matter of opinion, since barbiturates have to be used cautiously in thyrotoxicosis, but I prefer narcosis to E.C.T. in such cases.

9. Melancholia with schizophrenic symptoms. Here again the choice is largely a personal one.

10. In occasional cases where prejudice or fear are strongly aroused by the thought of fits, narcosis may be acceptable.

In short, it is safe to say that prolonged narcosis is still an essential weapon in the armamentarium of the psychiatrist.

WAR EXPERIENCE.

Regarding the acute anxiety states mentioned above, the value of narcosis in the severe mental disturbances arising out of the terrifying experiences of war has been properly appreciated (6, 23, 26, 45, etc.), and a return of 70 per cent. of cases of acute anxiety and fatigue to full aircrew combat duty has been claimed (20).

Narcosis has also been successfully employed in the subacute mental states, including psychoneuroses, associated with service personnel (7, 19, 48, etc.), and I have seen good results in such cases, but on the whole have been disappointed. E.C.T. has also been used for such psychoneuroses, especially anxiety (24).

La Barre and Kettermeyer (27) showed that intravenous barbiturate inhibits adrenalin secretion following insulin injection. In their opinion this action depended on the paralysis of thalamic centres. It presents a possible explanation of the relief afforded by narcosis to terror reactions of various kinds.

THE CENTRALIZED TREATMENT UNIT.

Worthing and his colleagues (51) advocated in 1943 the use of a separate, centralized unit for insulin, metrazol and electric convulsion therapies, and stressed the paramount importance of highly trained medical and nursing staffs.

Such a unit was in use from the beginning of 1940 for the cases here reported, with the variation that prolonged narcosis was carried out in the same, separate villa. The sisters and nursing staff generally were highly trained and acquired very considerable experience indeed of the various techniques, gaining unusual skill not only in general nursing, but in gastric lavage, tube feeds and intravenous injections, first with insulin treatment, and later with narcosis. They formed a team selected from the best available in the hospital. The introduction of sleep treatment into what had been primarily an insulin unit was received coldly by the nursing staff at first, but quick and satisfying results soon generated considerable enthusiasm.

The villa in use consisted of a centrally heated building with large, airy rooms, containing adjoining male and female wards for insulin treatment and two wards for each sex for narcosis, one each for treatment, and for recovery from stupor. Each ward contained six beds separated by low canvas screens, which hid patients from one another, but permitted easy, simultaneous observation. The screens were particularly convenient for "mass" E.C.T. treatment. In addition there were two single rooms to meet occasional difficulties in management.

Although the bulk of the food was supplied by the main hospital kitchens, the building had its own kitchen, where milk puddings, fresh teas and other extras which mean so much could be prepared.

All patients were recent admissions to a mental hospital, and the majority were certified. Men and women shared common sitting and dining rooms, used the same garden and attended the same occupational therapy department.

The men's lavatories were on the ground floor, women's on the first floor. No sex difficulties were met, and the noticeably improved deportment and increased friendliness of men and women were pleasing features.

A doctor's consulting room was included, so that he could be within a few seconds' call while insulin therapy was in progress, but could otherwise carry on with interviews and psychotherapy. For narcosis during the remainder of the day, there was a doctor available at a few minutes' notice, not necessarily in the building.

Noisy, aggressive patients and those with clouding of consciousness were excluded. This selection accounts largely for the excellent results achieved, and made it clear that the dangers of narcosis are almost completely limited to restless, confused and toxic patients.

TECHNIQUE.

The drugs used were somnifaine (80 per cent. of patients), or a mixture of medinal and luminal (20 per cent. of patients). It is unnecessary to give details of management, which have been well described, with various modifications, on several occasions for somnifaine (30, 31, 39, 47) and for medinal and luminal (8, 49, 50).

