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Review Article

The Role of Electroconvulsive Therapy in the Treatment of Depressive Illness in Old Age

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Electroconvulsive therapy is an important treatment in the depressive states of late life, and there is general agreement about the indications for its use in old age psychiatry. Indeed, old age may be associated with a better response to ECT than that in younger age groups. The additional risk involved through physical problems in the elderly is not great when compared with that of continuing depression and of the side-effects of alternative treatments. Temporary memory disorders and confusion may occur, but are minimised if unilateral electrode placement is used. Some patients treated with unilateral ECT do not respond, but will respond to bilateral treatment. Anxiety over unwanted treatment effects, which can lead to ineffective treatment of depressive illness, must be outweighed by knowledge of the dangers of leaving depression untreated in old age.

Electroconvulsive therapy (ECT) is used to treat a range of psychiatric disorders in younger people (Kendell, 1981), but in the elderly its use is virtually confined to patients suffering from serious mood disorders, particularly depressive states (Fraser, 1981). This can be considered in five sections.

(a) Which clinical features predict a good response to ECT?
(b) Do old people respond as well as younger patients to ECT?
(c) What physical problems are encountered in old people receiving ECT? Do any concurrent physical illnesses contraindicate ECT?
(d) What side-effects can be expected in old people treated with ECT?
(e) Are unilateral and bilateral treatments equally effective in the elderly?

Which clinical features predict a good response to ECT?

When ECT was first introduced its effect was so dramatic that it was not assessed by controlled trials. Post (1978), in his reflections on the major changes which had occurred during his professional lifetime working with mentally ill old people, describes how wards that had previously housed untreatable chronic melancholics were transformed by the possibility of resolution in response to treatment. Early enthusiasm for ECT led to its application in a wide range of clinical conditions.

The development of antidepressant drugs led to a review of the place of ECT in psychiatric treatment, and its role has become more clearly defined (Kendell, 1981). The evidence for the efficacy of ECT far outweighs any to the contrary, and now includes several controlled trials (Johnstone *et al*, 1980; West, 1981; Brandon *et al*, 1984). Although Lambourn & Gill (1978) found no difference between anaesthesia alone and anaesthesia plus brief pulse unilateral ECT, their study may be invalid because the stimulus they used may not have elicited effective convulsions.

Depression in late life remains a challenge for old age psychiatry, and prolonged morbidity is probably common in elderly depressives (Murphy, 1983; Baldwin & Jolley, 1986).

Several predictive scales have been developed from studies of people receiving ECT by relating response to treatment to initial symptoms. Unfortunately, comparison of the different scales is difficult because they were administered to populations of widely differing age structures. Abrams *et al* (1973) used three different scales, but found that none predicted outcome; they suggested that the reason for this could be that their sample included many older people, and age might alter the usual predictive features. Hobson (1953) had found earlier that presence of an obsessional previous personality was a significantly favourable feature, and was more common in those aged over 40 years.

Fraser & Glass (1980) studied 33 elderly depressed patients treated with ECT and, using a symptom check-list, compared the 12 patients who had responded best with the 12 patients who had responded worst. They found that patients who experienced good outcomes had higher scores on the scales for guilt, agitation, overall severity, depressed mood, psychic anxiety, and impaired work and interests. Duration of illness had been longer in the poorer-outcome patients. They concluded that in the elderly the degree of subjective mood change and

associated symptoms are more important than the distinction between neurotic and endogenous depression.

Salzman (1982) arrived at a similar list of predictors of good outcome in his review paper, including guilt, loss of interests, agitation, anxiety, dysphoria, helplessness, worthlessness, somatic delusions, nihilistic delusions, and vegetative signs. He also regards longer duration of illness as predicting a poorer response. Gaspar & Samarasinghe (1982) regarded psychotic depression with delusions of nihilism, sin, and guilt, or hypochondriacal delusions as an indication for proceeding directly to ECT.

In summary, there is general agreement about the features which predict a good response to ECT, and these include many of the symptoms associated with the concept of 'endogenous depression'. Anxiety/agitation, which is said to be an unfavourable feature in the young (Hamilton, 1982), is linked with a good response in the old (Fraser & Glass, 1980; Salzman, 1982).

Do old people respond as well as younger patients to ECT?

Several texts assert that greater age predicts a better response to ECT; for example, "of all depressive syndromes those of later life react best to ECT" (Dally & Connolly, 1981), and "older patients are said to respond particularly well to ECT" (Fraser, 1981). What evidence is there to support this view?

