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ORIGINAL ARTICLE

Electroconvulsive therapy in geriatric patients: A literature review and program report from Virginia Commonwealth University, Richmond, Virginia, USA

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ABSTRACT

Electroconvulsive therapy (ECT) is an effective therapeutic intervention in the elderly patients with major depression, especially those with psychosis, suicidality, catatonia, nutritional compromise, and resistance to medications. Response rates can be as high as 80%. We present an extensive review of the relevant literature, provide a description of the ECT program at Virginia Commonwealth University in Richmond, Virginia, USA, and present results of our experience with ECT in fifty elderly patients. The treatments were safe, well tolerated, and produced high response rates, variably between 68% and 84%. Patients in the long-term maintenance ECT program continue to show sustained benefits from ECT.

Key words: Electroconvulsive therapy, geriatric, program

INTRODUCTION

It is by now well documented that more than a third of patients with major depressive disorder (MDD) fail to respond to recommended pharmacologic and psychotherapeutic treatments.[1] Such patients may be appropriately termed as having "treatment resistant or refractory depression" (TRD). This condition necessitates the use of a more invasive therapy such as electroconvulsive therapy (ECT). ECT also produces a more rapid response than medications and psychotherapy, making ECT, especially useful in suicidal patients and nutritionally compromised patients where rapid response is essential.[2-4] ECT may be superior to medications in more challenging cases where patients suffer from depression with psychotic features or catatonic features.[5] Finally, ECT is effective in psychotic and manic disorders and should be considered when first- and second-line therapies for these conditions have not been effective or have only produced a partial response.[6] All of the above indications apply just as much in the geriatric population as in adults.

LITERATURE REVIEW

A PubMed and Google Scholar literature search was conducted with the terms "ECT," "electroconvulsive therapy" and "geriatric or elderly after geriatric" for the time period between 2000 and 2017; the search yielded more than seventy unique studies which were reviewed.

Efficacy

ECT has been cited as effective in as many as 70%–80% of geriatric patients with MDD, independent of age, or any preexisting cognitive impairment.[7-15] Existing evidence suggests that objective signs of response are supported by subjective report[16] and may be observed more quickly in the course of treatment.[17] One multisite study of 253 patients of varying ages even reported that increasing age positively influenced response to treatment;[18] this possibility is reinforced by a relatively lower rate of rehospitalization in geriatric patients treated with ECT with respect to the nongeriatric population.[19] Although controversial, factors including temporal lobe atrophy (but not global atrophy),[20] cardiac vagal modulation,[21,22] and subcortical gray matter hyperintensity lesions[23,24] have been reported as biological factors potentially limiting efficacy and perhaps increasing mortality; a number of potential structural differences such as smaller temporal cortex and hippocampal volume have been identified as predictive of greater treatment response.[25,26] In addition, longer postictal recovery times have been associated with quicker response to therapy.[27] One larger study of 239 geriatric patients indicated a lack of social support,

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poor self-reported health rating, as well as the use of antipsychotic or antidepressant medications as predictors of longer time to remission whereas use of ECT in the past year was associated with shorter time to remission.[28] One possible mechanism proposed for the efficacy of ECT in geriatric patients was a relative increase in frontal lobe white matter identified by diffusion tensor imaging in eight depressed geriatric patients, ameliorating suspected problems in white matter integrity.[29]

Both right unilateral (RUL) and bifrontal (BF) lead placements have demonstrated strong efficacy in treating depression in the elderly.[30,31] High-dose RUL ECT was demonstrated in one study to be more efficacious than bilateral ECT in a group of elderly patients after they had failed to improve on moderate dose RUL ECT.[31] To help in deciding whether to continue RUL or switch to BL therapy, one study proposed using electroencephalogram (EEG) indices as a guide for determining likelihood of benefit when RUL ECT appeared inadequate in an elderly cohort.[32] In the absence of definitive evidence, in our program, ECT is always started with RUL placement for MDD without psychosis – see program description below for more details on this.

