ECT in Texas: 19 Months of Mandatory Reporting

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Background: Texas law requires that all non-federal clinical facilities providing electroconvulsive therapy (ECT) report every treatment to the state's mental health agency. The resulting data provide total population information about treating physicians and hospitals; payment source; patient age, sex, ethnicity, diagnosis, and admission/consent status; symptom severity and response; numbers and types of treatments; and untoward events occurring within 14 days after treatment.

Method: We reviewed all reports of ECT between September 1993 and April 1995 (2583 reports, approximately 15,240 treatments).

Results: About 6% (N = 117) of Texas psychiatrists performed ECT during the period, at 50 hospitals. One of 13 state-funded mental institutions performed ECT on-site; some occasionally contracted with private hospitals. Almost all patients (88.1%) were white. Some older age groups received proportionately more ECT than younger groups, but no sharp increase was associated with eligibility for Medicare. Five patients were less than 18 years of age; 70.3% were female. Virtually all patients (99.0%) consented to the treatment themselves (rather than by guardian), including committed-but-consenting patients (1.5%). Reports (5.8%) described multiple-monitored treatment (MMECT, not depatterning). Group data indicated generally good-to-excellent response, as measured by a five-point symptom-severity scale. Eight patients died within 14 days of a treatment, 2 possibly of anesthesia complications and 3 others in accidents or by suicide. Four were receiving maintenance treatments (generally about every other week). No death appeared related to ECT stimulus or seizure.

Conclusion: ECT in Texas is performed by a small minority of psychiatrists and is unavailable to many patients who need it. It is most accessible to white patients who receive care outside the public sector. Our data support the common finding that ECT is generally safe and effective.

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Despite a large volume of clinical and research literature attesting to the safety and efficacy of electroconvulsive therapy (ECT),[1–12] it remains controversial to most laypersons and many physicians. This paper presents new data, from a large patient population, which were collected via compulsory reporting, not voluntary survey. Although it is virtually impossible to achieve consistent reporting outside a highly controlled setting, these findings from routine clinical practice complement other kinds of investigations.

In 1993, amid scandal among private psychiatric hospitals and concerns about the rights and care of psychiatric patients, the Texas legislature passed a bill requiring the Department of Mental Health and Mental Retardation (TDMHMR) to regulate ECT procedures, consent processes, and stimulus equipment more closely. Except for federal jurisdictions, certain information regarding all ECT performed in Texas is now reported to TDMHMR, with summary data provided periodically to the governor, lieutenant governor, and legislative leadership[13,14] (copies of these data are available from W.H.R. upon request).

METHOD

Data were collected, via a mandatory reporting form, for all ECT performed in non-Federal settings in Texas during the 19-month period from September 1, 1993, through March 31, 1995. Each report describes a single patient's treatment with an index series (to manage an acute episode of illness) or maintenance ECT (to prevent return of symptoms), or both. Reports were to be submitted within 30 days after each ECT series or, in the case of maintenance ECT, on quarterly reporting dates. The reporting form (available from W.H.R. upon request) contains items required by Texas statute as well as others considered useful to the Department, including geographic/

facility data for treating and attending physician(s); make/model of stimulus equipment; primary source of payment for ECT; patient age, sex, ethnicity, and admission and consent status; diagnosis; fracture, unexpected apnea, cardiac arrest, or death occurring during ECT, while the patient was actually receiving a treatment; fracture, unexpected apnea, cardiac arrest, or death within 14 days after ECT; autopsy reports for deaths within 14 days of treatment, if available; global appraisal of symptom severity before and 2–4 weeks after treatment; global appraisal of memory function before and 2–4 weeks after last treatment; total number of treatments during the past 3 months; total number of treatments during the past 12 months; number of maintenance and nonmaintenance treatments; type of treatment (unilateral/bilateral/mixed); completed versus prematurely discontinued treatment; use of multiple-seizure ECT (> 1 seizure per treatment); and use of regressive or depatterning ECT.

Every Texas psychiatrist and licensed hospital received notice of TDMHMR ECT regulations and reporting requirements, as well as periodic clarifications and, as necessary, follow-up of significant reporting problems or errors. Because of misunderstandings about the definition of "multiple monitoring" (MMECT), the Department sent special notices defining MMECT as multiple seizures during one anesthesia episode, not routine physiologic monitoring of patients. All reports of MMECT were followed up by telephone or in writing to be certain the data were correct. Additional follow-up information was obtained from attending/treating physicians and other clinical staff regarding the 8 patients who died within 14 days of treatment.

The actual closing date for data collection was 12 weeks after the end of the 19-month index period, to allow for late reporting. The dates of treatment are all within the index period.

RESULTS

A total of 2583 reports were received, 1741 reporting an index treatment series, with or without maintenance ECT follow-up, and the remainder reporting solely maintenance ECT. The mean number of treatments covered by each report, maintenance or index series, was 5.9. The total number of treatments covered by all reports was approximately 15,240. In instances in which the number of patient/report totals were fewer than 2583, some parts of the reporting form were not applicable to all patients and some blanks were occasionally left unfilled.

Hospitals and Doctors

Fifty hospitals submitted reports of ECT. This figure represents about one third of Texas's 63 psychiatric hospitals and 90 general hospitals with separate psychiatric units. The number of reports per hospital over the 19 months ranged from 1 to 229, with a mean of 51.7. Eight hospitals submitted over 100 reports; 6 submitted fewer than 10.

