

## REVIEW ARTICLE

# Convulsive Therapy — A Critical Appraisal of its Origins and Value

PETR SKRABANEK, PhD.

Department of Community Health, Trinity College, University of Dublin.

The subject of electro-convulsive therapy (ECT) has been rarely discussed in a rational, impassive manner; it tends to polarise discussants into the apologists who turn a deaf ear to any criticism and the denouncers who do not bother to acquaint themselves with the facts. This review is an attempt at an impartial and critical assessment of the evidence for the therapeutic value of ECT and the rationale for its use.

The common tendency to disown the origins of modern convulsive therapy and to dissociate it from its past creates new myths and obscures the unchanging empirical basis of the treatment. Historical analysis provides us not only with the sources of instinctive revulsion the anti-ECT activists feel about ECT, but also with the precedents of ECT abuse. Excesses and abuses of ECT, which are bound to occur in the absence of strict ethical guidelines, only supply further ammunition to the campaigners for the abolition of ECT. Analysis of the reasons for ECT abuse is essential if ECT is to survive as a treatment modality with a limited potential in selected cases.

Since ancient times there have been two fundamentally different approaches to the therapy of mental disease: somatotherapy and psychotherapy. This therapeutic dualism betrays persistent uncertainty as to whether mental disease is due to a sick mind or a sick brain. The predilection for one or the other mode of treatment, or for a mixture of both, is determined by the attitude of the therapist to the dichotomy of the mind and the brain. Paradoxically, terror and fear, used in the past as a form of brutal psychotherapy, was invoked by the pioneers of the modern convulsive therapy (a form of somatotherapy) as a possible explanation of its effectiveness.

Fink, in an attempt to defend the current use of ECT against emotional and uninformed criticism, was at pains to stress that neither electricity, nor "shock", nor convulsions are necessary, since epileptiform brain discharges can be triggered chemically, shock abolished by anaesthesia, and convulsions made invisible by muscle relaxant.<sup>1</sup> While the modified method of administering ECT precludes the patient remembering the procedure and is less upsetting for the attendant staff, the brain is "shocked" in exactly the same way to exactly the same extent. It is only the epiphenomena of the electro-shock which have been removed. By modifying ECT, the method has become a part of the armamentarium of bio-

logical psychiatry, since the possible psychological effects of the fear of older forms of convulsive therapy have been virtually eliminated. The term electroplexy, recommended by some psychiatrists as a less frightening label, has a euphemistic value only for those who do not know any Greek.

### Historical perspective

It has been repeatedly observed and noted that severe psychological or physical shocks can result in recovery from insanity, and the history of psychiatry abounds with weird examples of such treatments. Ackerknecht pointed out that some of the old methods were so drastic that their comparison with 20th century shock therapy is appropriate.<sup>2</sup> Modern convulsive therapy followed in the wake of pyroshock treatment of general paralysis of the insane, and subsequent attempts to treat mental disease with toxic shocks, anaphylactic shocks, transfusion shocks, using injections of metal salts, foreign proteins, infective material, animal blood, etc.<sup>3,4</sup>

It is often said that ECT has proved its usefulness, despite the lack of an acceptable theory as to how it works, as testified by psychiatrists who use it. This amounts to a tautology. The same claims have been made for all the unproven therapies of the past, such as bloodletting, which produced great cures till they were abandoned as useless. It is not long ago since insulin comas, metrazol shocks, and ECT were treatments of choice for schizophrenia. But even the quondam advocates of shock therapy, Sargant and Slater, said about it: "early satisfactory results in schizophrenia, some of them brilliant, have not maintained themselves with time."<sup>5</sup>

### The role of terror in treatment

Terror as a therapy for insanity has been used since antiquity. Gaub in *De Regime mentis* (1763) mentions that "chance first taught physicians that a headlong fall into the sea or submersion in water, employed in ancient times against rabies, is of great help against many [mental] diseases", and this has been confirmed by experience. The inhabitants of Lyons showed Borrichius, during his travels in France, a lofty site from which the insane were thrown headlong into the Rhône and repeatedly drawn out on a line in order to teach them sense again, this measure having been adopted for its good results and not as a punishment. Helmholt testifies that with this bold measure the English physician Robertson restored the use of reason to many insane

persons. "The entire effect, great as it is, is not in the least due to some peculiar virtue of water, but solely due to the precipitation of the mind into the depth of terror and anguish as a result of the threat of suffocation. What is needed, then, is a machine that will inspire extreme terror, and a submersion of such duration and frequency that life itself is put in hazard and doubt arises when the man is withdrawn whether he is quite dead or can still be revived; otherwise nothing fully effective is to be awaited."<sup>6</sup>

