



## Electroconvulsive Therapy among Elderly patients: A study from Tertiary care centre in north India



Sandeep Grover\*, Ashirbad Satapathy, Subho Chakrabarti, Ajit Avasthi

Department of Psychiatry, Postgraduate Institute of Medical Education & Research, Chandigarh, 160012, India

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### ABSTRACT

**Objective:** This retrospective study aimed to evaluate the effectiveness and safety of ECT among elderly patients receiving electroconvulsive therapy (ECT).

**Methods:** During the study period of January 2008 to May 2017, 151 patients aged  $\geq 60$  years received ECT and they formed the study sample. Data on patients aged 19 to 59 years for the period of 3 years (2014–2016) was also extracted for comparison purposes.

**Results:** The mean age of the elderly subjects was 65.8 years. In contrast to the young patients, elderly patients who received ECT more often had diagnosis of affective disorder, especially unipolar depression. Compared to young patients, elderly patients had higher prevalence of physical comorbidity with one third having more than one physical illness. The most common reason for use of ECT among elderly was poor response to medications (62.3%), followed by requirement of early response (49.6%). Four-fifth (80.8%) of the elderly patients showed  $\geq 50\%$  reduction in the symptoms with ECT. In terms of side effects, acute blood pressure changes were seen in 40.3% of patients during the ECT procedure and about half of the patients reported cognitive disturbances.

**Conclusion:** Present study suggests that ECT can be safely used among elderly patients, especially those with depressive disorders, not responding to medications.

### 1. Introduction

Electroconvulsive therapy (ECT) is possibly the only treatment modality in psychiatry, which has survived the test of time and over the years, the technical aspects of use of ECT have improved. Despite this, efficacy/effectiveness of ECT has never been in doubt (Moser et al., 2005). Various controversies and negativistic opinion about ECT has led to decline in use of ECT in developed countries and it is one of the last resort treatments for various psychiatric disorders (Glen and Scott, 1999). In terms of trends for use of ECT, data from the developed countries suggest that elderly form a large proportion of patients receiving ECT. Different surveys from countries like United States, United Kingdom and Australia suggest that about one fourth to half of the patients receiving ECT are aged above 65 years (Pippard and Ellam, 1981; ECT survey England, 1999; Reid et al., 1998; Kramer, 1999; Prudic et al., 2001; Wood and Burgess, 2003; Chanpattana, 2007). Data also suggest that elderly are 2 to 7 times more likely to receive ECT, compared to subjects belonging to other age groups (Duffett et al., 1999; Olfson et al., 1998). The indications for use of ECT among elderly are similar to those in adult population, but it is primarily used for management of depressive disorders (Benbow, 2005; Rabheru, 2001;

Flint and Gagnon, 2002). Some of the authors suggest that higher use of ECT among elderly may be attributed to poor efficacy of medications in this population, especially, in elderly patients with depression, especially those with vascular depression; poor tolerability to medications due to pharmacokinetic changes, medical comorbidities and better efficacy of ECT in elderly patients with depression, compared to adult patients (Kerner and Prudic, 2014). ECT is considered as a low-risk procedure among elderly with various medical disorders (Kelly and Zisselman, 2000) and the cognitive side effects of ECT among elderly are considered to be usually transient and not severe (Geduldig and Kellner, 2016). In terms of efficacy, ECT has not only been shown to be efficacious in management of acute phase of depression among elderly, but has also been shown to be efficacious and safe as continuation and maintenance ECT (Van Schaik et al., 2012). The response and remission rate with ECT among elderly with acute depression vary from 50 to 84%, with higher response rate among those with psychotic depression and higher age (Kelly and Zisselman, 2000; O'Connor, 2002; Flint and Rifat, 1998).

Compared to West, ECT is more frequently used in developing countries like India and China with increasing trends in last few decades (Xiang et al., 2015). Elderly form the third largest group, after

\* Corresponding author.

E-mail address: [drsandeepg2002@yahoo.com](mailto:drsandeepg2002@yahoo.com) (S. Grover).

those aged 45 to 64 years and 25 to 44 years (Chanpattana et al., 2005).

However, data in terms of use of ECT among elderly from developing countries is sparse (Jain et al., 2008; Zhang et al., 2015). A retrospective study from India showed that elderly ( $\geq 60$  years) form 15% of all patients who receive ECT. The most common indication for ECT among elderly was severe depression not responding to adequate psychotropic medications. Two-third of the elderly patients who received ECT had comorbid medical illnesses. In terms of effectiveness, 70% of patients showed more than 50% reduction in symptomatology with better response rate among those with inadequate response to antidepressant medications prior to starting ECT. Presence of medical comorbidities was associated with higher risk of development of cognitive side effects (Jain et al., 2008). A large sample ( $N = 2339$ ) retrospective study of elderly ( $\geq 60$  years) patients from China demonstrated that 28.1% of elderly inpatients received ECT, with most common indications for use of ECT being major depression, followed by bipolar disorder and schizophrenia. Compared to those who did not receive ECT, elderly patients who received ECT more often belonged to those aged 60–64 years, had high risk of suicide, lower risk of falls at the time of admission, lower use of mood stabilizers and antidepressants, lack of health insurance, a diagnosis of major depression and comorbid medical disorders (Zhang et al., 2015).

Considering the sparsely available data on use of ECT among elderly patients from developing countries, there is a need to expand the literature. The present retrospective study aimed to evaluate the effectiveness and safety of ECT among elderly.