Combination pharmacologic and ECT were shown to be more rapidly efficacious than monotherapy[33,34] in treating unipolar depression in the elderly with greater survival time and no apparent loss of tolerability.[35] This trend was also observed with combination therapy of psychotic depression in the maintenance phase.[36] Although evidence is relatively more sparse, ECT is reported to be effective in treating bipolar depression,[10] agitation in dementia patients,[37-39] bipolar mania in dementia patients,[40-42] catatonic schizophrenia,[43,44] and depression in multisystem atrophy.[45] Finally, due to significant rates of relapse in treating depression, maintenance combination therapy is recommended.[46] Maintenance ECT has been demonstrated to be effective in limiting relapse in patients with catatonic schizophrenia[47] as well as dementia with agitation and manic symptoms.[43]

Safety

Overall, ECT has been demonstrated to be relatively safe and well tolerated in the geriatric population,[9,11,33] and the incidence of adverse effects may be independent of age.[48] One study of 52 geriatric patients treated with ECT found that about twenty patients (38%) reported adverse effects including memory loss, confusion, and hypertension, suggesting a need for careful consideration of such factors when recommending ECT for geriatric patients.[8] Overall, cognitive deficits were the most commonly reported side effect of ECT ranging from 6% to 40% in nondemented elderly. These side effects were reported as transient or reversible,[10,18,49] and it has also been reported that cognitive function can be overall unaffected or may actually improve with ECT treatment over the longer term.[50-52] No specific and reliable data are available on the prevalence of postictal delirious state in the elderly; in our own experience, this does happen rarely and quickly reverses. Ensuring hydration and normal electrolytes as well as avoiding long seizures or excessive sedating medication might help avoid this. RUL placement of electrodes has demonstrated fewer cognitive side effects.[53] Unlike in adults, no data are available on the relation between individual stimulation parameters such as electrical charge, frequency, pulse width, and energy delivered and cognitive side effects in the elderly. The same lack of data is also true for anesthetic and paralyzing agents. Neuropsychological assessment has shown both retrograde and anterograde deficits with the most common being delayed verbal anterograde memory.[50] More serious or life-threatening adverse effects included an increased rate of falls[54] as well as increased incidence of bigeminy and trigeminy as well as supraventricular tachycardia[55,56] associated with treatment. Despite these potential risks, administration of ECT to patients with intracardiac defibrillators was determined to be safe by a number of studies.[51] Generally speaking, serious medical conditions become relative contraindications to ECT which can be overcome by the involvement of the appropriate consulting professionals.[57,58] In comparison with other modalities of treatment, one review pointed to prior results which indicated a relatively lower rate of side effects associated with ECT in comparison to pharmacotherapy in patients >75 years of age.[59] No difference in brain perfusion was detected between the two treatment modalities;[60] however, it has been noted that lower average pre-ECT hemispheric cerebral blood flow and EEG mean signal has been associated with increased risk of developing dementia.[61]

Accessibility

Due to the medically intensive nature of the ECT procedure and longer periods of postprocedure observation, cost, and thus accessibility of treatment is a concern. Indeed, one European postal survey demonstrated that access was most frequently limited by cost.[62] One Canadian review of healthcare data of 12 million citizens indicated that ECT was more commonly prescribed in elderly patients with respect to other adults and that it remains a commonly prescribed treatment.[63] Perhaps paradoxically, reservations about utilization of ECT held by clinicians may also limit access as suggested by one study of geriatric psychiatrists in the Netherlands.[64] Decision-making capacity does not appear to be a barrier to access overall, and psychoeducation is effective in further improving capacity;[65] however, there exists a threshold in cognitive functioning past which psychoeducation is ineffective in further improving decision-making capacity.[66] The authors of the study opined that this limitation may be due to a ceiling effect and/or psychosis. Fear and social stigma associated with the treatment are significant barriers as well as limited access to psychiatric consultants and appropriately equipped facilities.[67] Animal-assisted therapy may have a useful role in defraying the preprocedural anxiety and fear associated with ECT and improve access and adherence.[68] In this study conducted in our program, 15 min of interaction with a therapy dog while awaiting the ECT procedure significantly reduced fear and anxiety.