Certain changes from previous procedures were inaugurated and deserve mention. The difference between night and day was ignored as far as narcosis was concerned, since the treatment was conducted in darkened rooms fitted with silent, rubber floors. A competent sister and adequate assistance were available throughout each twenty-four hours. Medication was given four-hourly, four of the nursing staff making a round from patient to patient for each dose, giving at least one pint of nutrient fluid at each visit, by tube where necessary, providing any attention required, and taking routine observations. A minimum of six pints of fluid were thus administered daily always with the patient propped up. The speed and competence of the staff were noteworthy, and no accident or complication attributable to their increased responsibilities ever occurred. The treatment was almost always pushed to a depth where tube-feeding became necessary. The average duration of tube-feeding in somnifaine cases was two days, and in medinal-luminal cases it was over six days—a striking difference, dependent on the slower excretion and destruction of the medinal and luminal and the heavier toxæmia in consequence. The giving of sedative at regular times, usually twice a day, was recommended by Menzies (31). I gave the barbiturate every four hours, because certain investigations led me to believe that the level of the blood barbiturate could be kept most even with this frequency. I still think this is so for somnifaine, but with medinal and luminal mixture four times a day should be sufficient.

Following test doses of 1 c.c. and 2 c.c. of somnifaine on successive days, the treatment was commenced with a prescription for $\frac{1}{2}$ c.c. to be given four-hourly, and this was steadily increased or varied as required, always moving by quarters of a c.c. Even with the stringent safeguards provided against noise, the average dose of somnifaine needed to provide up to 20 hours' sleep

daily was 7.3 c.c. and, of the mixture of 5 gr. of medinal and 1 of luminal to 1 drm., the average daily dose was 7.1 drm. I am unable to understand how satisfactory treatments are conducted with a dose of somnifaine rarely exceeding 4 c.c. (22, 29). During the emergence from narcosis medinal gr. 10 was given once or twice a day for a few days.

In the first 20 per cent. of cases, something over 50 patients, insulin 5 units was given with each dose of sedative. Its omission did not lead to any noticeable difference.

A few aseptic, necrotic abscesses developed when somnifaine injections were confined to the upper and outer quadrants of the buttocks, and although they were easily cleared up by one free incision and the breaking down of small pockets with the finger, it was found possible to avoid them altogether by spreading the injections. Until the staff became used to the different sites for injection 24 spots were marked on the skin with an indelible pencil, using the deltoids, pectorals, erectores spinae and lateral thighs as well as the buttocks, so that the same place was chosen only every four days.

No special psychotherapy beyond the simple encouragement of the ordinary doctor-patient relationship was employed.

The E.C.T. treatment followed the usual lines of gradually increasing the dose in time or intensity of current in order to produce fits with minimal dosage. The patient, in loose, warm clothes, lies on a bed fitted with a spring mattress. No restraint was practised, but a careful watch was kept for dangerous movements. The spine was never X-rayed, but excluding this possibility of error, there were no complications. One severe, chronic case of rheumatoid arthritis took the treatment without difficulty.

THE COURSE OF TREATMENT.

The narcosis was remarkably smooth and there were no deaths or serious complications. Deaths occurring within two years of the treatment are briefly mentioned later. One may repeat that it is clear from this that deaths from narcosis are confined to those excluded from this series by being noisy, violent or confused.

Sleep averaged 18.4 hours daily for the whole series, the treatment lasting on an average 11.8 days, of which 7.4 days had 18 or more hours' sleep. No patient was under treatment less than 6 days, but treatment was terminated if there were any signs of danger developing. Fifteen per cent. gained weight, but there was an average loss of 1.5 lb. during treatment. On rare occasions the loss or gain was astonishing—up to one stone.

There were slight rises of temperature on odd days in 50 per cent. of cases, the incidence rising steadily from the first day to the fifth, making a plateau to the ninth, then diminishing in proportion to the frequency of the termination of treatment.

Eighteen patients vomited on 36 days, averaging two days each. The standard treatment was gastric lavage before feeds, and this was always effective. Occasionally the foot of the bed was raised and $\frac{1}{100}$ gr. of atropine injected.

Two minor collapses were managed by ordinary anti-shock treatment and

intravenous picrotoxin (14). Abdominal distension and retention of urine were rare and gave no difficulty. Restlessness was infrequent. Treatment was suspended three times because of sore throat, while jaundice, phlebitis and blood in the stools occurred once each.