Gold & Chiarella (1944) found that patients over 40 were more likely to improve with ECT than younger patients, with the best outcome in those aged 51–60 years (the oldest group they studied). Hobson's (1953) study produced a similar finding, with 48% of those over 40 making a good recovery compared with 36% of the younger patients. Roberts (1959) studied 40–60-year-old women treated with ECT, and found a tendency for older patients to have lower total symptom scores after treatment. This difference was not sustained at three-month follow-up, and was dismissed as due to small sample size ($n = 50$).

Ottosson (1962) found that final outcome was independent of age, but that with increasing age therapeutic effect seemed to appear later, a finding that might be compatible with Godber's clinical impression that courses of ECT will often need to be much longer in the elderly (Godber, 1983). However, in a follow-up study, Godber *et al* (1987) used unilateral ECT as their preferred treatment, which may at least partly explain the longer courses.

Nystrom (1965) reported that young adults responded poorly to ECT. Mendels (1967) used a computer-derived method of relating clinical factors to the response of depressed patients to ECT, and found an association between improvement at three-month follow-up and age over 50 years, significant at the 5% level. Folstein *et al* (1973), in a retrospective study of 118 patients who had received ECT, also noted that the improvement was related to age: the improved group had a mean age of 50 years and the unimproved group a mean age of 31 years. Babigian & Guttmacher (1984) found that women aged over 75 years treated with ECT showed a substantially decreased mortality compared with non-ECT groups, suggesting that superiority for ECT compared with drug treatments in the elderly may not merely be short term.

From these studies the evidence suggests that older people "may actually have a better therapeutic response to ECT" (Weiner, 1982), but relatively few very old people have been studied. The psychopathology of depressive illnesses may differ at different ages, and it may be that to some extent the relationship depends on the propensity of the elderly to suffer from the sort of depressive illnesses that do respond well to ECT. For example, Baldwin (1988) found that delusional depressions in old age required more physical treatments, especially ECT and major tranquillisers.

Alternatively, a relationship between age and therapeutic outcome could depend on a change in seizure duration with age, although the evidence on this is conflicting. Maletzky (1978) demonstrated a clear relationship with age and that a good response occurred only with total seizure times of over 500 seconds. On the other hand, Shankel *et al* (1960) demonstrated a positive correlation between the patient's age and the number of initial convulsion failures, and between the patient's age and the average duration of the tonic period, and Weiner (1980) found that seizure threshold correlated positively with age, whereas seizure duration correlated negatively. The observation that seizure threshold also increases with the number of ECT sessions administered may be pertinent in treatment of recurrent depressive illness in the elderly (Abrams & Volavka, 1982).

What response rate can be expected in depressed old people? Two recent studies have reported similar initial recovery rates in psychogeriatric populations: Godber *et al* (1987) found 51% recovered and 23% much improved, and Benbow (1987) found 52% well and 28% improved.

What physical problems are encountered in old people receiving ECT?

A range of problems have been reported in elderly people receiving ECT, including anaesthetic-related muscle pain (Devine *et al*, 1964), dental fracture (Faber, 1983), intraperitoneal rupture of the bladder (Irving & Drayson, 1984), and fractures of the thoracic spine in unmodified treatment (Impastato & Almansi, 1943). Cerebral haemorrhage, coronary occlusion, aspiration pneumonia, and pulmonary embolism accounted for four fatalities during 20 000 administrations of ECT given over three years in Matthew & Constan's (1964) study. Even so, ECT is generally safe for the elderly, and may be safer than tricyclics in those with cardiac problems (Weiner, 1982).

Gaspar & Samarasinghe (1982) reported clinical experience with 33 elderly people who were given 384 sessions of ECT over three years. One patient accidentally cut her tongue, and another vomited during recovery. Two patients showed prolonged confusional states, which worsened after each session of ECT, but cognitive function was fully recovered within days of completing each course. Four of the 33 people died within the study period, two in the community after discharge from hospital. Of the two who died while in psychogeriatric care, one had failed to respond to ECT and pursued a deteriorating course to die of bronchopneumonia, and the other patient, who suffered from depression and dementia, fell, sustained a fracture, and died six months after recovering from the depressive illness.

Fraser & Glass (1980) found a low incidence of side-effects, with no difference between unilateral and bilateral treatments. Of their original 33 patients, one died of a chest infection, and another was transferred to a different hospital with a chest infection. Similarly, of Karlinsky & Shulman's (1984) 33 patients, one had repeated episodes of pneumonia during a course of ECT.