Although not directly relevant to this report, it is appropriate to briefly note that transcranial magnetic stimulation (TMS) is also a brain stimulation therapy applicable to TRD in the geriatric population but is more controversial from an efficacy standpoint; some studies

have suggested unambiguous efficacy[69,70] whereas others indicate an inverse relationship between age and efficacy, suggesting relatively lesser utility in the elderly.[71,72]

PROGRAM DESCRIPTION

The Department of Psychiatry at Virginia Commonwealth University Health System (VCUHS) provides a Brain Stimulation Therapy Program which includes clinical, educational, and research components. The clinical service is located within the medical psychiatry inpatient division and includes a dedicated ECT suite and four beds. Other components of this program not described here include TMS therapy located in a dedicated TMS therapy suite, vagal nerve stimulation therapy, ketamine infusion for depression in collaboration with anesthesiology, and a research program of deep brain stimulation for depression in collaboration with the Department of Neurosurgery.

Patients referred to the ECT program are from the entire Commonwealth of Virginia spanning approximately 200 miles in width and 430 miles in length and a population of 8.5 million. Although the program at VCUHS is the largest in the Commonwealth, there are seven other programs offering ECT. In recent years, our program has been evaluating approximately 225 patients annually for ECT, 75% of which are outpatients. Typical inpatient referrals are for those with catatonia, psychotic depression, suicidality, and severe mania. About 175 of these eventually receive ECT. There are also approximately 25 patients receiving maintenance ECT annually. Between 20% and 25% of all ECT patients are above the age of 65 years. Both inpatients and outpatients receive a standard evaluation focused on ECT by a senior consulting psychiatrist (AKP).

The ECT evaluation, in addition to standard psychiatric elements, focuses on verifying the primary diagnosis, prior treatment history both during the past and present episodes, specific factors that favor ECT including weight loss, electrolyte imbalance, suicidality, mood congruent delusions, and catatonia. Factors increasing risk are also carefully gathered and reviewed. For example, cardiomyopathy, low ejection fraction, pacemakers, bradycardia, risk of arrhythmia, and risk of aspiration and apnea. Depression is rated on the Montgomery–Asberg Depression Rating Scale (MADRS) on all patients.

Capacity to consent, surrogate consent in assenters without full capacity, and court permission for involuntary ECT are reviewed and implemented as appropriate. Logistics, schedule, transport, and supervision are especially reviewed for outpatients. All patients and significant others are shown an ECT video as well as provided with an ECT brochure, sample consent form, and outpatient safety instructions. Patients and family are encouraged to read the material and call back with any questions before the first treatment. Appropriate medical clearances are obtained as needed such as from a cardiologist or surgeon in patients who have undergone recent surgery. The minimum laboratory tests required before first ECT include complete hematology (complete blood count), comprehensive metabolic panel, and a 12-lead electrocardiogram (EKG). Additional tests are ordered on as needed basis. Outpatients and a family member receive a one-page outpatient ECT instruction sheet specifying taking *nil per os* after 12 midnight the night before ECT; taking morning medications with small sips of clear water; and seeking assistance of a responsible adult for transportation to and from the treatment session. Patients coming from other hospitals and nursing homes are expected to bring their complete medication list. Anticonvulsant medications, lithium, tricyclics, seizure-enhancing medications such as clozapine and bupropion are reviewed for doses and regimens, and individualized instructions are provided on whether to hold the medication, reduce dose, or continue the medication. More caution is exercised before the first four treatments, and subsequent changes are made based on patient response and safety events.

The procedure staff consists of a faculty psychiatrist/interventionist, two registered psychiatry nurses one of whom is in the treatment room, a psychiatry resident, a faculty anesthesiologist, and a certified registered nurse anesthetist (CRNA). Several other trainees may be present in the treatment room such as medical or nursing students. Significant others and family member are allowed to stay with patient until they are sedated. Pre-ECT evaluation is conducted before every treatment and includes assessment of current complaints, update of psychiatric and medical history since initial evaluation, review of systems, physical examination, review of medications, and laboratory blood draws. The patient is examined separately by the resident or nurse practitioner, attending psychiatrist and anesthesiologist.