RESULTS OF TREATMENT.

Results of treatment in abnormal conditions are often difficult to assess, especially when many recoveries would occur without specific therapy. Efficacy depends a great deal on the belief and confidence of the physician; even in such profound aberrations as melancholia and schizophrenia, the patient responds to the tacit assumption of cure implied by active and time-consuming attention on the part of doctor and nurses, and this measure of response would be evoked by injections of sterile water accompanied by a complicated ritual. This fact notwithstanding, I do not think there can be reasonable doubt that treatment as here described produces amelioration and shortening of the malady in a large proportion of cases.

In the following tables E. = E.C.T. treatment, or, in 20 per cent., azoman or cardiazol. (Fits averaged 9 per patient treated, but sometimes 15 or 20 were given.) N. = narcosis. I. = insulin.

MELANCHOLIA.

The information at my disposal does not make it possible to differentiate involuntional melancholias. If this were possible, doubtless the results with E.C.T. in such cases would show up very favourably (21, 38, etc.).

As the average age of 147 cases of recent melancholia treated was 47.9 years, involuntional cases were almost certainly well represented. Almost all were under certificates of insanity. Discharge from hospital was roughly the equivalent of clinical cure. At the very least certification ceased to be necessary and suicide was no longer a danger.

I am unable to state the relapse rate, but as far as I know readmissions within a few years were very infrequent.

TABLE I.

Treatment.	Number of patients.	F.	M.	In hospital.
E. only . . .	42	42	0	3.9 months.
N. only . . .	56	36	20	4.5 "
E. after N. . .	5	5	0	6.5 "
N. after E. . .	7	4	3	6.9 "

Twelve further cases, most of which had both treatments, remained chronic psychotics, and three of these died within two years of treatment. Fitzgerald (11) reports a reduction in hospital from 6-9 months to 2-3 months with E.C.T. This may not include the further month usually recommended for E.C.T. cases, to guard against relapse.

TABLE II.—*Melancholia with Complications. All treated by Narcosis, three having had E.C.T.*

	No.	F.	M.	Age.	Disch.	In hospital.
Plus schizophrenic symptoms	12	10	2	41	9	4·8 months.
Plus arteriosclerosis	8	4	4	55	6	2·8 „
Plus hyperthyroidism	5	5	0	46	5	3·3 „

One man was a post-encephalitic. Several cases of melancholia included in Table I had thyroid extract as well as other treatment. Altogether 90 per cent. of 147 acute cases were discharged.

TABLE III.—*Extra Cases Treated with E.C.T.*

	Number.	Improved.	Disch.	Deaths.
Chronic melancholia (over two years)	6	1	1	1
Senile dementia with depression	5	0	0	3
Epilepsy with depression	5	0	0	3
General paralysis with depression	3	2	0	1

The deaths were within two years, and apparently not related to treatment.

MANIA.

There were 36 cases, 30 women and 6 men ; at least 7 were recurrent. The average age was 46·0.

TABLE IV.

Treatment.	Number.	In hospital.
E. only	5	3·6 months.
N. only	19	5·2 „

Five more were discharged, three with narcosis after E.C.T. and two with E.C.T. after narcosis. The average time in hospital of this group was 11 months.

Of the seven who became chronic psychotics, three died within two years. They had all had narcosis and four had had E.C.T. The deaths were from senility and pneumonia and apparently unrelated to treatment.

Together, 80 per cent. of patients with mania recovered with narcosis or E.C.T., or both.

SCHIZOPHRENIA.

One hundred and sixty-six cases, many recurrent. Patients treated only with insulin are omitted, as are six schizophrenics with "manic" excitement, given a brief narcosis as a prelude to insulin.

Fifty-four were unimproved, although three left hospital, 31 after E.C.T. or narcosis, or both, as well as insulin, the others after narcosis or E.C.T. only. The discharge rate was nearly 70 per cent., but the standard of "cure" was

TABLE V.