Sudden ducking of patients was abolished by Pinel and Esquirol,<sup>2</sup> but the idea of a beneficial effect of psychological shock and terror in the treatment of insanity has not been abandoned. "It has been the idea for ages that insanity might be cured by sudden shocks, and this belief led in former times to great abuses."<sup>7</sup> "The physical shock has occasionally been known to produce a good moral impression."<sup>8</sup> "In some continental asylums the patients were chained in a well, and the water was allowed gradually to ascend in order to terrify the patient with the prospect of inevitable death."<sup>9</sup> The pit-and-pendulum methods being abandoned, patients were treated with cold-water douches. Forbes Winslow reviewed a case of death under shower in a pauper patient on whose head 20-40 gallons of water fell every minute for half an hour, and commented with acerbity: "The difficulty will be to persuade the public that the baths were not used as a quasi-punishment."<sup>10</sup> On special rotatory machines used in most British asylums, "instant discharge of the content of the stomach, bowels, and bladder, in quick succession" could be readily achieved.<sup>9</sup>

These examples of terror treatment are more than of historical interest; they form the relevant background for our understanding of the tradition and rationale underlying the introduction of modern convulsive therapy. Many psychiatrists believed (and some of them still do) that the element of fear involved in shock therapies is itself therapeutic. "Psychiatrists repeatedly stated that if a patient is threatened with death and annihilation all 'imaginary' symptoms will disappear and efforts will be made on the part of the organism to protect itself."<sup>11</sup> The "feeling of horror" before the onset of convulsion after the injection of camphor, metrazol, triazol, picrotoxin, ammonium chloride, and other convulsants, caused a "real dread" of such treatment.<sup>12</sup> "Patients beg not to be treated....they implore physicians and nurses."<sup>13</sup> "The majority soon grows to fear the injections and a few reach a pitiable state of apprehension and alarm."<sup>14</sup> "It is not altogether excluded that this very anxiety and fear might possibly be just as important as the other phases of the convulsion... The various fears and forebodings inherent in the psychoses become prominent when the patient is led or dragged into a room where several persons await him..."<sup>11</sup> The "feeling of impending death," "sinking slowly into the hole," "extreme fear" — these are descriptions of patients' reactions used by the advocates of the shock treatment. "The use of cardiazol shocks...sometimes appear to us

to be comparable to an explosive which makes a breach but at the same time may produce damage so far not well defined... We heard our patients objecting violently to the anticipated attack and vainly exerting all their will-power to fight it off."<sup>15</sup>

The patients' views are rarely included in these accounts. One patient was quoted as saying: "They (the injections) make me feel as though a great big policeman was jumping on top of me."<sup>14</sup> Although unmodified ECT was introduced as a humane improvement on the earlier versions of convulsive therapy, patients felt that they were "going to the electric chair," to be "burnt crisp" and to "never wake up."<sup>16</sup> Subsequent modifications introduced new terror: patients given muscle-relaxants without anaesthesia complained bitterly of the terrifying feeling of suffocation and paralysis.<sup>17</sup> Even though the element of terror has been eliminated from the present practice of ECT, many patients are still afraid of it. Freeman and Kendell<sup>18</sup> asked their patients what they thought about modern ECT: 39% thought it was a frightening treatment to have and another 16% did not know (perhaps they did not want to disappoint their psychiatrists). However, it is unlikely that fearful anticipation contributes to the effect of ECT in severely depressed and withdrawn patients.

#### **Dehumanising effect of shock treatment on psychiatrists**

Fink admits that the catalogue of the misuses of ECT is depressing, but suggests that it is the abusers and not the instrument which is guilty.<sup>19</sup> This is undoubtedly true. In the same way, surgery should not be blamed for vivisection excesses. Unfortunately, the instrument alone allowing the operator to "zap" the patient by pressing a button tends to dehumanise some of its users.

