

## Electroconvulsive therapy in depressed older adults

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Depression is an illness. It is associated with a feeling of sadness that will not go away, a disinterest in life, and it might be followed by changes in sleep and appetite (Pace & Glass, 2001). It reduces people's productivity, and the mortality rate is high (Doris, Ebmeier, & Shajahan, 1999); it is estimated that 5 million Americans over 65 years of age are depressed. This represents 12% of the population, but people in this age group account for 25% of all suicides (Zal, 1999). Major endogenous depression is a depression that occurs without any obvious cause, and is often recognised by its melancholic features (Rush & Weissenburger, 1994).

Electroconvulsive therapy (ECT) is a way of inducing grand mal type seizures electronically (Fink, 2000; Kelly & Zisselman, 2000), and since its development in 1938, ECT has shown itself a safe and effective way of treating, amongst other conditions, mania and depression (Cohen et al., 2000; Kelly & Zisselman, 2000; Wharton, 1968; Zorumski, Rubin, & Burke, 1988).

ECT is used with high success-rates in both young people (Cohen et al., 2000), and older people (Kelly & Zisselman, 2000; Zorumski et al., 1988). In younger people, ECT is used to treat several types of psychiatric disorders (Kendell, 1981), but in older people it is mostly used for treating mood disorders, and then especially different kinds of depression (Fraser, 1981). Kelly and Zisselman pointed out that a disproportionate amount of ECT treatments are

given to elderly females, and suggests this might be due to medical complications that limits the pharmacological options in this part of the population.

In the geriatric population, ECT is most commonly used for treating major depression accompanied by melancholic features (Zorumski et al., 1988). Williams, O'Brien, and Cullum (1997) reported that the first ECT treatment reduced depression-rating scales by 21%. Tew Jr. (1999) reported that between 54% and 73% of elderly subjects responded to ECT, subjects younger than 59 years of age having the lowest responses. According to Zorumski et al., about 80 percent of elderly patients respond favourably to ECT. They suggest that ECT should be considered a first-line treatment for both patients who do not respond to medication, and for patients with life-threatening symptoms. Zal (1999) takes a similar approach, and recommends ECT when an elderly patient suffers from severe malnutrition or dehydration, or a psychotic depression, and for patients who do not tolerate or do not respond to drugs.

Alternatives to ECT range from psychotherapy through herbal medicine to pharmacotherapy; the latter include tricyclic antidepressants, monoamine oxidase inhibitors, and selective serotonin reuptake inhibitors (Kamholz & Mellow, 1996; Zal, 1999).

The effects of psychotherapy are much debated. For example, Chilvers et al. (2001) found that counselling is as effective as antidepressants, but this study has been heavily criticised on methodological grounds (Leung, Thornett, Curtis, Chilvers, & Dewey, 2001). In a meta-analysis of English language studies published between 1970 and 1998, McDermut, Miller, and Brown (2001) found that group psychotherapy was more effective than no treatment, however, they did not compare the efficacy of psychotherapy to other modalities.

St John's wort (*Hypericum perforatum*) has long been used in Europe for the treatment of depression (Altshul, 2001; Zal, 1999). A meta-analysis has shown it might be effective in treating mild to moderate depression (Linde, Ramirez, Mulrow et al., 1996, as cited in Zal, 1999). Zal also proposes the use of the wort *Ginkgo biloba*, as it may improve cerebral and peripheral circulation.

Selective Serotonin Reuptake Inhibitors (SSRIs) and tricyclic antidepressants (TCAs) have been shown to have high efficacy in the elderly. In one study, 60% to 80% of the subjects responded to treatment with SSRIs and TCAs (Schneider, 1996). A meta-analysis by Sparano (2000) showed that 50% of subjects responded to pharmacotherapy, versus 32% for placebos.

The Algorithm for the Treatment of Chronic Depression from The Texas Medication Algorithm Project (TMAP) lists ECT as the fourth stage of treatment, after repeated trials of pharmacotherapy and psychotherapy (Trivedi & Kleiber, 2001). The authors claim a combination of pharmacotherapy and psychotherapy is the best option for treating patients with chronic depression.

