

# Editorial: Is Electroconvulsive Therapy a Therapy with Future?

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Although it was introduced almost 60 years ago, ECT still plays a key role in the treatment of severe depression. Recent clinical research has sought to refine treatment technique so as to: 1) achieve an optimal balance between antidepressant efficacy and cognitive adverse effects; 2) address the specific problems posed by elderly, medically ill patients; and 3) develop adequate measures for the prevention of relapse in patients have responded.

## Optimizing the Clinical Administration of ECT

When ECT is used as a first line treatment for depression, the response rate is in the range of 80% - 90%. Among non-responders to antidepressant medication, efficacy may be as low as 50% - 60%. Cognitive adverse effects remain the most important negative consequence of ECT. Although they resolve within 6 - 8 weeks, their negative impact on public attitudes to ECT is considerable. Accordingly, treatment modifications which improve efficacy and reduce adverse effects are an important priority.

## Stimulus Waveform

It has been clearly shown that unmodified sine wave stimulation is associated with considerably more severe cognitive adverse effects than brief pulse stimulation. Consequently, all contemporary ECT devices employ a constant current, brief pulse waveform.

## Electrode Placement

The majority of studies comparing unilateral (UL), non-dominant (right) and bilateral (BL) electrode placement have found a lesser degree of cognitive impairment with UL placement. In terms of antidepressant efficacy, studies which administer UL treatment at a higher electrical dose have been more likely to find this placement equivalent to BL.

A study<sup>1</sup> which controlled for electrode placement as well as stimulus intensity showed that UL ECT administered at a high electrical dose (relative to the seizure threshold of each patient) was inferior in outcome to both low and high dose BL. The most rapid response was achieved with high dose BL. Low dose UL was strikingly ineffective (17% response). BL placement was associated with significantly greater cognitive deficits.

<sup>1</sup>Sackeim H. A. et al.—New England Journal of Medicine, 1993, 328, 839-846.

It has still to be established whether UL treatment at a higher dose than administered in the Sackeim et al. (1993) study will be as effective as BL ECT but at a lesser cost in terms of adverse effects.

## Stimulus Intensity

The concept of stimulus intensity dosing in ECT is relatively new and still not universally applied. Two crucial observations underscore its importance. The first is that individual patients may vary by as much as 4 - 5 fold in their threshold for seizure induction and the second is that in the majority of patients there is a substantial increase in seizure threshold, of the order of 40% for UL ECT and 80% for BL ECT, during the ECT course. Increasing age, male gender and bilateral electrode placement are associated with higher seizure threshold but account for less than half of inter-patient variability. Higher electrical dose is associated with greater cognitive deficit. Therefore, it is logical to individualize treatment so that the patient receives an electrical dose which is sufficient to induce a therapeutically adequate seizure but does not exceed threshold by more than is required. Although still an approximation, the titration technique is the most accurate method for defining seizure threshold during the first treatment. It is not associated with a greater incidence of cognitive or cardiovascular adverse effects. Formulae based on the patient's age are also used. Subsequent treatments are administered at a moderately suprathreshold level (2 - 2.5 times threshold). It is essential to monitor seizure duration during subsequent treatments so as to detect increases in seizure threshold and alter electrical dose accordingly.

## Treatment Schedule

Schedule of ECT administration is defined by the frequency of ECT administration (usually twice (ECT x 2) or three times (ECT x 3) weekly) and the number of treatments in the series (usually 6 - 12). Cognitive adverse effects increase with frequency and number of treatments.

Lerer et al.<sup>2</sup> compared twice and three times weekly BL ECT in the context of a double blind study which balanced treatment frequency by the use of simulated ECT in the ECT x 3 group. Antidepressant response was more rapid with ECT x 3 although the schedules were equal in final outcome. ECT x 3 was associated with greater memory impairment. These results were con-

<sup>2</sup>Lerer B. et al.—American Journal Psychiatry, 1995, 152, 564-570.

firmed in a further double blind study (Shapira et al., submitted) which showed that the more severe cognitive side effects of ECT x 3 are a consequence of the greater frequency of ECT administration independent of the number of treatments administered. Unless speed of antidepressant effect is an overriding consideration, twice weekly ECT should be preferred, at least in the case of BL treatment.

### **ECT and the Medically Ill Patient**

An increasing proportion of patients referred for ECT are elderly and manifest a variety of medical illnesses of which hypertension, ischemic heart disease and other cardiovascular disorders most frequently place the patient in the high risk category. Such patients require careful evaluation and monitoring. ECT typically induces bradycardia which is due to vagal stimulation and then strong sympathetic stimulation with tachycardia and increased blood pressure. Administration of atropine immediately prior to ECT prevents the bradycardia and is generally recommended although some studies question its efficacy and safety. In hypertensive patients blood pressure should be carefully controlled. Some studies find administration of a short acting beta blocker immediately before ECT to be effective.

### **Post ECT Continuation Treatment**

Without continuation treatment the relapse rate of patients

who have responded to ECT may exceed 80%, most in the first 4 months after the series. In contemporary ECT practice, most of the patients referred for ECT are antidepressant non-responders. Continuation treatment with the same class of agents to which the patient had been refractory before ECT, has been criticized as illogical. Indeed, 50% of patients who were refractory to antidepressants before ECT relapse on these agents during the continuation phase. Novel approaches are clearly needed. Shapira et al.<sup>3</sup> found that 6 month survival without relapse was 65% in patients who were continued on lithium after responding to ECT. Continuation ECT is an alternative for patients with a strong history of relapse. Its efficacy and safety have been supported by small studies.

### **Conclusion**

There is still no viable alternative to ECT for patients with depressive illness which has not responded to antidepressant drugs but requires rapid treatment. Careful attention to the findings of recent clinical research can increase the safety of the treatment and enhance its efficacy.

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<sup>3</sup>Shapira B. et al.—Convulsive Therapy, 1995, 11, 80-85.