

ideal. A larger study including other centres would help to test these impressions and assess alternative approaches.

Acknowledgement

We would like to thank Dr Fiona Macmillan, Senior Lecturer, University of Birmingham and Dr Martin Davies, Consultant Psychiatrist, Midland Nerve Hospital for their very helpful and relevant comments on the paper.

Reference

FINLAY, L. (1988) *Occupational Therapy: Practice in Psychiatry*, London: Croom Helm.

Further reading

BALLINGER, B. R. (1971) The patients' view of psychiatric treatment. *Health Bulletin*, 29, 192–196.

COIA, D. & JOICE, A. (1989) Occupational therapy – the forgotten speciality with the community mental health team? *Psychiatric Bulletin*, 13, 420–421.

Psychiatric Bulletin (1992), 16, 408–410

Audit in practice

Short duration induced seizures and therapeutic outcome at electroconvulsive therapy applications

J. P. JOYCE, Locum Associate Specialist, Ogwr Health Unit, Glanrhyd & Penyfair Hospitals, Bridgend, Mid Glamorgan CF31 4LN

Electroconvulsive therapy (ECT) is reported the most effective treatment for severe endogenous depressive illness but may also be useful in the treatment of mania and schizophrenia. It seems that the seizure is a necessary component of the overall treatment but it is undecided what constitutes an adequate duration of seizure activity.

The Royal College of Psychiatrists (1989) recommend that seizures of 25 seconds or more should be aimed for and that restimulation at a given session should be carried out if a seizure of 15 seconds or less occurs. Restimulation at a given session should also be carried out if there is no observable seizure, or if there is a unilateral or focal seizure.

I decided to examine all applications of ECT to patients in the local psychiatric hospital to ascertain what proportion of the total have seizures of duration less than 15 seconds and to assess the reasons for these patients to have short duration fits. I also looked at the therapeutic outcome for this group of patients.

The study

A list of all patients given ECT is available in the ECT Department. I examined the ECT records as well as medical case-notes of all patients who had received ECT between 1 January and 30 June 1990.

I designed a proforma to gather biodata of age, sex, diagnosis, previous applications of ECT, current and previous dosage of anaesthetic agent, muscle relaxant, and other medications, and details of the ECT stimulus used. If only one application of ECT was given in that six month period I examined the outcome for the whole course of ECT.

The ECT machine used during the time of this study was a Duopulse Constant Current Apparatus, serial number 2C-411 manufactured by Ectron Limited. The routine setting on the ECT machine was 4 seconds on ECT 1 (110 millicoulombs). Only if a patient had a missed fit at a given application was a second application given with either ECT 2 for 4 seconds or ECT 1 for 5 seconds. The decision about laterality of ECT was made by the consultant in charge of the patient at the beginning of a course of ECT.

Findings

The total number of ECT applications in the six month period studied in detail was 221 and included a total of 33 courses. The total number of ECT applications in the 33 courses was 287 which gives an average number of applications per course of 8.7. The patients comprised 12 men and 21 women. The age range of the patients was 21 to 84 and 15 were aged over 65, 9 aged 45 to 64 and 9 were less than 45. The final diagnoses of these patients (ICD 9) were: schizophrenic psychoses (6), affective disorders (22), neurotic disorders (3), personality disorders (1), depressive disorder not elsewhere classified (1).

The comments made by the junior doctors about the seizures which the patients experienced were examined. In 88 cases out of the 221 the doctor noted a short fit, unilateral fit, a timed fit of less than 15 seconds duration or no fitting movements at all. This comprises 40% of the applications of ECT. In only three of these was actually of no fitting observed.

I was able to obtain all the information required for 73 out of the 88 cases in which there was an inadequate fit. Bilateral placement of electrodes was used in 36 of these and unilateral placement in 37 cases. I eliminated the three applications which resulted in missed fits from further analysis leaving 70 applications of ECT resulting in short duration seizures.

The most noticeable finding was that in 41 of these 70 cases of short duration seizure, the patients were receiving benzodiazepines or carbamazepine or both. One patient received 20 mgm per day of diazepam and 400 mgm per day of carbamazepine during the whole of the two week period during which five applications of ECT were given resulting in one missed fit and four short duration seizures.

Of the remaining 29 (out of 70) I looked for any changes in medications which could account for the

short duration seizures. Four were first applications in the course and 13 were following an immediately previous short duration seizure also. This leaves 12 cases in which the short duration seizure followed a seizure of duration longer than 15 seconds. Of these 12, 6 had received propofol on the short duration seizure but had received thiopentone or methohexitone on their previous adequate duration induced seizure. One patient was changed from methohexitone 70 mgm to propofol 100 mgm and another patient was changed from methohexitone 75 mgm to propofol 40 mgm. Two other patients were given increased doses of the same anaesthetic (thiopentone increased from 175 to 200 mgm and thiopentone increased from 250 mgm to 300 mgm) on the occasion of their short duration seizure. In four cases the anaesthetic was reduced in dosage or left unchanged and there were no other changes in the medications to account for the short duration of induced seizure.