Once in the treatment suite, the patient is connected to various safety monitors including EEG, EKG, electromyogram (one limb), oximetry, CO_2, tidal volumes, and blood pressure and heart rate. A time-out is called and documented to verify patient identity, procedure, lead placement, and electrical charge. Typically, sedation is achieved with 1 mg/kg of methohexital and muscle paralysis with 1 mg/kg of succinylcholine/kg. Alternative sedatives include etomidate and propofol. Alternative muscle relaxants are nondepolarizing agents such as rocuronium and mivacurium. Prophylactic medications are administered as needed and are jointly decided by the anesthesiologist and psychiatrist. Commonly administered medications include labetalol for blood pressure control, ondansetron for nausea, ketorolac for pain, and ranitidine to reduce gastric acidity. Atropine or glycopyrrolate is not administered unless there is a specific indication such as history of extensive secretion in a prior treatment. Oxygenation is provided by the CRNA. Vital signs are continuously monitored including heart rate, blood pressure, heart rhythm, oxygen saturation, CO_2, muscle activity in the left foot, and EEG. Upon obtaining sufficient sedation and muscle paralysis, electrical stimulation is administered through a Somatics, LLC, Thymatron IV machine. Electrode placement is determined initially by the psychiatric consultant who evaluates the patient, then on an ongoing basis by the psychiatrist/interventionist. Patients with MDD are typically started with RUL and brief pulse width of 0.5 ms and a charge based on the half-age method. If necessary, the charge is titrated up at each treatment, to obtain a seizure of at least 25 s on the EEG. After 4 treatments, patients are reevaluated

Figure 1: Electroconvulsive therapy procedure expandable e-form

ECT history, procedure and progress note - VCUHS

Name, DOB, MRN
Treatment number (index/maintenance)
Most recent consent date
Diagnoses (psychiatric)
Diagnoses (medical)
Rating scales (optional)
  Befor 1st ECT: Complete the applicable scale of psychiatric symptoms (MADRS or GDS or YMRS) + MMSE and CGS
  Every 4th ECT or every 4 weeks and after the last ECT: Complete the applicable scales and CGS/CGI
Insert rating scale here: Click on rubber stamp to insert appropriate rating scale
Psychiatric status
  Note brief history, any changes since last ECT in symptoms, stressors, life situation (obtained from patient, escort, and record)
Medical status
  At 1st treatment, note status pre-ECT; then any changes since last treatment in symptoms, function, and new problems (ROS)
Focused physical exam
Vital signs
HEENT
Cardiac
Resp
Abdomen
CNS
Pain — Pain score (0-10)
Labs, EKG, radiology and other tests: Note baseline at 1st ECT; then any changes since last ECT
Current medications: Verified with patient, family or escort and most recent records
Psychotropics (include dose) — Nonpsychotropics (list)
ECT treatment record - VCU health system
Today's treatment date
Today's treatment time
Attending psychiatrist
Assistants
Description of procedure
Today's treatment setting
  Inpatient
  Outpatient
Treatment course
  Index (I) — Treatment number
  Maintenance (M) — Treatment number
Electrode placement
  Right unilateral (d'Elia)
  BT
Left ant-right temporal
  Bifrontal
Medications administered: Include dose given
  Lorazepam — mg
  Atropine — mg
  Caffeine — mg
  Esmolol
  Etomidate
  Glycopyrrolate
  Ketorolac
  Labetalol
  Methohexital — mg
  NTG
  Ondansetron
  Propofol

Contd...

Figure 1: Contd...

ECT history, procedure and progress note - VCUHS

  Succinylcholine — mg
  Versed
  Other
Seizure duration
  Motor — s
  EEG — s
Vital signs
  Maximum HR
  Maximum BP
Adverse events
  None
  Yes
  If yes, describe
Other
  Estimated blood loss
  Specimen(s) removed
Comments
Changes for next ECT
Thymatron system settings/readings

Date		EEG endpoint	Sec
Time		EMG endpoint	Sec
Percentage energy set	Percentage	Base HR	b/m
Charge delivered	mC	Peak HR	b/m
Current	A	Average seizure energy index	µV2
Stimulus duration	S	Postictal suppression index	%
Frequency	Hz	Maximum sustained power	µV2
Pulse width	ms	Time to peak power	Sec
Static impedance	Ohm	Maximum sustained coherence	%
Dynamic impedance	Ohm	Time to peak coherence	s

Above thymatron system settings/readings were verified for accuracy with (name/title): _____
Attending physician review, findings and plan
Condition at discharge from ECT recovery — ECT service
Behavior
Orientation
Vital signs
Stable for D/C
Return date