The layman's reaction to ECT is understandable. Even Cerletti, when his first patient shouted: "Not again: It will kill me!" was frightened and thought that ECT should be abolished,<sup>20,21</sup> though soon later after the novelty of the experience wore off, Cerletti used ECT indiscriminately. Similarly, when Meduna selected his first patient in a state hospital for cardiazol shock and witnessed the effect, his legs gave way, he trembled, was drenched in sweat, and his face turned ashen grey.<sup>22</sup> A few years later he speculated that camphor convulsions, already abandoned because they were preceded by a state of "anxiety and panic associated with assaultive and suicidal behaviour" could be used experimentally on human subjects for "studying the phases of the seizure" because the camphor-induced convulsion develops as in a slow-motion picture.<sup>15</sup> Unfortunately there were "doctors" who did this type of experiment on prisoners. The staff of the Psychiatric Institute at the University of Illinois studied metrazol convulsions in male and female patients who had to undress completely for the procedure. The convulsions of the naked patients were filmed for a further "study" by the "researchers."<sup>13</sup>

Greenblatt recalled how during his training he "was allowed to inject (Metrazol) into chronically ill patients at Worcester State Hospital in Massachusetts against their terrified and frightened resistance, which...was overpowered by several burly attendants."<sup>23</sup>

Dehumanisation is also shown in the language used: "As was our custom with dogs... we fixed the electrodes on the selected patient;"<sup>21</sup> "a convenient mouth gag is provided by a dog's rubber bone."<sup>5</sup> The lack of moral sense in Cerletti's days can be illustrated by the fact that he obtained permission to experiment on pigs in a slaughter-house,<sup>21</sup> but he did not bother to obtain permission to experiment on the first human victim.

Levenson and Willett discussed unconscious attitudes of therapists about ECT, which include the fantasy of omnipotence, and the fantasy of killing and resurrecting the patient; they pointed out that "ECT may seem like an overwhelming assault or a sexual act, which may resonate with the therapist's aggressive and libidinal conflicts."<sup>24</sup>

Following the memorandum on ECT by the Royal College of Psychiatrists,<sup>25</sup> the editor of *The British Journal of Psychiatry* accused a consultant of being "inhumane" in administering ECT without asking the patient or the relatives.<sup>26</sup> A few years later, Pippard and Ellam showed that this was a common practice in Britain.<sup>27</sup> However, the consultant who was attacked, rightly argued that it was illogical to ask for consent and to proceed to give ECT, notwithstanding a refusal, as recommended in the memorandum.<sup>28</sup>

The use of ECT by force is constantly being justified by psychiatrists on "humanistic" grounds. This itself is an indication of dehumanisation. Those who disagree with them tend to be described as "maverick psychiatrists" who do not see that "patient's refusal or inability to consent to treatment is itself a symptom of his disease."<sup>29</sup> One of the advocates of compulsory ECT expressed it in the following circular argument: "If necessary, I should want ECT given against my will." Salzman was correct in suggesting that ultimately civil libertarians and the public must be included in discussions attempting to set ethical guidelines for the use of ECT.<sup>30</sup>

The practice of ECT administration in Great Britain was described as "deeply disturbing" by a *Lancet* editorialist.<sup>31</sup> Attendant staff is generally hostile to ECT<sup>27</sup> and view the procedure as controlling and punishing the patients.<sup>24</sup> The report on the abuses of ECT in the St. Augustine Hospital in Canterbury contains accounts such as: "a patient in a depressed state was refusing to have ECT...three nurses went to fetch him and half-dragged half-carried him...struggling and pleading."<sup>32</sup>

Nine signatories accused the media of falsely presenting ECT by "some ancient film of straight ECT from the days of Cerletti and Bini."<sup>33</sup> They

admitted implicitly that not all was fair in the old days. A few years ago a scandal erupted in Britain after the discovery that unmodified ECT was used in Broadmoor Hospital to "control" patients' behaviour. This was defended by the President of the Royal College of Psychiatrists and by others.<sup>34,35</sup> The *Lancet* commented that "the cuckoo's nest may not be as empty as we supposed."<sup>34</sup>

For most patients the threat of being put on the shock list has the instant effect of bringing their conduct into line.<sup>36</sup> In a Vietnamese hospital under U.S. control, the whole ward of male patients were given the option to work or to get straight ECT. It was not clear how many ultimately opted for work because of the fear of ECT, but the "mass treatment" worked. In the female ward, shocking patients into work did not achieve its objective, despite 20 shocks per person, but starving them for 3 days was successful. Dr. Cotter, who carried out these "behavioural modifications" expressed the opinion that "inflicting a little discomfort was well justified."<sup>37</sup> Since this type of report appears in the official psychiatric journals, one may be forgiven for doubts whether psychiatrists alone are able to maintain self-discipline among their ranks.