Elderly people who receive ECT tend to have many physical problems. Gaspar & Samarasinghe (1982) divided their patients into major, minor, and no risk cases on the basis of physical examination, past and present history, and investigations. Ten out of 33 patients had major and 15 had minor risk factors. Eight patients were free from risk factors and, of those, some had abnormal findings which were not regarded as constituting a risk. For the major risk group, ECT was very safe since no patient died of anaesthetic or ECT complications.

Vascular problems remain a concern for those prescribing ECT for the elderly. Gerring & Shields (1982) found that 40% of 42 patients treated with ECT had pre-existing cardiac disease, and of these, 70% developed signs of ischaemia or an arrhythmia during treatment. Four episodes were potentially life threatening. All cardiac complications occurred in those over 50, the majority in those over 60.

Medical problems arising during ECT are significantly more common in those aged over 65, and the most important of these are cardiovascular (Alexopoulos *et al*, 1984). A review of 30 patients aged 60 and over receiving ECT at another centre found that adverse events were concentrated in the oldest patients, and correlated with a general index of physical health; in particular, patients who developed complications were likely to have a history of cardiovascular disease (Burke *et al*, 1985). Serial electrocardiograms and serum cardiac enzyme concentrations in patients receiving ECT have not revealed any persistent changes (Dec *et al*, 1985), but caution is advised in those over 75, especially with known cardiovascular disease, and Gerring & Shields (1982) recommend additional precautions and close monitoring in patients at high risk of cardiac arrhythmias.

ECT has been used successfully and safely in patients with post-stroke depressive illnesses and active medical problems (Murray *et al*, 1986). Loo *et al* (1985) have described five successful courses of treatment in depressed people on anticoagulants. Atre-Vaidya & Jampala (1988) note that, where affective disorder and Parkinson's disease are present together, ECT may be the treatment of choice because of poor response to, or complications with, drug treatments.

The presence of dementia is not incompatible with the use of ECT (Perry, 1983; Benbow, 1985, 1988). Psychogeriatricians have not excluded patients who are demented as well as depressed from treatment (Godber *et al*, 1987; Benbow, 1987). Indeed, Salzman (1982) argues that, since memory impairment in dementia may be exacerbated by the memory loss associated with depressive illness, ECT may improve memory function in some demented old people with superadded depressive illnesses.

It seems that physical problems in old people receiving ECT are not a major difficulty when one considers how ill this group are both physically and mentally, and that untreated depressive illness is itself a more serious threat.

What side-effects can be expected in old people treated with ECT?

Effect on memory

Anterograde and retrograde amnesia appear early in a course of ECT and are cumulative, but with some

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recovery between treatments. The anterograde amnesia fades after completion of the course, and effectively disappears by six months. Retrograde amnesia also shrinks after completion of the course, to leave some permanent loss only for events occurring during the week or two before treatment. The depressive illness itself may at least partly contribute to this loss. Memory complaints are fairly common after ECT, and persist even when deficits can no longer be detected on testing. It is generally accepted that complaints are less after unilateral treatment (Squire, 1982).

Since cognitive impairment is more often found in elderly people, their memories are regarded as more vulnerable. As memory loss is greater after bilateral ECT than after unilateral non-dominant ECT, unilateral is often preferred in practice with the elderly (Salzman, 1982).

Fraser & Glass (1980) found that all their patients had impaired memory function when tested before ECT, but three weeks after ECT their scores had improved to within a normal range for their age. They could find no significant difference between unilateral and bilateral groups on testing. Raskind (1984) found no evidence of an interaction between patient's age and cognitive change following ECT. Autopsy findings on an 89-year-old who had received 1250 ECT treatments showed no evidence of brain injury (University of Louisville School of Medicine, 1985).

Confusion

Fraser & Glass (1978) examined nine patients who had been given a course of alternating bilateral and unilateral treatments, and found that the time to recovery of consciousness, respiration, and orientation was significantly slower after bilateral ECT. Bilateral ECT also showed a cumulative effect, in that the time for recovery was significantly prolonged after the last bilateral ECT of a course compared with the first. There was also an interval effect with bilateral ECT, in that recovery time was prolonged further if treatment was given after a one-day rather than a two-day (or more) interval. In contrast, unilateral ECT showed neither cumulative nor interval effects. The authors concluded that unilateral ECT is to be preferred, and did not alter this view despite a later study which did not demonstrate a cumulative effect with bilateral ECT (Fraser & Glass, 1980).