Although ECT is considered safe, there are a number of common side effects, some due to the ECT itself, and muscle-pain due to the anaesthesia used (Benbow, 1989). Side effects observed in patients of all age groups include anterograde and retrograde amnesia (Benbow, 1989; Leinbaugh, 2001; Lisanby, 2000; Weiner, 2000), and in the first few hours after treatment, patients may experience headaches, muscle aches and soreness, nausea and confusion (Pace & Glass, 2001). It has been reported that there are two to four deaths per 100,000 ECT treatments (Abrams, 1997, as cited in Kelly & Zisselman, 2000). In the elderly, dental fracture, rupture of the bladder, and cardiac complications has been reported (Benbow,

1989). Only in patients over 50 years of age did cardiac complication occur, and it was more common in those over 60. Still, Tew Jr. et al. (1999) reported that patients of 75 years and older (old-old patients) tolerated ECT just as well as adult patients (59 years or younger) and young-old patients (60 to 74 years), and that the old-old patients responded just as well and sometimes better than the younger patients, to ECT.

Event though there are several common side effects to ECT, these do not preclude its use. Further on, it is generally thought to be safe to administer ECT to patients with a wide range of medical conditions. ECT has no absolute contraindications (Hale, 1997; Kelly & Zisselman, 2000), but Kotin (1993) lists hypertension, heart diseases and patients with intracerebral masses as possible contraindications.

The presence of a brain tumour has been considered an absolute contraindication to ECT, but Kellner and Rames (1990) reported the successful ECT treatment of an elderly woman with a brain tumour. Zorumski et al. (1988) mentions “central nervous system lesion with evidence of increased intracranial pressure” (p. 645) as an absolute contraindication to the use of ECT, but goes on to cite case reports where patients with this condition successfully have received ECT.

All in all, it is important to analyse the trade-offs between risks and benefits for each individual patient (Kamholz & Mellow, 1996). Also, the patient and the patient’s family should be well aware of side effects and possible complications (Leinbaugh, 2001).

Little is known about the mechanisms by which ETC works. Nobler et al. (2001) used position emission tomography (PET) to study patients before and after ECT, and found that

several regions in the patient's brains had decreased glucose metabolism, especially in the frontal and parietal cortex. From this they concluded that ECT reduces neuronal activity in some cortical regions, and propose that this may have an anticonvulsant and antidepressant effect. However, this theory is weakened by the finding that benzodiazepines and other anticonvulsant drugs fail to ameliorate depressive symptoms (Fink, 2000).

Another theory is that ECT works by raising norepinephrine (NE) levels in the brains of patients with depression. NE is a neurotransmitter, which is known to be deficient in a number of patients with depression (Kotin, 1993). Other theories focus on different neurotransmitters, like dopamine, serotonin and gamma-amino-butyric acid (GABA) (Fink, 2000).

The grand mal type seizures required for successful treatment of several mental disorders do not have to be induced electronically. Chemically induced seizures are just as effective (Fink, 2000). This fact, combined with the findings that the most effective forms of ECT directly stimulate midbrain structures, made Fink suggest that a central part of the brain stem, the hypothalamus, plays a key role in mental disorders. The hypothalamus is important in the expressions of emotions, and "has profound control over the rest of the body through its actions on the pituitary gland" (Fink 2000, p. 165). In Fink's theory, the repeated stimulation of the hypothalamus, which causes it to discharge a large amount of its hormones, leads to the normalisation of feedback systems throughout the brain.

Even though there are several theories, there is no agreement as to how ECT works (Fink, 2000; Glass, 2001; Kotin, 1993; Pace & Glass, 2001).

## Conclusion -- draft

Even though ECT has been around since 1938, and is one of the most efficient ways of treating depression, the mechanisms by which it works are still not clear.

Yes – melancholic features & ECT! Zorumski et al.: ECT for the elderly: A review.

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