Schizophrenia Research 146 (2013) 1–9

Contents lists available at SciVerse ScienceDirect

Schizophrenia Research

journal homepage: www.elsevier.com/locate/schres

Indications for electroconvulsive treatment in schizophrenia: A systematic review

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ARTICLE INFO

Article history:
Received 12 October 2012
Received in revised form 18 January 2013
Accepted 5 February 2013
Available online 15 March 2013

Keywords:
ECT
Electroconvulsive therapy
Psychosis
Schizophrenia

ABSTRACT

Background: Electroconvulsive therapy (ECT) is a medical treatment that is most effective for mood disorders (Bipolar Disorder and Major Depression). It has also been shown to be an effective treatment for schizophrenia accompanied by catatonia, extreme depression, mania and other affective components. ECT is currently underused in many psychiatric settings due to its stigmatized perception by patients and mental health professionals. However, many unanswered questions remain regarding its role in the management of patients with schizophrenia.
Aim: Evaluate the main indications of ECT in subjects suffering from schizophrenia.
Objectives: Investigate the efficacy and the main indications of ECT in the treatment of schizophrenic patients, evaluate its effects in the short-term and the long-term, compare ECT treatment with pharmacotherapy, and assess the effects of treatment with ECT.
Methods: A systematic review of the literature was conducted on the use of ECT for schizophrenia. Thirty one articles from peer-reviewed journals were identified, and the most relevant articles were selected for this review.
Results: The most common indication for using ECT for schizophrenia patients was to augment pharmacotherapy, while the most common accompanying symptoms were, in order, catatonia, aggression and suicide. Catatonic patients responded significantly better to ECT than patients with any other subtype of schizophrenia. The combination of ECT with pharmacotherapy can be useful for drug-resistant patients. The use of an ECT-risperidone combination or ECT-clozapine combination in patients non-responsive to prior pharmacotherapy was found to be most effective.
Conclusions: This review indicates that ECT, combined with pharmacotherapy, may be a viable option for a selected group of patients with schizophrenia. In particular, the use of ECT is recommended for drug-resistant patients, for schizophrenic patients with catatonia, aggression or suicidal behavior, and when rapid global improvement and reduction of acute symptomatology are required.

1. Introduction

Electroconvulsive therapy (ECT) is a medical treatment that is effective for mood disorders (Bipolar Disorder and Major Depression). In 1938, Ugo Cerletti and Lucio Bini, two Italian psychiatrists, were the first to use anticonvulsant therapy in the field of psychiatry, and the first patient given the treatment had a psychotic disorder (Cerletti, 1950). In 1950, the introduction of neuromuscular blocking drugs led to a reduction of side effects (Bennett, 1972) and improved the toleration of ECT by patients (Clare, 1980). The patient is monitored for the duration of the treatment and awakens after a few minutes. The patient does not usually remember the treatment. Upon waking, the main side-effects are headaches, confusion, memory loss (retrograde amnesia) and difficulty in storing information (Frankel, 1984), but these side-effects tend to dissipate with the passage of time, although there are individual variations in this (Frankel, 1984). The use of ECT declined after the introduction of antipsychotic drugs, and its use has been limited to patients who are resistant to pharmacotherapy (Fink and Sackeim, 1996).

Recent studies have shown that a combination of ECT and antipsychotics has a significant advantage in terms of rapidity and quality of response (Taylor and Fleming, 1980; Janakiramaiah et al., 1982; Ungvari and Petho, 1982; Abraham and Kulhara, 1987; Sarita et al., 1998). Treatment guidelines from the American Psychiatric Association (Weiner et al., 2001) suggest that ECT can be used in the treatment of schizophrenia for catatonia, in patients with a past history

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http://dx.doi.org/10.1016/j.schres.2013.02.005

of a good response to ECT, and for treatment-resistance to medication. According to some studies, ECT may also be useful for schizophrenic patients with acute suicidal risk (Greenblatt, 1977; Tsuang et al., 1979). The aim of the present paper was to investigate the main indications for the use of electroconvulsive treatment in patients with schizophrenia.

2. Materials and methods

2.1. Selection criteria and quality assessment

In order to provide a new and timely systematic review about the main indications for using ECT with patients with schizophrenia, following the PRISMA statement for reporting systematic reviews (Liberati et al., 2009), we performed a careful MedLine, Excerpta Medica, PsycLit, PsycInfo and Index Medicus search to identify all papers and book chapters in English for the period of 1945 to 2012. The following search terms were used: "ECT*" (which comprises electroconvulsive therapy, electroshock and other ECT-related terms) and "Schizophrenia." Textbooks on psychiatry were also consulted. The selection of papers suitable for this review was restricted to articles published in English peer-reviewed journals and those that added an original contribution to the literature. Where a title or abstract seemed to describe a study eligible for inclusion, the full article was obtained and examined to assess relevance based on the inclusion criteria. Any discrepancies between the two reviewers who, blind to each other, examined the studies for the possible inclusion, were resolved by consultations with the senior authors. In addition, we also examined reference lists and contacted experts in the field.