In Britain, black mental patients are more likely to receive ECT than the whites.<sup>38</sup> Again and again, the use of ECT as a means of controlling behaviour, against the wishes of the patient and the family, is advocated.<sup>39</sup> With the instrument at hand, a button inviting to be pressed, and the unlimited power to use it, the moral corruption of its users is inevitable. Most scandals of ECT abuse are brought to light not by psychiatrists involved or their colleagues, but by auxiliary staff, or the patients themselves. "It is not ECT which has brought psychiatry into disrepute. Psychiatry has done just that for ECT."<sup>31</sup>

In the past, psychiatrists did not draw a sharp line between treatment and punishment. Cameron of the Midlothian District Asylum in Edinburgh used hyoscyamine to teach patients good behaviour. "The patient lies in a state of profound coma, with swollen livid features, widely dilated pupils, and slow, stertorous, almost convulsive breathing... One remarkable feature in the effects produced by hyoscyamine... is the extreme repugnance with which it is regarded by all who have experienced its effects... It is of wonderful efficacy in some cases of persistent mischievous behaviour."<sup>40</sup>

#### Empiricism of convulsive treatment

Sakel, Meduna, and Cerletti, the fathers of modern shock therapy, were no scientists. Their writings are characterised by muddled thinking, bizarre theorising, and egocentric striving for fame. They discovered no new principles of treatment and no new understanding of psychoses. The common denominator of their therapeutic efforts was the ancient notion of shocking patients back to sanity. There is a streak of cruelty in their use of patients to advance their own fame. It was the Zeitgeist of the late thirties (so accurately



captured by Karl Kraus in *Die Dritte Walpurgisnacht* in 1933) which allowed and applauded the revival of shock therapy in mental asylums. It is hardly a coincidence that the convulsive therapies and psychosurgery all emerged and gained a wide acceptance in the years 1935-1938.

Sakel from Vienna was the most naive of the three. Using insulin as a sedative in the treatment of neurotics and morphinists, he observed that accidental overdosage of insulin resulted in epileptic fits or coma. Those who survived were "psychically improved." "I began with addicts...I observed improvements after severe epileptic shocks...Those patients who had previously been excited and irritable, suddenly become contented and quiet after these shocks... The success I had achieved in treating addicts and neurotics... encouraged me to use it in the treatment of schizophrenia or major psychoses."<sup>41</sup> In 1938, Sakel felt that insulin coma ("wet shock") could be improved by chemically-induced seizures ("dry shock"), since spontaneous convulsions after insulin were unpredictable. He experimented with strychnine, camphor and cardiazol. As he saw it, "the epileptic fit is the artillery, the hypoglycaemia is the infantry in the battle against the disease."<sup>42,43</sup> Joseph Wortis, who acted as Sakel's interpreter, recorded that, according to one critical observer, Sakel "spun some really fancy theories...naive mixture of physics, chemistry, physiology, and circumlocution."<sup>44</sup>

Meduna, experimenting independently on patients in a Hungarian state mental asylum, was influenced by his chief, Professor Nyirö, who previously tried (unsuccessfully) to cure schizophrenia by injections of blood from epileptics. The first Meduna's experiments (camphor-induced shocks) were a repetition of the 16th century treatment for lunacy by Paracelsus. Meduna attacked Sakel's method as lacking a sound theoretical basis.<sup>45</sup> For a short period, Meduna defended the use of chemically-induced epileptic convulsions by an antagonism between schizophrenia and epilepsy. He believed that the equilibrium between mesoderm and ectoderm was disturbed both in epilepsy and schizophrenia, but in opposite directions.<sup>45</sup> This nonsensical theory was abandoned by Meduna one year later, when he finally admitted that it is the "shock" which matters. He suggested that his method is like "water-shock" therapy in uraemia in that shocking the brain of a schizophrenic stimulates "a sluggishly reacting organ to maximum effort."<sup>46</sup> While Sakel thought in terms of bombardment of the brain, Meduna spoke of "dynamite, endeavouring to blow asunder the pathological sequences... We are undertaking a violent onslaught...because at present nothing less than such a shock to the organism is powerful enough to break the chain of noxious processes that leads to schizophrenia."<sup>45</sup>

Others thought that the main effect of convulsive therapy was "to knock out, transiently or permanently, diseased nerve-cells which are less resistant than healthy cells."<sup>12</sup> The vocabulary has been borrowed from cancer treatment.

Mental disease was a cancer of the mind, or rather, of the brain.

Cerletti discovered nothing, since he started to use electrically-induced fits only after epileptic treatment of schizophrenia had been promoted by Sakel and Meduna. Cerletti himself stated that "except for the fortuitous and fortunate circumstances of pigs' pseudo-butchery, electro-shock would not have been born."<sup>21</sup> This is not accurate, since at his time there was an extensive literature on induction of epilepsy by electric current (reviewed for example by Ward and Clark<sup>47</sup>).

