

References

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Failure to Convulse with Electroconvulsive Therapy

SIR: Replying belatedly to this report by Sharpe and Andrew (*Journal*, January 1988, **152**, 134–136), I would like first to ask why their electrodes are soaked for 30 seconds? I suggest that they would have fewer failures if they ensured soaking of at least 30 minutes.

But to return to the basic problem of the ECT-resistant patient: the simple answer for 25 years has been inhalent convulsant therapy with flurothyl (Indoklon). I still have a small supply, but this preparation is no longer manufactured. I have for some little time been trying to get production re-started, although the Ohio Chemical Company no longer exists. The main reason for this therapy falling into desuetude was the unreliability (less so with great care) of the face-mask contact, which I hope to resolve – perhaps using a more concentrated mixture.

A case in point: a few months ago I was called in by a colleague to consider planning a course of ECT for one of his patients. The patient failed to respond on seven consecutive occasions with three different machines, but, switching to flurothyl, we achieved a fully successful programme with satisfactory outcome.

If anyone is interested I have a tape made here last year; the original study was reported by Rose & Watson (1967).

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Depression in Adolescents and Young Adults

SIR: Klerman (*Journal*, January 1988, **152**, 4–14) proposes an increase in depressive illness in adolescents and young adults to explain recent studies. He also mentions an increase of depression in children. What he is describing is the unexplained phenomena of the symptomatology of minimal brain dysfunction or attention deficit disorder (ADD), which always contained signs of depressed mood being ascribed to depressive illness. The overlaps of depressive illness and attention deficit disorder according to DSM-III criteria has been repeatedly documented.

A child with attention deficit disorder, experiencing continual social and academic failure, has good reason to feel depressed. This does not warrant a diagnosis of depressive illness.

All children or adolescents with behavioural difficulties have depressive symptoms. Their parents frequently suffer from the same genetically transmitted instability, and for the same reason present intermittent symptoms of depression. The majority of suicide attempters are overreactive, labile, and impulsive, the traits associated with ADD. Unfortunately, they are treated with antidepressants at full dosage, experience unpleasant side-effects, and do not return for further treatment. Most of these individuals achieve greater stability with small doses of antidepressants (Huessy & Wright, 1970). But this positive response to tricyclics, in small doses with immediate improvement, cannot be used as an argument for the diagnosis of depression. The immediate response to small doses represents a biochemically different response from the one seen to bigger doses over three weeks in major depressive illness.

Since 13% of all children suffer from identifiable problems of overreaction, lability, and impulsivity, and since these childhood problems turn out to be lifetime problems, there are many more young adults with depressive symptoms secondary to their lifelong problems of instability than there are individuals with major depressive illness. We have compared adults with depressive illness with patients with the adult form of childhood behavioural disorders, and documented how they differed in drug response and family history (Huessy *et al.*, 1979). Both types met DSM-III criteria for major depression.

It is this diagnostic confusion which lies at the basis of Dr Klerman's discussion and which is leading to unfortunate contamination of recent epidemiological studies.

Patients with major depressive illness have 'clean' childhood histories. Adults with behaviour disorders have problem childhood histories and family histories. Since, numerically, there are many more of the

latter, their pathological childhoods and family histories will dominate the results.

Childhood depression was almost unknown. It now has become the most popular diagnosis. The patients have not changed. In 1400 consecutive admissions (spanning 11 years) of children under 18 years of age to the only psychiatric in-patient service serving a population of 400 000 in northern New York State, only 25 were diagnosed as suffering from primary depressive illness. Over 80% showed symptoms of depression and responded with improved self-control to small doses of antidepressants. They will grow up to be adults with many varied problems, and their family histories are full of pathology, but they do not suffer from major depressive illness.

The picture is further confused by the different natural history of behaviour disorders in males and females. Problems commonly begin by the age of seven in males, but only after puberty in females. This probably accounts for the different prevalence of the adult diagnoses of sociopathic, histrionic, and cyclothymic personality in the two sexes. These patients can often meet the criteria for the DSM-III diagnosis of major depression.

The issue raised by Dr Klerman is of great importance and will need much further research.

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Comparison of Electrical Measurements on Constant Voltage and Constant Current ECT Machines

SIR: The study of stimulus parameters and the effects of stimulus variables on the induced seizure and efficacy of treatment are essential prerequisites to a fuller understanding of mode of action and optimisation of treatment. The paper by Railton *et al* (*Journal*, August 1987, **151**, 244–247) is a welcome contribution to the sparse literature. We agree with the findings that, with properly standardised methods of

application, variation in electrode resistance is in fact quite small, unlike that reported by Gordon (1982) (McClelland *et al*, 1987).

However, we have a number of reservations about the reported findings and their interpretation. Dr Railton *et al* state that the energy values for the constant voltage machine were calculated using the assumption that the sign wave of the stimulus was truncated at the peak value. From our own experience of the Duopulse Mark 4 and from the observations of the authors (Fig. 2a of their paper) this is not so. The time domain waveform is in fact 40% clipped, which significantly affects the energy content of the stimulus. The authors calculate the energy (E) for the constant voltage machine using the formula

$$E = 0.25 \times V_p \times I_p \times \text{time}$$

(where V_p is the peak voltage and I_p the peak current). This is only correct for a 50% clipped waveform. The energy in a 40% clipped sine wave must be calculated using the true RMS voltage (V) of the waveform, and is found by the equation

$$E = V^2/R \times t$$

The energy estimated by the authors for the constant voltage stimulus shown in Fig. 2 (a) is 54 J assuming a current of 750 mA in the diagram. Using the correct method, the energy delivered is 76 J, an error of approximately 30%. Therefore the energy delivered by the constant voltage device is approaching twice that delivered by the constant current stimulus unit (37 J average).

While the authors report no significant difference in outcome, the measures used were extremely crude, namely whether or not patients were discharged from in-patient care 3 months following treatment. Studies of efficacy require more precision in measurement, embracing symptom ratings, the number and characteristics of treatments, and a careful monitoring of side-effects. No mention of side-effects was made by the authors.

The evoked seizure in electroconvulsive therapy depends on an adequate current applied for a sufficient period of time. The constant current device ensures a stable current within a wide range of inter-electrode impedances. One reason for introducing the constant current device has been to reduce current dosage to near threshold in order to minimise side-effects. A major difficulty with the constant voltage device is the effects of impedance variation on the delivered current for a standard voltage. If the applied voltage is reduced to nearer threshold conditions, then such impedance variation will result in missed seizures or brief seizures.