ECT: Electroconvulsive therapy, YMRS: Young Mania Rating Scale, MADRS: Montgomery Asberg Depression Rating Scale, GDS: Geriatric Depression Scale, MMSE: Mini-Mental State Examination, VCUHS: Virginia Commonwealth University Health System, CGI: Clinician Global Index, EKG: Electrocardiogram, BT: Bitemporal, EEG: Electroencephalogram, HR: Heart rate, BP: Blood pressure, CNS: Central nervous system, NGT: Nitroglycerin, CGS: Clinician's Global Scale, ROS: Review of Systems, HEENT: Head, Eyes, Ears, Nose, Throat

and changed to BF placement if the progress is deemed insufficient. Patients with more pervasive pathologies including mania and catatonia are initiated with BF lead placement. Bitemporal (BT) lead placement is used if the first eight treatments (RUL × 4, BF × 4) for MDD) or four treatments (BF × 4 for psychosis) do not produce an adequate response, defined as 50% reduction in MADRS score or global improvement in psychosis/mania as judged by the treating psychiatrist. Caffeine benzoate 250 mg is

administered intravenously to those patients who exhibit a limited or no seizure in the prior treatment, 5 min before the planned electrostimulation. For postprocedure agitation, midazolam or lorazepam is used.

Except for the psychiatrist summary, documentation of the procedure occurs more or less contemporaneously in the electronic hospital record (Cerner Millennium) through conveniently located work stations. We have developed an ECT progress and procedure form into which all data are entered [Figure 1].

For patients with MDD, MADRS scores are recorded before initiating treatment, before every 4th treatment and upon the day of discharge from the ECT service. Adverse events are documented on the ECT procedure form. The faculty psychiatrist assesses progress in treatment, engages with families, and liaises with the primary treating psychiatrist throughout the ECT course and during maintenance ECT. Medication adjustments may be made by either the ECT psychiatrist or, when applicable, inpatient psychiatrist with electronic communication among the two as well as the patient and family. Typical modifications to pharmacologic management include withholding benzodiazepines; reducing the dosage or withholding of lithium and tricyclics; lowering or holding any antiseizure medication; reviewing doses of seizure enhancing medications (bupropion, clozapine, etc.); and administering medications to manage side effects such as pain and migraine medications. Cardiopulmonary and endocrine medications are not changed and are typically to be taken as usual on days of treatment. Insulin doses may be slightly increased during the course of ECT. Pacemakers are interrogated after each procedure by a cardiology technician. Anesthesiologists are responsible for airway and cardiovascular management until the patient successfully recovers from procedure.

Postprocedure, the patient is moved to a recovery area within the ECT suite with a registered nurse for 15–20 min during which there is continuous monitoring of vital signs, oxygenation, and orientation. Subsequently, the patient is moved to a room on the ECT unit and family members are invited to visit with the patient while the nurse continues checking vital signs, orientation, any complaints every 10–15 min for about 1 h. Patients who have received blood pressure lowering medications during the procedure may be observed for an additional hour to ensure there is no late drop in blood pressure. The intravenous (IV) access is maintained for all patients until released from the ECT Suite. Unless there is a specific medical indication, IV fluids or other medications are typically not ordered. However, in patients with catatonia as well as psychosis or depression with malnutrition, we do utilize the opportunity to provide hydration in the form of 750 mL of Ringer lactate or half normal saline over 6 h.

After ensuring that the vital signs are normal, orientation is consistently confirmed to self/time/place, and there are no acute complaints, the patient is released in the company of the escorting adult with the following instructions:

1. Mandatory: No driving or consuming alcohol for the day. Rest for 4 h. May engage in routine in-house activities. No working at heights or with any type of machinery. No open flame cooking. Next day: Mild in-house activities, if previously driving, then driving within neighborhood only with an accompanying person provided no medical or psychiatric symptoms including headache, dizziness, confusion, disorientation, chest discomfort, increased depression, suicidal thoughts, anxiety/panic, or hallucinations
2. Return to ECT with a responsible adult at a specified date and time
3. Medications: Individualized instructions
4. For any concerns or questions, the psychiatrist on-call is available 24/7.

The typical ECT schedule for the elderly patient without any cognitive impairment unrelated to depression (e.g., dementia or mild cognitive impairment) or major medical conditions (e.g., congestive heart failure or arrhythmia) is three times weekly. For those with such comorbid impairments, the schedule is typically two times weekly. Very infrequently, we have utilized once a week treatment for logistical reasons (e.g., transport or accompanying provider schedule) or medical reasons such as a history of confusion with duration >8 h.