Galvani's nephew, Aldini, was reported to have cured two cases of melancholia by passing galvanic current through the brain in 1804.<sup>48</sup> In England, Clifford Allbutt in 1872 used the passage of electric current through the head for treatment of mania, brain-wasting, dementia and melancholia.<sup>49</sup> In 1876, Savage recorded that melancholia improved after an epileptic fit. In 1885, de Watteville wrote that "the application of electricity to the treatment of insanity is, I am happy to observe, beginning to occupy the attention of alienist."<sup>50</sup> The first experiments in inducing epileptic fits by direct needling of the brain with an electrode (in an Irish immigrant to the USA) were carried out by Bartholow in 1874.<sup>51</sup> The history of the use of electricity in treatment of insanity is reviewed by Harms<sup>52</sup> and Mowbray.<sup>53</sup> Löwenfeld achieved induction of epileptic fits by passing electric current through the head of his mental patients.<sup>54</sup> The idea was old and primitive. "It is said that the Abyssinians make use of the torpedo for the cure of fevers. They tie the patient on his back on a table and apply the fish to all parts of the body. The operation is attended with extreme torture, but they pretend that it carries off the disease," as recorded in 1796.<sup>55</sup>

The bizarre experimentation of Cerletti can be illustrated by his "discovery" that mental patients improve remarkably after injection of brain matter from animals treated with electro-shock. Cerletti advocated the method of "annihilation" introduced by his colleague, Bini, in 1942, which consisted in giving a series of ECT many times a day for many days.<sup>21</sup> This reduced the patient to a vegetable state. Patients became incontinent and they required artificial feeding. Cerletti observed that the annihilation method gave "good" results in obsessive states, in psychogenic depression, and even in paranoid states.<sup>21</sup> Ten years ago this method, under a euphemism of "regressive ECT," was still advocated by some American psychiatrists.<sup>56</sup>

Cerletti believed that he had discovered a panacea: he reported ECT as successful in toxicomania, progressive paralysis, Parkinsonism, disseminated sclerosis, asthma, psoriasis, itch, oozema and alopecia.<sup>21</sup> His followers used ECT to "cure" homosexuals.<sup>12</sup> As pointed out by Cook,<sup>12</sup> there was more than a touch of irony in the fact that convulsion treatment, introduced as a specific measure against schizophrenia was found



to be specific for affective psychoses. ECT is still used in anorexia nervosa, obsessional illnesses, organic confusional states, and psychogenic pain, without any rationale.<sup>57</sup> A recent survey of the usage of ECT in Massachusetts found that in 1980 in general hospitals, 42% of ECT administrations were in "dysthymic disorder" (which includes depressive neurosis) and only 16% for major depression.<sup>58</sup> Mills et al. thought that at least 20% of patients received ECT for inappropriate indications.<sup>58</sup> It is quite clear from the current psychiatric literature that there is no agreement on what are the appropriate indications. This is not surprising considering the empirical nature of the treatment lacking any explanation why it should work.

### Does ECT cause brain damage?

This contentious issue is confounded by several misunderstandings. Firstly, the notion of brain damage was not introduced by the critics of convulsive therapy but by its advocates. Secondly, there is no dispute about ECT causing an acute brain syndrome — the question is whether this "damage" has permanent consequences, and if so, how often and to what degree? Thirdly, no one disputes that ECT impairs memory, but again, the question is one of the type, severity, and duration.

Templer compared appropriately this issue with the debate about the effect of boxing on the brain: "ECT is not the only domain in which damage to the human brain is denied or deemphasised on the grounds that this damage is minor, occurs in a very small percentage of cases, or is primarily a matter of the past."<sup>59</sup> In fact, nearly half of the U.S. psychiatrists believe that ECT produces slight or subtle brain damage.<sup>60</sup>

That insulin coma or metrazol shock can cause brain damage was realised early in the history of convulsive treatment and in the discussion to Weil's paper, Dr. Roy Grinker asked in 1938: "Does shock therapy improve schizophrenic patients by structural damage of a less intense but more diffuse type?"<sup>61</sup> Whether there was a therapeutic value in a certain amount of brain damage was a moot point.<sup>62</sup> Bini at the Münsingen Congress in 1938 reported that the brain damage in experimental animals treated with electro-shock was severe and widespread. "The importance of the alterations we have met so far in our animals does not permit us to exclude the possibility of applying these physical methods in human therapy... These very alterations may be responsible for the favourable transformation of the morbid psychic picture of schizophrenia."<sup>63</sup>

