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Recovery from ECT in Elderly Patients

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SUMMARY Nine elderly depressed patients were given ECT in courses which alternated unilateral and bilateral electrode placement; recovery times were measured. When compared with similar times for younger patients, recovery took on average five times as long from unilateral treatment and nine times as long from bilateral. Within the group, bilateral treatment took significantly longer for recovery than unilateral treatment and was significantly more sensitive to cumulative effect and interval effect.

Introduction

Studies of electroconvulsive therapy and its after-effects have rarely included elderly patients, yet depression is twice as often the reason for hospital admission over the age of 65 as under it (Department of Health and Social Security, 1977), and older depressed patients are said to respond relatively well to ECT (Mayer-Gross *et al*, 1966; Sargant *et al*, 1972; Strömgren, 1973). At the same time, the ageing brain might be expected to be more vulnerable to the treatment's unwanted side-effects, principally those affecting memory. What these effects might be, or their likely duration, cannot at present be predicted with any accuracy; reported here is the first phase of a study which will examine both the benefits and hazards of ECT used on a depressed elderly population, and will seek out means to prevent adverse outcomes.

The present investigation is concerned purely with post-ictal recovery. The use of unilateral ECT applied to the non-dominant hemisphere has been shown to shorten recovery time and reduce the number of side-effects in younger patients while at the same time having an equivalent therapeutic effect to a bilateral technique (Halliday *et al*, 1968; Valentine *et al*, 1968; Zinkin and Birtchnell, 1968); our hypothesis is that these differences will be even greater in the over-65's.

ECT is now often given to out-patients; whether the elderly can be safely treated on this basis is uncertain, but a knowledge of expected recovery patterns is essential so that relatives or nursing staff can be advised. Even transient confusion or headache can be distressing and can lead to refusal of further treatment.

Method

In the study were nine elderly patients (2 male, 7 female; mean age 72.4; s.d. 5). The diagnosis of depressive illness required the presence of depression of mood of at least a month's duration associated with sleep and appetite disturbance and loss of energy, and without any pre-existing psychiatric condition such as a toxic confusional state or schizophrenia. A diagnosis of mild or moderate senile dementia did not by itself exclude a depressed patient from ECT treatment, but minimum requirements for inclusion in the study were that each patient should be able to state correctly his name, the day, the month, the year, and the name of the hospital.

In order to isolate recovery time as a single variable, each patient was used as his own control. During a given course unilateral and bilateral treatment were alternated and after each treatment a 'blind' observer measured the rate of recovery of consciousness, respiration and orientation (name, hospital, day, year, month). Unilateral treatment was applied to the non-dominant hemisphere; dominance was determined before treatment by a standard questionnaire (Zamora and Knaebling, 1965);

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electrode placement was as described by Strömgren (1973).

Each patient received, throughout his course, a constant dose of anaesthetic and muscle relaxant. The apparatus was an Ectron Mark 4 delivering approximately 10 Joules in a bi-directional pulse waveform. This was found to be the minimum setting that would consistently evoke a fit. As each patient was being compared with himself at different times, variables that would otherwise have been important, such as anaesthetic dose/body weight ratio, were not considered.

Results

A sample set of results is shown in Table I. The measured intervals, based on Valentine *et al* (1968), are numbered as follows: (1) Time from shock to onset of spontaneous regular respiration, (2) Time from shock to opening of eyes on command, (3)—(7) Time from shock to giving correct surname, name of hospital, year, month and day respectively.

The longest of each set of times was taken as the time for full recovery, e.g. for the second treatment it is 2.5 minutes. Thus for each patient we arrived at a mean time for full recovery from unilateral treatment (in the above example 19.2 minutes) and for full recovery from bilateral treatment (in the above example 44.0 minutes).

The means for all patients are shown in Table II. The recovery times were much longer following bilateral treatment in all but one patient and in five patients they were more

TABLE I

Recovery times (in minutes) for female aged 73

Day	1	3	5	8	12
Technique	Bilat	Uni	Bilat	Uni	Bilat
1	1.9	0.5	1.2	1.5	1.2
2	9.2	1.5	8.2	3.5	9.0
3	12.9	2.0	16.0	5.2	9.5
4	15.5	2.2	18.9	8.7	10.0
5	28.7	2.5	74.2	11.7	29.0
6	21.2	2.5	20.2	36.0	29.0
7	27.1	2.2	19.7	27.0	10.5

TABLE II

Mean times (in minutes) for full recovery: all patients

Sex	Age	Bilat	Unilat	Daily medication	
F	82	17.7	5.6	Nil	
F	74	8.3	4.3	Nil	
F	68	150.9	21.9	Imipramine Nitrazepam	175 mg 10 mg
F	74	43.9	19.9	Amitryptyline Nitrazepam	150 mg 5 mg
F	77	57.9	14.8	Flupenthixol Nitrazepam	1 mg 10 mg
M	75	310.5	14.7	Imipramine Procyclidine	175 mg 15 mg
M	67	13.7	14.5	Thioridazine Nitrazepam	50 mg 5 mg
F	69	79.8	30.0	Prothiaden Diazepam	75 mg 6 mg
F	66	32.7	20.1	Lithium Trimipramine	600 mg 125 mg

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than three times as long; the Wilcoxon Matched-Pairs Signed-Ranks Test was applied, and the difference emerged as highly significant ($P < 0.01$).