MATERIAL AND METHODS

For the analyses included within this report, 59 unique patients over 65 years of age were identified as receiving ECT at the VCUHS Brain Stimulation Unit during the years of 2015 and 2016. Within this group, nine patients are described separately as they received maintenance therapy during the study period; data for this report were collected by review of the charts of the fifty patients by the first author (ADS). We gathered information on age, gender and racial distribution, number of treatments, placement of electrodes, charge administered, as well as subjective and objective indicators of outcome. We reviewed each procedure note for documentation of any adverse events. These included reported side effects by patients and families, observations made by the treatment team, and depression treatment scales (primarily MADRS) administered during the course of treatment.

RESULTS

Analyses were conducted on the fifty patients who received index or cluster treatments. Index treatment course is typically 10–12 treatments in length provided for a full episode of major depression or psychosis. Cluster treatment is a shorter course of 4–6 treatments in length and was provided for a partial relapse of symptoms, during the maintenance phase.

The average age was 71.6 ± 5.2 years. There were 24 males and 26 females. Thirty-three received index and 17 received cluster treatments. The most common psychiatric diagnosis was MDD (n = 36, 72%) followed by bipolar disorder (n = 13, 26%) and schizoaffective disorder (n = 1, 2.0%). The average number of treatments received was 10.

Overall, by report of patients and families, 42 out of 50 patients (84% of respondents) were significantly improved. The psychiatrist determined that 48 out of 50 patients showed some degrees of improvement in the target symptoms (96%). Using a modified 5-point Clinician Global Index, where −1= decline/worsening of symptoms; 0 = no change; 1 = minimal improvement; 2 = moderate improvement; and 3 = high/substantial improvement, psychiatrist determined average score was 1.98 ± 0.78. Thirty-four (68%) patients showed moderate or higher improvement. Paired initial and final MADRS scores were available however, for only 21 patients (42% of the sample); average initial scores were 28.2 ± 9.5 and final scores were 14.9 ± 7.8. The paired *t*-test result suggested a significant improvement after treatment ($n = 21$, $t = 6.792$, $P < 0.001$). Side effects associated with treatment were common including short-term memory loss ($n = 15$, 30%), headache ($n = 11$, 22%), transient cognitive impairment ($n = 7$, 14%), other central nervous system complaints (e.g., dizziness, fatigue, and irritability; n = 3, 6%), other pain ($n = 2$, 4%), and nausea ($n = 2$, 4%). Serious adverse events were not seen except in one case with transient bigeminy and sustained bradycardia requiring prolonged monitoring and cardiology consultation ($n = 1$, 2%).

The nine patients receiving maintenance ECT included five females and four males, with an average age of 72 years. Indications included MDD ($n = 3$), MDD with psychosis ($n = 2$), bipolar depression ($n = 3$), and atypical psychosis ($n = 1$). The number of maintenance ECT sessions received ranged from 2 to 90 with an average of 27 treatments during the maintenance phase, typically administered once a month. All of these patients maintained a moderate or higher level of improvement and hence M-ECT is being continued. Patients were taking various medications at the time of treatment which were managed by their own primary psychiatrist.

DISCUSSION

Our data appear to be consistent with findings in the literature in the sense that both subjective (82.3%) and objective (96%, mild improvement or better and 68%, moderate or better) improvement in depressive symptomatology appear to be on the order of the benefit reported elsewhere in the literature. Our data demonstrate significant overall reported improvement of about 50% in depressive symptomatology as measured by the MADRS during the index course. Incidence of side effects and adverse effects was also similar to[8] or lower than[9] reported in the literature. In the absence of any mortality or serious adverse events, our experience strongly argues for considering ECT in the treatment of the elderly in the treatment sequence of TRD. Although cognitive impairment is typically seen in 30% of the patients (literature and our experience), this has not proven to affect the patient's quality of life (QOL) significantly or resulted in lasting impairment. It should be noted that we did not use an extensive battery of neuropsychological tests or specific QOL scales which might have revealed more subtle impairments.