The most venomous criticism of convulsive therapy came from Breggin<sup>64</sup> and Friedberg,<sup>65</sup> whose evidence was based mainly on the old literature. Unfortunately, the neuropathological literature is a "morass of poorly done and largely uninterpretable studies."<sup>66</sup> In a superb review of this morass, Weiner found little evidence for permanent brain "damage," but he concluded that memory deficits after ECT do occur and some of them could be persistent.<sup>67</sup> Another abnormality which takes weeks to months to disappear and

may persist even longer in rare cases is EEG slowing.<sup>68</sup> The significance of this is not clear. More recently, Calloway and Dolan raised the question of frontal lobe atrophy in patients previously treated with ECT.<sup>69</sup>

Cook in an early exhaustive review of convulsive therapy discussed the post-ECT amnesic syndrome, which varied from "mild forgetfulness to severe confusion of the Korsakow's type," occasionally persisting for long periods.<sup>12</sup> One of the first studies attempting to quantify memory disturbance after convulsive therapy was by Tooth and Blackburn.<sup>70</sup> However, research methodologies for assessing memory deficits following ECT have been generally inadequate.<sup>71</sup> Kendell in his valuable review found the studies by Janis, Squire, and Freeman as fairly convincing that past memory can be permanently disrupted by ECT.<sup>57</sup> Squire studied patients treated with ECT for depression (i.e., given shorter courses than schizophrenics) and found that information acquired in the days and weeks prior to and just after ECT may be permanently lost. There may be patchy and permanent gaps for events in the 1-2 years preceding ECT. The disruption of recall for events that occurred many years previously recovered virtually completely within 7 months of ECT treatment.<sup>72,73</sup>

In a questionnaire administered to patients who had ECT, 28-30% claimed that their memory never returned to normal and that ECT caused permanent changes to memory.<sup>18</sup> It is possible that gaps in autobiographic memory may have therapeutic value. "Can'st thou not minister to a mind diseased; pluck from the memory a rooted sorrow, raze out the written troubles of the brain" (*Macbeth*, v, iii). In this sense, such memory loss could indeed be welcomed and denoted as "trivial."<sup>74</sup>

There is, however, a strong resistance by the advocates of ECT to accept any criticism, even when it is so meticulously fair as Weiner's. Fink accused Weiner that he "genuflects to avoid criticism" and that "such kowtowing is inappropriate."<sup>74</sup> These intemperate words were seconded by Kalinowsky, who brushed away the criticism with "no need to investigate reasons for a few dissenting voices."<sup>75</sup> The same Kalinowsky dismissed spinal compression fractures occurring during the acute anterior flexion in metrazol shocks in 40-50% of patients<sup>76</sup> as having "no clinical significance."<sup>12</sup>

Fink argues that the principal risks of ECT (amnesia and organic brain syndrome) can be reduced by hyperoxygenation, unilateral placement of the electrodes over the nondominant hemisphere, and use of minimal induction currents.<sup>77</sup> Surely if amnesia and organic brain syndrome were trivial, there should be no reason for these elaborate modifications. Moreover, these very modifications may be responsible for decreasing the efficacy of ECT as noted in several recent trials and studies.

For example, Robin and de Tissera questioned the belief that what matters is the convulsion and not the electric energy required to elicit it.<sup>78</sup> Experiments with unilateral placement of the electrodes started early in attempt to reduce confusion and memory disturbance,<sup>79</sup> but despite the repeated assurance of the equipotency of bilateral and unilateral ECT,<sup>80,81</sup> most psychiatrists have not yet been convinced.<sup>82-84</sup> It is of interest that in Massachusetts in 1980, 90% of ECT in public hospitals were bilateral, though only 39% were bilateral in private hospitals.<sup>58</sup>

### Efficacy of ECT

**Schizophrenia.** Defending ECT against public criticism, the secretary of the Society of Clinical Psychiatrists stated that "sensible people must surely realise that well-trained professionals are not going to continue administering a treatment for many years if it does not work".<sup>85</sup> In the case of schizophrenia, the well-trained professionals have been doing just that for the last 50 years. Kalinowsky still believes that insulin shocks are the best treatment for schizophrenia; his opinion is based on his experience and he dismisses controlled studies as irrelevant.<sup>86</sup> Fink believes that ECT is at least equal to other therapies in schizophrenia, and in support of his claim he quotes obsolete and subjective impressions by Kalinowsky, and Sargant and Slater.<sup>1</sup> In fact, Sargant advocated insulin coma for schizophrenia as late as 1958.<sup>87</sup>