Treatment.	Number of patients.	Time in hospital.
E. only	38 .	4.8 months.
N. only	33 .	6.5 „
N. after E. . . .	7 .	4.8 „
E. after N. . . .	11 .	4.8 „
E. after I. and N. . . .	3 .	7.0 „
I. after E. and N. . . .	20 .	5.3 „

not as high as with melancholias, many of the schizophrenics or paraphrenics having residual symptoms. Eight patients had had T.A.B. vaccine intravenously. Eleven of the chronic patients died within two years of treatment.

Among the patients of this group treated by narcosis only, age appeared to make little difference.

TABLE VI.

Age.	Number.	F.	M.	Av. age.	In hospital.	Discharges.
Under 30	25	23	2	24	5.1 months	15 (60%)
Over 30	24	21	3	45	7.9 „	18 (75%)

I believe insulin to be the best available treatment for schizophrenia, but E.C.T. and narcosis should be available for successive trial.

Treatment in failed cases was most frequently abandoned for mental deterioration, but occasionally for physical deterioration. It is possible that a too vigorous programme of treatment impairs vitality. There were 25 deaths among 368 of these selected new admissions within two years of treatment. This is a subject for future investigation.

One hundred chronic schizophrenics, for whom treatment by special means had been abandoned, were given E.C.T. for the first time and 27 were discharged. This is a most deceptive figure, as in only two or three was improvement sufficient to approximate to a cure. As a rule arrangements were made by relatives, which happened to post-date treatment. Delayed recoveries are known, of course, without treatment.

Taken together, one gains the impression from these results that the cure rates for narcosis are as good as those for E.C.T. The latter has pride of place because of its technical advantages, but although resistant cases often defy all forms of treatment, every now and then a patient recovers with one form of therapy where the other had proved ineffective. It is impossible to say, of course, how often a repetition of the same treatment would have been equally efficacious.

If the views of Gellhorn (13) and Quastel (43) are correct, that all forms of "shock" treatment, insulin, narcosis, E.C.T., depend on cerebral anoxia for their action, it is not surprising that total results are very much the same, when one form of treatment is compared with another.

PSYCHONEUROSES.

Cook and Ogden (5) have reported good results with convulsion therapy in hysteria, as well as in melancholia. I cannot confirm this, but results are difficult to assess. Patients were voluntary admissions and almost all left hospital.

Of 10 chronic psychoneurotic depressions treated with narcosis, nine went home after an average stay in hospital of nearly 11 months; one died several months after treatment.

Of 16 mixed, rather chronic psychoneurotic reactions, neurasthenic, hysterical, or hypochondriacal, treated by narcosis, two after E.C.T., all returned home in an average time of 4.1 months.

Of 12 hysterics and neurasthenics treated with E.C.T. only, all went home in one to two months. The improvement rate was about 30 per cent. for both kinds of treatment, and on the whole results in the psychoneuroses were disappointing.

CONCLUSIONS.

1. Some modifications in the technique of narcosis, increasing safety and effectiveness, are mentioned.

2. The success of a centralized treatment unit for recent admissions in a mental hospital, where both sexes share common dining and sitting rooms, etc., is described.

3. The essential nature of prolonged narcosis as one of the treatments available for mental disorders is advanced.

REFERENCES.