The principal reviewer (MP) inspected all reports. Then, three reviewers (GD, LL, AF) independently inspected all citations of studies identified by the search and grouped them according to the topic of the papers. Reviewers acquired the full article for all papers located. Where disagreement occurred, this was resolved by discussion with MP who also independently inspected all articles located and grouped them following the major areas of interest identified by the reviewers. If doubt remained, the study was put on the list of those awaiting assessment pending acquisition of more information. We also consulted a number of international experts in the field to determine whether the studies selected were relevant for discussing the subject matter. The authors and experts who were consulted performed a careful analysis of the literature and agreed on a number of key subjects relevant to the aim of this paper.

A quality assessment was performed as shown in Table 1. Studies were rated for their quality using the following criteria: (i) how representative the sample was (1 point), (ii) the presence of a control group (1–2 points), (iii) more than 1000 patients (1–2 points), (iv) duration of follow-up of one year or more (1–2 points), (v) evidence-based measures of diagnostic assessment (1–2 points), (vi) data presentation (1–2 points), and (vii) evidence-based measures for assessing the efficacy of ECT (1–2 points). Quality ratings for each study ranged from zero to 13.

2.2. Search results

The combined search strategies yielded, after duplicates were removed, a total of 1280 articles, of which the most relevant articles were selected for this review. We first reviewed the titles and abstracts and applied the selection criteria outlined above with the exception of study design. This process led to the exclusion of 808 studies from the 1280 originally selected. The large majority of studies excluded failed to mention in the title and abstract any of the outcome indicators specified above. Only a few studies were excluded because they were written in a language other than English.

In the second stage of the screening process, two new reviewers read the full articles and coded them based on the methodology. Studies that did not meet the methodological standards set by the review were excluded. This process led to the exclusion of 420 studies, resulting in the inclusion of 31 clinical-studies for the final review. The stages of the screening process are illustrated in Fig. 1.

3. Results

3.1. Real versus sham ECT

Seven studies have compared ECT plus antipsychotics against sham ECT plus antipsychotics in schizophrenia patients (Naidoo, 1956; Taylor and Fleming, 1980; Abraham and Kulhara, 1987; Brandon et al., 1985; Sarkar et al., 1994; Sarita et al., 1998; Goswami et al., 2001). The effectiveness of ECT over sham ECT may be obscured by concomitant treatment with antipsychotics, which are indisputably effective in improving the symptoms of schizophrenia. Three studies did not use antipsychotics in combination with ECT or sham ECT/placebo (Brill et al., 1959; May et al., 1976; Small et al., 1982). These three studies conducted in the 1960s and 1980s demonstrated the efficacy of real over sham in schizophrenia and suggest that: (1) when ECT is compared to sham ECT, more people improved in the real ECT group, and (2) ECT resulted in fewer relapses in the short term than sham ECT and a greater likelihood of being discharged from hospital.

Patients treated with real ECT show greater global improvement than the placebo group in the short-term (Small et al., 1982; Abraham and Kulhara, 1987). Moreover, the ECT groups have fewer relapses. However, there is no evidence that this early advantage for ECT is maintained over the long term (Abraham and Kulhara, 1987). Abraham and Kulhara (1987) examined twenty-two patients with schizophrenia who received trifluoperazine in a double-blind trial and were randomly allocated to receive eight real or eight simulated ECTs. In the first eight weeks, the group receiving real ECT showed significantly more improvement as measured on the Brief Psychiatric Rating Scale (which measures global improvement in the short-term). However, the groups did not differ from the twelfth week on, and the superiority of real ECT was not present at the end of six months.

3.2. Bifrontal versus Bitemporal ECT

Phutane et al. (in press) compared the clinical and cognitive effects of bifrontal and bitemporal electrode placements in 122 schizophrenia patients referred for ECT. The schizophrenic patients were randomly assigned to the two ECT types, but the antipsychotic medications administered and the number of ECT sessions were not noted. Bifrontal ECT resulted in superior clinical and cognitive outcomes than bitemporal ECT.

3.3. Main indications for ECT in schizophrenia

3.3.1. Drug-resistant patients

When ECT is directly compared to antipsychotic drugs, the results favor medication, although some of the results suggest that ECT combined with pharmacotherapy leads to a greater improvement in mental state (Gazdag et al., 2006). Therefore, ECT combined with antipsychotic medication may be an option for patients with schizophrenia who have a limited response to drug therapy alone and when both a rapid global improvement and a faster reduction in symptomatology are desired (Small et al., 1982; Abraham and Kulhara, 1987).

There have been several studies documenting the successful use of an ECT-risperidone combination (Tang and Ungvari, 2002; Ravanic et al., 2009) and also an ECT-clozapine combination in patients non-responsive to pharmacotherapy (Flamarique et al., 2012). Flamarique et al. (2012) investigated the ECT-clozapine combination vs ECT and other antipsychotic combinations vs ECT-benzodiazepines in 28 adolescent patients with schizophrenia who were medication-resistant. The main findings of this study were that combining ECT with clozapine, compared