

Eighty Years of Electroconvulsive Therapy in Clinical Practice

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Despite more than eighty years of research backing up its effectiveness as a treatment for severe psychiatric disorders¹, Electroconvulsive therapy (ECT) remains a divisive topic amongst medical professionals and the general public alike². For some it represents a throwback to Psychiatry's dark past, where ill-informed and damaging treatments such as ice baths, insulin induced comas and the frontal lobotomy were administered indiscriminately and without evidence to non-consenting patients. This image is typified by its portrayal in the 1975 film "One flew over the cuckoo's nest"³. Fortunately, modern day "modified" ECT bears little resemblance to this practice and a recent functional meta-analysis published in the BMJ⁴ highlights the fact that it remains an invaluable and highly effective treatment in severe mental illness.

Developed in 1938 by Italian neuroscientists Ugo Cerletti and Lucio Bini, who noted dramatic improvements in certain Psychiatric disorders following the induction of a seizure in the patient, it was originally given as a sinusoidal electrical current and was administered without muscle relaxants. This led to particularly violent seizures that could in extreme cases cause injuries such as broken or dislocated bones. Patients also complained of memory difficulties after administration and for this reason the treatment fell out of favour significantly from 1950-1979. This also coincided with the advent of the widespread use of antidepressant and antipsychotic medication and it was felt that this treatment was outdated and was no longer needed.

A resurgence in the use of ECT from the 1980's onwards came with the realisation that many depressed and psychotic patients do not respond to medication. So called "modified" ECT meant that the patient was put under general anaesthetic during the treatment and muscle relaxants were used to prevent the injuries and discomfort historically associated with the treatment. New brief pulse techniques of administration also meant that the electrical current could be titrated to the individual patient's seizure threshold, leading to a drastic reduction in the cognitive side effects of the procedure. It became recognized that ECT remained a highly effective treatment, particularly for conditions such as severe depression, catatonia and intractable mania. Today the treatment only takes a matter of minutes, and the patient is closely monitored by an anaesthetist, a psychiatrist and a nurse who all must be present during the procedure.

Despite the image of ECT portrayed in the film and media, more than eighty percent of ECT treatments administered in Ireland today are on a voluntary basis⁵. These are patients with severe and debilitating illnesses that have not responded to medication. It is most frequently used for severe depression, where the individual might have severe disruption in sleep, appetite, may have suicidal thoughts and in extreme cases be experiencing psychotic symptoms. It is also sometimes used in other conditions such as catatonia, intractable mania or rarely for psychosis. It is generally administered 2-3 times per week for up to 10 sessions and very significant improvement in the patient's symptoms is often seen after only a few sessions. Where the ECT is voluntary the patient must give informed consent after every treatment and can withdraw their consent at any time. Patients are generally advised to stay on antidepressant treatment following a course of ECT to prevent relapse.

The use of involuntarily ECT is stringently governed in Ireland and is only considered where the patient's life is at risk and all other treatment options have been exhausted. This includes situations where the patient is catatonic and not

eating or drinking. An independent psychiatrist must assess the patient and the patient's capacity to consent should be assessed following each treatment. This decision is usually taken while taking into account numerous factors and including the views of the patient's family and loved ones. When the patient's capacity returns they can then withdraw from treatment or continue it as they wish.

One criticism of ECT is that its mechanism of action remains largely unknown. This is despite decades of research in the field which remains ongoing⁶. One of the issues is the vast array of effects that ECT has on the body, including release of various neurotransmitters, neuropeptides and hormones⁶. It is also complicated by the number of conditions with seemingly opposite clinical presentations that it is effective in treating, for example, severe depression and intractable mania. One of the most promising lines of research in recent years has established neurogenesis after ECT in animal models but this has yet to be properly tested in humans⁷.

Another often cited concern for patients and ECT critics alike is issue of cognitive deficits following the treatment. Most studies have shown at least some degree of anterograde and retrograde amnesia in the weeks preceding and immediately after treatment⁸. Of most concern to patients is the loss of autobiographical memories related to life events. Research has suggested that these deficits are temporary and can be lessened by use of high dose right unilateral rather than bilateral techniques of administration⁸. Some studies have shown that patient's memory actually improves to their pre-treatment level over time^{9,10}.

Overall, Electroconvulsive therapy remains an evidence-based treatment proven to be highly effective in the treatment of severe mental illness. It is far removed from the treatment used in the 1930's and 40's, with anaesthetics and new techniques of administration meaning that modern day ECT has good tolerability and few side effects. It is also now used mostly as a voluntary treatment requiring informed consent from the patient. While not to be viewed as a first line treatment, after eighty years of use in practice it remains invaluable for those with severe and refractory mental illness.

Declaration of Conflicts of Interest:

The authors have no conflict of interests to declare.

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