1. ANDRATSCHKE and ROGERSON (1943), *Brit. Med. J.*, i, 780.
2. BATT (1943), *J. Ment. Sci.*, **89**, 289.
3. BENNETT (1943), *J. Nerv. Ment. Dis.*, **98**, 23.
4. BRODY (1944), *J. Ment. Sci.*, **90**, 777.
5. COOK and OGDEN (1938), *Lancet*, ii, 885.
6. CRAIGIE (1942), *Brit. Med. J.*, ii, 675 (Correspondence).
7. CURRAN and MALLINSON (1941), *ibid.*, i, 303.
8. DAY (1936), *Texas State J. Med.*, **32**, 417.
9. DYNES (1939), *J. Ment. Sci.*, **85**, 493.
10. EBAUGH, BARNACLE, and NEUBUERGER (1943), *Arch. Neurol. Psychiat.*, **49**, 107.
11. FITZGERALD (1943), *J. Ment. Sci.*, **89**, 73.
12. FROSTIG, HARNEVELD, REZNICK, TYLER and WIERSMA (1944), *Arch. Neurol. Psychiat.*, **51**, 232.
13. GELLHORN (1938), *ibid.*, **40**, 125.
14. GILLMAN (1940), *Lancet*, i, 598.
15. GOTTESFELD, LESSE and HERSKOVITZ (1944), *J. Nerv. Ment. Dis.*, **99**, 56.
16. GRABNICK (1944), *Arch. Neurol. Psychiat.*, **51**, 397.
17. GRINKER (1942), *ibid.*, **47**, 1028.
18. GRONNER (1944), *Illinois Med. J.*, **85**, 29.
19. HADFIELD (1942), *Brit. Med. J.*, i, 281 and 320.
20. HASTINGS, GLUECK and WRIGHT (1944), *War Med.*, **5**, 6.
21. HENDERSON, TOD and DALY (1943), *Edin. Med. J.*, **50**, 641.
22. HENNELLY (1936), *J. Ment. Sci.*, **82**, 608.
23. HUBERT (1941), *Lancet*, i, 306.
24. IMPASTATO and ALMANI (1943), *N.Y. State J. Med.*, **43**, 2057.
25. KALINOWSKY (1943), *Arch. Neurol. Psychiat.*, **50**, 652.
26. KUBIE (1943), *War Med.*, **4**, 582.
27. LA BARRE and KETTERMEYER (1941), *Arch. Intern. Pharmacodyn.*, **66**, 305.

28. LIEBERT (1942), *J. Amer. Med. Assoc.*, **118**, 119.
 29. McCOWAN (1936), *Lancet*, i, 508.
 30. MEERLOO (1933), *J. Ment. Sci.*, **79**, 336.
 31. MENZIES (1937), *Lancet*, ii, 559.
 32. MEYER and TEANE (1945), *Brit. Med. J.*, ii, 42.
 33. MEYER (1944), "Recent Progress in Psychiatry," *J. Ment. Sci.*, **90**, 218.
 34. NAPIER (1944), *J. Ment. Sci.*, **90**, 875.
 35. NIGHTINGALE and MEYER (1940), *ibid.*, **86**, 819.
 36. NUSSBAUM (1943), *Psychiat. Quart.*, **17**, 327.
 37. PALMER, H. A. (1937), *J. Ment. Sci.*, **83**, 636.
 38. PALMER, H. D., HASTINGS and SHERMAN (1941), *Amer. J. Psychiat.*, **97**, 1086.
 39. PARFITT (1936), *Lancet*, i, 424.
 40. PETERSEN and TURNER (1943), *Med. Clin. N. Amer.*, **27**, 1019.
 41. POLANTIN, STRAUSS and ALTMAN (1940), *Psychiat. Quart.*, **14**, 457.
 42. POLLACK (1941), *Arch. Neurol. Psychiat.*, **46**, 549.
 43. QUASTEL (1939), *Proc. Roy. Soc. Med.*, **33**, 951.
 44. SAMUEL (1943), *J. Ment. Sci.*, **89**, 81.
 45. SARGANT (1942), *Brit. Med. J.*, ii, 574.
 46. SMITH and HASTINGS (1943), *Amer. J. Psychiat.*, **100**, 351.
 47. STRÖM-OLSEN (1933), *J. Ment. Sci.*, **79**, 638.
 48. TREGOLD (1941), *Brit. Med. J.*, ii, 109.
 49. WILSON and GILLMAN (1938), *J. Ment. Sci.*, **84**, 991.
 50. WITT and CHEAVENS (1934), *Texas State J. Med.*, **30**, 517.
 51. WORTHING, BIGELOW, BINZLEY and BRILL (1943), *Amer. J. Psychiat.*, **99**, 692.
-