## 2. Material and methods

This retrospective study was conducted at a multi-specialty tertiary care hospital in north-India. The study was approved by the ethics committee of the institute.

The hospital provides both outpatient and inpatient services to the patients seeking mental health care. On an average, about 10,000–14,000 new patients seek psychiatric treatment every year, and about 200 patients are admitted to the inpatient unit. There is no separate geriatric inpatient unit and elderly patients admitted in the same unit as the adult patients. Whenever a new patient attends the psychiatry services, she/he is initially evaluated by a senior resident (equivalent of a registrar) or a consultant and the treatment is initiated based on diagnosis as per the International Classification of Diseases, 10th revision (ICD-10) and the patient is given an appointment for detailed evaluation. At the time of detailed evaluation, patient is initially seen by a trainee resident (Junior Resident), who collects information from the patient, family, reviews the available treatment records (both psychiatric and medical) and then the case is discussed with a consultant. Based on the available information, a diagnosis is arrived at and the treatment plan is formulated. Most of the patients are managed with pharmacotherapy and psychological interventions. In very few selected cases, ECT is offered.

All patients who are administered ECT receive bilateral modified ECT. ECT is administered to both inpatients and outpatients. The decision to administer ECT is usually taken by the consultant-in-charge of the case, in consultation with other treating team members. In few complicated cases, a second opinion is often sought from other consultant.

ECT is usually advised based on the patient's clinical status, severity of symptoms, response to other treatment and past history. Once ECT is considered as a treatment, patient and family members are approached and explained about the need for the ECT and procedure of ECT. They are also provided with an information booklet, which is in the local language, to read and clarify their queries. Once, they agree for ECT, a written informed consent is obtained from the patient and/or family members accompanying the patients, who are actively involved in taking care of the patient. Patients who agree to undergo ECT are evaluated physically, undergo necessary investigations and are

evaluated by the anaesthetist for their fitness to undergo ECT. If the patient is considered to be fit for ECT, then they are administered ECT by using an indigenously manufactured machine (Medicaid Systems, Chandigarh, India). All patients undergo, bilateral, brief-pulse, modified ECT. The ECT machine delivers constant energy, however, it has the provision for adjusting the duration of current passed (0.1 s to upto 5 s), frequency (settings of 20, 40, 50, 60, 70, and 90 Hz), and the pulse width (0.1, 0.2, 0.5, 1, 1.2, and 1.5 s). The machine also has a provision for Electroencephalographic monitoring; however this is not done routinely. Usually, the frequency (70 Hz) and pulse width (1 s) are kept constant and the duration of current is adjusted. In elderly subjects, the first stimulus is given at 0.6 s. If the patient does not have an effective seizure (motor seizure of 15-s duration), the duration of current passed is increased and a maximum of 3 stimuli are given in an ECT session. In subsequent sessions, the electrical dose is adjusted to compensate for the rise in the seizure threshold. ECT is given three times a week (Monday, Wednesday, and Saturday) by a trainee resident under the supervision of a senior resident and a consultant. The anaesthesia team includes a trainee resident, a senior resident, a consultant and a technician. Pre-medication for ECT involves use of atropine (0.2–0.3 mg)/glycopyrrolate (0.2–0.3 mg). Induction is usually done by thiopental sodium (150–450 mg) with occasional patient given propofol (60–100 mg). For muscle relaxation, succinylcholine (30–60 mg) is used. All the patients are adequately oxygenated prior to giving electrical stimulus. The seizure duration is recorded on the basis of the cuff method and a motoric seizure of at least 15 s is considered to be an indicator of effective ECT. Patients receiving ECT are usually evaluated on the standardized scales such as the Hamilton Depression Rating Scale (HDRS), the Young Mania Rating Scale, Geriatric Depression Rating Scale and the Brief Psychiatric Rating Scale for the level of improvement.

In general sedative/hypnotic agents are withdrawn prior to administration of ECT. Other medications are also withdrawn, if these are considered to interfere with ECT. Some of the patients who have not responded to an adequate antidepressant trial, undergo change of antidepressant, prior to or after the starting of ECT. Patients are kept fasting for the overnight, prior to ECT. However, patients are allowed to take their antihypertensive medications and other essential medications on the day of ECT. Data of all the patients receiving ECT is entered into an ECT register and patient treatment records. The ECT registered is reviewed weekly for completeness.

For this study, the ECT register for the period of January 2008 to May 2017 was screened to identify patients aged  $\geq 60$  years at the time of administration of ECT. Treatment records of the identified patients were reviewed to extract the ECT details for this study. Additionally, data pertaining to sociodemographic variables, clinical variables and other treatment were extracted from these records. During this period, 151 patients aged  $\geq 60$  years received ECT and they formed the study sample for this study. Data on patients aged 19–59 years for the period of 3 years (2014–2016) was also extracted for comparison purposes. All data were initially extracted by A.S. and subsequently randomly cross-checked by S.G. for accuracy.

Data was analysed by using SPSS-16 version. Categorical variables were analysed in the form of frequency and percentages. Continuous variables were evaluated in the form of mean and standard deviations. Comparisons were done by Chi-square test and *t*-test.

## 3. Results

### 3.1. Study sample and demographic profile

During the study period of total 151 patients aged  $\geq 60$  year were given ECT during the study period. The mean age of patients was 65.8 years (SD, 5.18 years; range, 60–81 years) with only only-fourth ( $N = 35$ ; 23.2%) of patients being aged  $\geq 70$  years. The mean duration of education of patients was 8.42 (SD – 6.14). Higher proportion of the

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