Psychotropic medication during ECT and prior major medical illness are factors which have been found to be important in the development of acute confusional state after ECT (Summers *et al*, 1979), and both are common in elderly populations treated with ECT.

One retrospective study (Alexopoulos *et al*, 1984) found that transient disorientation occurred in 12.6% of elderly patients given ECT, and another (Benbow, 1987) reported confusion in 24% of courses to elderly people.

Are unilateral and bilateral treatments equally effective in the elderly?

It has often been stated that unilateral ECT should be the rule in elderly patients because of the shorter recovery time and less memory impairment (Fontaine & Young, 1985). Heshe *et al* (1978) recommended unilateral ECT as the standard procedure unless the patient is female, over 60 years of age, and only mildly depressed, even though their results are capable of a contrary interpretation. In their study, the results with bilateral ECT were significantly better than with unilateral ECT one week after completion of treatment, but this difference had disappeared at three months. The authors relate this early discrepancy to the seven patients within their unilateral group who did not respond to treatment; in addition, seven out of the 51 patients were not assessed at three months. These results suggest that bilateral treatment is superior, at least in the short term.

Stroemgren (1973) also preferred unilateral ECT, because of the tendency for bilateral ECT to affect memory. She had found no difference in therapeutic efficacy, despite the fact that, in the 45–65-year age group, a comparable therapeutic effect had been achieved using significantly fewer bilateral ECT compared to unilateral ECT.

Fraser & Glass (1980) studied 33 elderly patients who were randomly assigned to unilateral or bilateral treatment, and who were assessed blindly through the course. No difference was found in the length of course or the decrease in Hamilton rating score. They concluded that unilateral ECT was preferable to bilateral, but it must be borne in mind that the population they studied may not have been typical of patients receiving ECT: a substantial proportion of their sample were out-patients, they were well enough to manage without psychotropic medication for 24 hours before treatment, and an average of only 6.5 treatments was necessary to achieve remission.

Salzman's (1982) clinical experience is that elderly patients who have not had ECT before will respond to shorter courses than will younger patients. He notes that some old people are resistant to treatment, especially if they have had ECT before, and suggests

that this group will respond better to bilateral treatment. Overall he concludes that unilateral ECT is the treatment of choice, with the reservation that a trial of bilateral ECT is indicated if there is no response. Heshe *et al* (1978) also found a resistant group.

Price (1981) reported that 16 out of 35 depressed patients showed marginal or no response to unilateral ECT, but all subsequently responded well to bilateral. His non-responders were aged 31–83 years. He concludes that it is important not to discontinue treatment if there is no response to unilateral ECT, but rather to switch to bilateral treatment.

Abrams (1982) estimated the group of non-responders as 15–30% of endogenously depressed patients referred for ECT, but could not predict which patients would fail to respond. Mielke *et al* (1984) reported a similar proportion of non-responders; this group may have a higher proportion than expected of elderly people. Pettinati *et al* (1986) analysed the differences in efficacy between unilateral and bilateral ECT, and found a trend for older people to fare better with the latter. This could explain why findings vary between studies where the age profiles of recipients are dissimilar. Abrams (1986) suggested that this could explain the large therapeutic advantage for bilateral ECT in a study with a mean patient age of 51 years (Abrams *et al*, 1983).

Conclusions

(a) A wider variety of depressive illnesses in the old will respond to ECT, and anxiety/agitation is linked with a good treatment response.
(b) The elderly respond to ECT at least as well as younger people, and may even respond better.
(c) The elderly population treated with ECT have many physical problems, but in practice these do not interfere with the successful administration of treatment.
(d) Side-effects are not a major problem in the use of ECT. Theoretically memory problems should be more prominent after bilateral ECT, but this is not found clinically. Recovery time is prolonged after bilateral treatment, but there is no evidence that this is detrimental clinically.
(e) For many old people unilateral and bilateral ECT are equally effective in relieving depressive illness, but some will respond better to bilateral treatment, and these may have a history of previous response to bilateral ECT.

ECT clearly retains an important place in the armoury against severe depressive states in old age. In view of the continued chronic morbidity of depressive illnesses despite modern antidepressant drugs, it is important to review the use of the treatment in order to minimise the possibility of patients being denied effective treatment because of preoccupation with temporary side-effects, exaggerated potential hazards, or media pressure.

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