Regarding the results of the total of 33 courses of ECT, the observation of bilateral induced fitting of at least 15 seconds duration was the criterion examined to label an induced fit as adequate. The number of adequate induced seizures ranged from 0 to 15 with a mean of 4.2 per course.

I examined the case notes of these patients following the course of ECT and categorised their outcome as follows:

- (a) recovered and discharged from hospital within 14 days of last application of ECT
- (b) marked improvement in symptoms recorded in case notes but patient not discharged from hospital within 14 days of last application of ECT
- (c) some improvement in symptoms recorded
- (d) course of ECT stopped due to lack of response
- (e) course of ECT stopped due to complications
- (f) course of ECT stopped for other reasons.

In six cases the course of ECT was stopped due to (e) or (f) and those were eliminated from further study. Outcomes (a) and (b) were grouped together as a good response and outcomes (c) and (d) as a poor response. Fourteen patients had a good outcome and 13 a poor outcome. There was a marked difference in outcome depending on whether the course consisted of less than five adequate duration induced seizures or five or more adequate duration induced seizures:

	Outcome	
	Good	Poor
Number of induced seizures of 5 or more	12	5
duration greater than 15 seconds 4 or less	2	8

The outcome was analysed according to whether the patients received a complete course of unilateral or bilateral ECT. Five of these 33 people had a mixture of bilateral and unilateral ECT, 16 had bilateral only and 12 unilateral ECT only. Fourteen people had complete courses of bilateral ECT with outcome ratings of 1, 2, 3 or 4, and 9 had unilateral ECT with those ratings. The outcome is shown as follows:

		Outcome	
		Good	Poor
Bilateral			
Number of induced seizures of duration greater than 15 seconds	5 or more	6	4
	4 or less	1	3
Unilateral			
Number of induced seizures of duration greater than 15 seconds	5 or more	4	0
	4 or less	1	4

Comment

There are flaws in the methodology of this study. Simple observation of seizure activity was used to measure the duration of fits. The Royal College of Psychiatrists' recent publication on the practical administration of ECT (1989) recommends that simple observation is probably reliable in most cases. The 'cuff technique' should give more reliable duration measurements but was not used in any of these patients.

The inclusion of an induced seizure was based on the records of ECT applications made by junior doctors in the case-notes who often timed the seizure in seconds but, in some cases, comments such as 'short' or 'relaxed' or 'adequate' fit were used. In this study seizures described as short, unilateral or no fitting observed plus those timed at less than 15 seconds duration were included but not those described as 'relaxed'. Obviously various junior doctors may have had differing ideas on what constituted a 'short' fit or a 'relaxed' fit. At the time of this study there were no guidelines given to measure the duration of induced seizures or when to start timing the seizure, i.e. from time of pressing the button, from beginning tonic phase, or beginning of clonic phase.

During the study period, the anaesthetist involved in the ECT procedure changed from the same anaesthetist to a rota system involving non-consultant anaesthetists. The original anaesthetist used thio-

pentone as the anaesthetic agent but, since the change-over, patients have received up to three different types of anaesthetic agents (thiopentone, methohexitone and propofol) during their course of ECT. There is evidence that propofol lessens the duration of induced seizures when used as the anaesthetic for ECT and Simpson & Snaith (1989) have advised that propofol should not be used as the anaesthetic agent for ECT.

Superficially the outcome results show a strong relationship between good response to ECT and having had at least five induced seizures of at least 15 seconds each. This relationship seemed particularly strong for those patients who received unilateral ECT. However, this is a retrospective case-note study and there was no standardised measure of the severity of depressive symptoms before or after the course of ECT. I devised the scoring system and may have been biased as I knew how many adequate duration fits each patient had before I gave the outcome score. The patients also suffered from a range of disorders, not just endogenous depression.

The most significant findings in this study were the relationship between short duration induced seizures and concurrent administration of benzodiazepines (Standish Barry *et al* 1985) and the relationship between longer duration of induced seizures and good clinical outcome. It would be useful to extend this study by repeating it using standardised measures of level of disturbance before ECT, more accurate measures of duration of induced seizure and standardised measures of improvement afterwards.

Recommendations

- Psychiatrists should be fully aware of the implications of prescribing benzodiazepines or carbamazepine to patients who are receiving electroconvulsive therapy.
- Anaesthetists should be aware of the shortening of duration of induced seizures when using propofol as the induction agent for electroconvulsive therapy.

References

- ROYAL COLLEGE OF PSYCHIATRISTS (1989) *The Practical Administration of Electroconvulsive Therapy (ECT)*. London: Gaskell (Royal College of Psychiatrists).
- SIMPSON, K. H. & SNAITH, R. P. (1989) The use of propofol for anaesthesia during ECT. *British Journal of Psychiatry*, **154**, 721–722.
- STANDISH BARRY, H. M. A. S., DEACON, V. & SNAITH, R. P. (1985) The relationship of concurrent benzodiazepine administration to seizure duration in ECT. *Acta Psychiatrica Scandinavica*, **71**, 269–271.