The strengths of the program include a structured organization of personnel with a physician as director (AKP) and a team of dedicated professionals to oversee all aspects of the program including quality, safety, regulatory and legal, human rights, patient selection, and outcome as well as the fiscal aspects. The thorough evaluation of referred patients from all over the Commonwealth of Virginia ensures verification of diagnosis and indication for ECT and procedures for appropriate consent, education of patient and significant other, and preparation for ECT. The follow-through by team members ensures compliance with visits, management of safety, adjustment in treatment plan, measurement of outcomes, and assistance with follow-up care. The thorough documentation allows for review and ongoing quality improvement. The program has received many accolades including a recent major donation from a grateful patient/family for training students and staff in ECT.

There are, however, several weaknesses to the program and the results reported here. In particular, capacity is limited by space and staff and wait periods can be 4 weeks long in nonurgent cases. One hour observation may not be sufficient. While fortunately there is no documented instance of a serious adverse event during the immediate hours after discharge, it may be prudent to extend the observation time to 2 h. Assessment of cognition is currently conducted by clinical judgment and administration of the Mini–Mental Status Examination; more sophisticated neuropsychological assessment may reveal subtler abnormalities. There is only anecdotal information on relapse after ECT without any formal monitoring.

The results reported here are from a program review for quality purposes and not a formal research study. They are susceptible to contamination and bias from factors that are not controlled such as concomitant therapies including medication, counseling, and varying levels of care (family, hospital, nursing home, etc.). Minor adverse effects such as transient agitation, headache, muscle soreness, and psychological complaints such as discomfort with the oxygen mask and paralysis before complete sedation are not strictly documented.

Numerous opportunities exist for improving our program as well as filling the gaps in the literature. By no means comprehensive or exhaustive, an arbitrary list of opportunities from a programmatic and service perspective includes (i) encouraging ECT programs to implement uniform assessment procedures, (ii) maintain a database and contribute data to a registry, and (iii) enhancing access to education for providers on the efficacy and safety of ECT in the elderly. From a formal research perspective, conducting studies on topics such as (i) use of RUL versus BL in nondepressed elderly patients such as those with catatonia and other psychotic disorders, mania, and agitation associated with dementia and (ii) efficacy of different schedule of ECT in the elderly using biweekly and triweekly schedules.

CONCLUSIONS

The literature and our experience strongly support the efficacy and safety of ECT in geriatric patients; however,

there are some factors unique to this population which beg further consideration when recommending this modality of treatment. A few examples have been mentioned above. Could the biological differences in brain tissue conductivity be corrected by the use of medical interventions such as preprocedure hydration, use of caffeine, or other stimulants? Perhaps improvements such as this and others mentioned in this manuscript could further improve the efficacy of ECT. Some authors noted that neurotropic effects of ECT may underlie its therapeutic benefit. Combined therapy with pharmacologic intervention along with brain stimulation was determined to be more effective than monotherapy, and maintenance therapy has demonstrated efficacy in limiting relapse. A variety of disorders including bipolar depression, dementia with severe agitation, mania, and schizophrenia may also be responsive to ECT.

Maximization of benefit and minimization of memory loss and other side effects through sequential RUL, then BF, and then BT placement is consistent with the adult population. ECT is accepted as a safe treatment modality even for patients with implanted implantable cardioverter defibrillators and other general medical problems after consultation with the appropriate specialists; however, the possibility of increased rate of falls, especially on the day of ECT, as well as induction of arrhythmias during and immediately after the procedure must be considered when clearing elderly patients for ECT. Accessibility is limited primarily not only by cost but also negative public perception in the United States. Controversies about capacity to consent and protection of human rights, the inherent challenges of involuntary ECT, as well as unfounded fears about disrupting the brain and mind through electrical stimulation likely result in the underutilization of ECT. Provider education is an important tool in enhancing access and referral; psychoeducation maximizes capacity to consent but may be difficult with patients suffering from comorbid psychosis or dementia. The viability of TMS as an alternative to ECT in the geriatric population continues to be evaluated.

Through an examination of the existing literature on this topic as well as a preliminary analysis of data gathered from our program at VCUHS, we advocate for the appropriate utilization of ECT when treating geriatric patients suffering from TRD and other refractory psychotic and manic conditions.

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Conflicts of interest

There are no conflicts of interest.

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