There is no evidence that ECT alters the schizophrenic process.<sup>88</sup> Even the initial enthusiasm for convulsive and insulin treatments in schizophrenia was not universally shared. In 1939, Stalker found no difference in outcome of schizophrenia, regardless of whether insulin shocks, cardiazol shocks, or psychotherapy were used.<sup>89</sup> Meduna's compatriots found cardiazol shocks and insulin shocks worse than no treatment.<sup>90</sup> Bourne brought attention to the fact that schizophrenics treated with insulin received 50-100 times more attention by the staff than the patients not so treated.<sup>91</sup> In the first mammoth review of somatic therapies, using confidence intervals, Appel et al. found that ECT was no better than hospitalisation alone.<sup>92</sup> David found only two controlled studies on the efficacy of insulin treatment: none showed insulin better than placebo.<sup>93</sup> Ackner et al. found no difference between insulin coma and barbiturate sleep.<sup>94</sup> Leyton showed that placebo (i.v. glucose) was as effective as a course of 40 insulin comas.<sup>94</sup> Brill et al. found ECT no better than anaesthesia alone.<sup>16</sup> Riddell, reviewing the literature at the beginning of the sixties, concluded that the era of shock therapy was fast drawing to a close.<sup>96</sup> The only controlled study from recent times on the efficacy of ECT in schizophrenia was carried out by Taylor and Fleminger.<sup>97</sup> Despite their conclusion that ECT was effective in paranoid schizophrenia, no difference was demonstrable 2 months after a short course of treatment. No further improvement was observed after the initial six ECTs, which runs against the clinical lore that in average 20 ECTs are necessary in schizophrenia. The nurses and the relatives could not

distinguish between the treated and the control group. These were very unimpressive findings and it is not surprising that 60% of the US psychiatrists consider ECT in schizophrenia as inappropriate.<sup>60</sup> What is more worrying is the source of conviction of the remaining 40% who believe that ECT in schizophrenia is not inappropriate.

**Depression.** The most often quoted studies demonstrating the effectiveness of ECT in depression have been Greenblatt et al.<sup>98</sup> and the British Medical Research Council study.<sup>99</sup> One wonders how many psychiatrists read more than the abstracts of these studies. Greenblatt et al. reported that ECT was universally effective in depression, regardless of the type: 70-80% of depressed patients improved, including manic-depressives, psychoneurotics, involuntal depression, and character disorders. "There were no significant differences among any of the diagnostic groups" treated by ECT, which included also schizoaffective reactions. Placebo response at least equalled imipramine, phenelzine, and isocarboxazid. Greenblatt's study was pooled from 3 hospitals: in hospitals A and C, ECT was as good as imipramine; in hospitals B and C, ECT equalled placebo. The placebo response (markedly or moderately improved) after 8 weeks was 69%. Improvements as high as 70-80% can be expected due to placebo alone.<sup>100</sup>

In the MRC study,<sup>99</sup> at the end of 5 weeks, more male patients were discharged who received placebo than those treated with ECT. No difference was observed in male patients among the four treatment groups (ECT, phenelzine, imipramine, placebo).

In the last seven years seven controlled trials were carried out in Britain. The initial impetus was the memorandum of the Royal College of Psychiatrists<sup>25</sup> issued in response to another report of ECT abuse. The memorandum minimised the side effects of ECT and wishfully declared the evidence for ECT effectiveness in depressive illness as "incontrovertible", though it was admitted that "in depressed patients there is suggestive, if not yet unequivocal evidence that the convulsion is a necessary element in the therapeutic effect."<sup>25</sup> It was this uncertainty which the seven trials tried to resolve, using randomisation of patients to simulated and real ECT. Each trial which threw doubts on the "incontrovertibility" of the evidence was severely attacked by correspondents questioning methodology and even motives of the trialists. There were few questions asked about the methodology (usually much more spurious) of trials more favourable to ECT. One of the commentators was of the opinion that "despite all precautions, the preconceptions of the [trialists] somehow influenced their findings."<sup>57</sup>