There was an apparent tendency for all recovery times to lengthen as treatment progressed, suggesting some degree of cumulative effect. To test for this, mean times for full recovery were set out as in Table III. When recovery times between the first and last bilateral treatment in each course were analysed, the difference was significant (Wilcoxon Test, $P < 0.05$). There was no significant difference in the recovery time between the first and last unilateral treatment.

TABLE III

Cumulative effect (times in minutes)

First unilat	Last unilat	First bilat	Last bilat
9.3	19.7	8.6	18.9
24.6	34.2	67.5	91.9
8.9	12.6	18.6	324.3
16.6	13.1	63.7*	27.6
10.2	4.2	296.0	324.3
5.3	3.0	8.5	40.9
2.5	36.0	12.1	6.6
		25.7	29.0

* A second shock was required. This pair of results is excluded from the calculation of significance.

The question of interval effect also arises. In most courses treatment was given on Monday, Wednesday and Friday; this means that some treatments were given after an interval of two or more days and some after an interval of one. When recovery times for bilateral treatments given after a one-day interval ($N = 8$) were tested against times for those given after an interval of two or more days ($N = 8$), the difference was again significant (Wilcoxon Test, $P < 0.05$). When the same test was applied to unilateral treatments (11 after a one-day interval, 7 after an interval of two or more days) the difference was not significant.

Discussion

Most clinicians believe that, although equally effective, unilateral ECT causes fewer side-effects than bilateral ECT, but there is still no general consensus, especially where older patients are concerned. Valentine *et al* (1968), for example, showed that unilateral pulse ECT could be used with almost complete freedom from side-effects, and that relief of depression was at least equal to that following bilateral treatment. Other researchers have, however, reported an 'impression' that bilateral ECT worked rather more quickly and that fewer treatments were required in a course (Cannicot, 1962; Abrams, 1967; Fleminger *et al*, 1970). In the largest and most thorough study published to date, Strömgren (1973) found that bilaterally treated older patients (45–65 years) fared significantly better than those treated unilaterally.

The question of relative benefit is therefore still open, and the second part of our own study will be concerned with this area, when a full course of either unilateral or bilateral treatment will be given to each (elderly) patient. Most earlier studies have been criticized on the grounds of being too diffuse in their aims (d'Elia and Raotma, 1975); they were often uncontrolled, measurement was not blind, or groups were heterogeneous. This preliminary study should provide much more reliable comparisons of post-ictal recovery patterns than are at present available, especially for the older age-groups.

How did the elderly recover in comparison with younger patients? The only studies that used similar measures to our own were those by Valentine *et al* (1968) and Halliday *et al* (1968). Our mean recovery time for all patients as compared with those in Valentine's study was five times as long for unilateral treatments and nine times as long for bilateral treatments. Compared with the Halliday study, recovery time from unilateral treatment in our study was about the same, but following bilateral treatment recovery took twice as long. The second group did, however, use sinusoidal current, which was shown by Valentine to have a lengthening effect on recovery time.

Within the elderly group recovery time was significantly longer after bilateral treatment than after unilateral treatment. In two patients the difference was very great, recovery from bilateral treatment taking on average six times

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and twenty times as long as from unilateral treatments. In practical terms, this often meant the difference between a patient who was fully orientated and alert minutes after the treatment and one who was confused, and consequently anxious and frightened, for many hours. This difference is generally in accord with, although greater than, that found in other studies. There was, it should be noted, considerable individual variation within our group (Table II), but the number was too small to analyse for possible predictors; certainly the patients who took longest to recovery had no outstanding clinical features that differentiated them from the others.

Bilateral ECT was also found to be more sensitive to interval effect and cumulative effect. The recovery time for bilateral treatment became significantly greater as each course progressed; also, bilateral treatments given after a one-day interval took significantly longer for recovery than those given after an interval of two or more days. This resembles the findings of Squire and Miller (1974). It has recently been recommended that ECT should not be given more often than twice weekly (Royal College of Psychiatrists 1977); our findings support this view, especially when elderly patients are receiving bilateral treatment.

Any further recommendations to emerge from this part of the study will depend to some extent on the question of whether bilateral treatment in the elderly is therapeutically more potent than unilateral treatment, and this has not yet been proven. The issue is partly clouded by a belief that transient memory disruption is in itself a positive component of therapy; older depressed patients, often suffering from pathological guilt, frequently believe that the aim of treatment is partly to erase memories, and clinicians too sometimes query whether a degree of short-term memory impairment heralds a better eventual outcome. However, there are no grounds for this belief, since the therapeutic effect of ECT has been shown to depend on the occurrence of a convulsion (Robin and Harris, 1962; Freeman *et al*, 1978) and the side-effects appear to depend on the volume and site of brain tissue traversed by the electric current (Halliday *et al*, 1968; Zinkin and Birtchnell, 1968; d'Elia and Raotma, 1975; Fromholt *et al*, 1973; d'Elia, 1976).

None of the patients in the study did badly or needed an unusually long course, and at present it seems that the therapeutic benefits of the two forms of treatment do not differ greatly. Our results therefore indicate that in elderly patients unilateral pulse current to the non-dominant hemisphere is the technique of choice. Where bilateral ECT is given, it should not be given more often than twice weekly. Bilateral ECT should not be given to elderly out-patients, as recovery patterns are unpredictable and there may be an undue degree of confusion in the post-ictal period.

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