Freeman et al.<sup>101</sup> went only one third of the way: only the first two ECTs of six were simulated in the control group. Treatment was discontinued for reasons other than satisfactory response in six of 20 in the real ECT group and in only two of 20 in

the sham ECT group. The trial was unsatisfactory. Lambourn and Gill<sup>102</sup> used unilateral ECT (simulated and real) — they found no difference. The Northwick Park trial,<sup>103</sup> considered by many as the best trial yet, showed no difference between the simulated and real ECT at one and six-month follow-up. After a four-week treatment period, the advantage of real ECT showed in only one of three rating scales used. The authors suggested that good nursing care and medical care can be equally good. This was counteracted by West,<sup>104</sup> who found real ECT superior to simulated ECT. It was not stated how the single author carried out the double-blinding procedure. The uncertainty was strengthened by the lack of any improvement in the control group during the three-week treatment period. Gangadhar et al.<sup>105</sup> compared ECT (and placebo) with simulated ECT (and imipramine); both treatments produced equally significant improvements which were maintained for the duration of 6-month follow-up. Brandon et al.<sup>106</sup> confirmed the findings of the Northwick Park trial. Both simulated and real ECT resulted in significant improvements. At the end of four-week treatment, consultants were unable to guess who received real or simulated ECT. The initial difference in favour of real ECT disappeared at 12 and 28 weeks. In the latest trial, Gregory et al.<sup>107</sup> compared simulated ECT with unilateral and bilateral ECT. After a two-week treatment period, bilateral and unilateral ECT groups improved faster than the simulated-ECT group, but there was no difference one, three, and six months after the trial. This trial is more difficult to evaluate since all groups received additional ECT after the end of the trial. The trial was marred by a high rate of drop-outs: only 64% patients completed the study and an equal number withdrew from the simulated and bilateral ECT groups.

In his thoughtful review, Crow questioned the widely held view that the convulsion is a necessary component of the therapeutic effect of ECT.<sup>108</sup> He also raised the important question whether there are certain types of depression which respond to ECT only. From the material of the Northwick Park trial,<sup>103</sup> it appears that only depressed patients with delusions responded more to real ECT than to simulated ECT.<sup>104</sup> This would narrow the indications for ECT a great deal. There was no evidence that endogenous features were sufficient predictors of response to ECT. These findings are important and should be replicated. It is, however, doubtful, whether in delusional depression, ECT should be the treatment of choice. Spiker et al. showed that in delusional depression the combination of amitriptyline and perphenazine is probably at least as good as ECT.<sup>110</sup>

The question then remains, is ECT necessary as a treatment modality in psychiatry? From the earliest times of convulsive therapy, it was recognised that the treatment is unspecific and consists in shortening the duration of the illness rather than in improving the outcome.<sup>111</sup> One of the arguments for retaining ECT is the prevention of suicides in depressed patients. The standard

reference given to support this view is the paper by Avery and Winokur.<sup>112</sup> Close reading of this report reveals that the patients who received ECT and antidepressants had a suicide rate twice that of patients who received antidepressants only. Moreover, the study shows that there was no difference between the suicide rate in patients treated with either ECT or with antidepressants. More recently, Babigian and Guttmacher<sup>113</sup> found that the duration of hospitalisation of depressed patients who received ECT was on average about twice that of those who did not receive ECT. The mortality risk for suicide was the same for both groups. ECT recipients died sooner after the first hospitalisation than patients who did not receive ECT. While these results are difficult to interpret because of the problem of selection, they do not lend support for the notion that ECT prevents suicides. Similarly, Fernando and Storm<sup>114</sup> found no significant difference in the rate of suicide between patients who received ECT and who did not. Thus, the suicide argument does not stand up.

### Conclusions

Convulsive therapy is primitive and unspecific treatment, initially based on the old belief of shocking the patient into sanity.

Recent controlled trials suggest that ECT shortens the duration of recovery in depressive illness, particularly in the delusional variety, but it is clear that the large proportion of the improvement attributed to ECT is a placebo effect or possibly the effect of anaesthesia. Undoubtedly, electrically or chemically induced seizures have a profound, but short-lived, effect on brain function (acute organic brain syndrome), which affects performance in the rating tests by which mental disease is quantified. There is, however, no evidence that these functional and biochemical changes affect specifically and fundamentally the underlying psychopathology of psychoses.

It is difficult not to accept the general consensus that ECT is a relatively safe procedure with little long-term effect. While ECT has not been shown to be superior to drugs, it must be taken into account that the side-effects of drugs are not negligible, and are often more serious than those of ECT. However, because of strong pressures from some psychiatrists to use ECT against the will of the patient or his relatives, the temptation to use ECT indiscriminately, and the inevitable abuse of ECT as a means of punishment by a small minority of irresponsible psychiatrists who wield the power to do so, the use of ECT should be restricted by law and controlled by selected bodies representing both the public and the psychiatric profession.

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