ECT was performed by a total of 117 physicians, about 6% of the approximately 1900 psychiatrists in the state. We believe, but cannot verify, that all physicians performing ECT were psychiatrists: one hospital reported its physicians by number rather than name. The number of reports (not necessarily patients) per physician ranged from 1 to 172, with a mean of 22.0. Fifteen physicians were treaters in 50 or more reports; 49 were listed in fewer than 10 reports.

Table 1. Patient Demographics

Characteristic	ECT Patients N	ECT Patients %	General Population of Texas[a] %
Age (y)			
16–17[b]	5	0.2	3.0
18–24	50	1.9	11.1
25–44	628	24.4	33.1
45–64	644	25.0	17.2
≥ 65[c]	1244	48.4	10.1
Sex			
Male	767	29.7	49.3
Female	1812	70.3	50.7
Race			
White	2267	88.1	60.6
Hispanic	201	7.8	25.5
Black	85	3.3	11.6
Asian	14	0.5	1.8
Other	6	0.2	0.4
Admission/consent status			n/a
Voluntary	2498	97.5	
Involuntary/consenting	39	1.5	
Involuntary/guardian's consent	24	0.9	
Primary payment source			n/a
Private third party	990	39.1	
Public third party[d]	1445	57.0	
Self/family	83	3.3	
Other	17	0.7	

[a]Source: 1990 U.S. census data and U.S. Census Bureau database file C90STF1A.
[b]ECT may not be given to persons less than 16 years old in Texas.
[c]At least 226 patients (8.8%) were over 80; 8 (0.3%) were over 90. A few early forms listed age by interval only (e.g., 45–64, 65+).
[d]Includes Medicare.

Diagnosis

The majority of ECT was prescribed for depressive illness. Almost 90% of patients had a severe mood disorder (a small minority of which were manic type). Just under 10% of patients had a schizoaffective, schizophrenic, or related diagnosis. In about 2%, the reported diagnosis was an organic affective syndrome, mood disorder due to a general medical condition, or dementia (with depression, or rule-out pseudodementia).

Patient Demographics

Table 1 describes age, sex, race, admission/consent status, and the primary payer for patients receiving ECT during the reporting period.

Table 2. Number of ECT Treatments

Treatment	N	%
Number per index series[a] (mean = 4.9)		
1–6	845	48.5
7–10	645	37.0
11–15	216	12.4
> 15	35	2.0
Number of index series completed		
Completed	1593	87.9
Interrupted	219	12.1
Total past 3 mo (mean = 5.9)		
1–15	2334	97.8
16–20	41	1.7
21–30	9	0.4
> 30	2	0.1
Total past 12 mo (mean = 10.7)		
1–15	2031	79.9
16–20	240	9.4
21–30	201	7.9
> 30	69	2.7

[a]These values do not include maintenance ECT treatments.

Table 3. Treatment Characteristics

Characteristic	N	%
Electrode placement		
Bilateral	1838	73.2
Unilateral	467	18.6
Mixed	207	8.2
Multiple-Seizure ECT[a]		
No	2369	94.2
Yes	147	5.8

[a]Defined as at least one treatment with more than one seizure.

Table 4. Global Symptom Severity

	Before ECT Treatments		2–4 Weeks After Series or Last Treatment	
Severity	N[a]	%	N[a]	%
None[b]	21	1.0	429	18.0
Mild[b]	116	5.8	1412	59.3
Moderate	0	0.0	475	20.0
Severe	1420	70.7	57	2.4
Extreme	451	22.5	7	0.3

[a]Difference in total N before and after treatment reflects omissions on reporting forms.
[b]Patients in the None or Mild category prior to treatment are assumed to have been in remission and receiving maintenance treatments.

Number and Types of Treatments

Table 2 describes the number of treatments for patients receiving either a series of treatments or maintenance ECT. Table 3 summarizes electrode location and multiple monitored ECT.

Symptom Severity and Improvement

Global symptom severity and/or disability was estimated by the physician before and after treatment, using a five-point scale. The group results are summarized in Table 4. These data should be interpreted with caution, since clinicians were not asked to measure symptoms or improvement in any controlled fashion.

Table 5. Global Memory Dysfunction

	Before ECT Treatments		2–4 Weeks After Series or Last Treatment	
Dysfunction	N	%	N	%
None	851	33.7	618	25.8
Mild	848	33.6	1260	52.7
Moderate	530	21.0	438	18.3
Severe	254	10.1	65	2.7
Extreme	41	1.6	11	0.5

Table 6. Untoward Events*

	During a Treatment			Within 14 Days Following Last Treatment		
Event	N	% Reports[a]	% Treatments[b]	N	% Reports[a]	% Treatments[b]
Fracture	0	0.00	0.00	0	0.00	0.00
Unexpected apnea	2	0.08	0.014	1	0.04	0.007
Cardiac arrest	0	0.00	0.00	0	0.00	0.00
Death	0	0.00	0.00	8	0.31	0.05

*Note that reporting of these events does not imply that they were caused by or related to ECT or accompanying procedures, but simply that they occurred during a particular time period.
[a]Percentage of quarterly or series reports that contained a notation of the untoward event.
[b]Approximate percentage of occurrence per treatment (report percentage divided by 5.9).

Global Memory Function

Clinicians were asked to estimate global memory before and after treatment, using a five-point scale. The group results are summarized in Table 5. These data should be interpreted with caution, since clinicians were not asked to measure memory in any controlled fashion, and there may be response bias related to overall patient improvement.

Untoward Events

The four types of reportable untoward events—fracture, unexpected apnea, cardiac arrest, and death—are summarized in Table 6. It should be noted that the occurrence of an untoward event does not imply that it was caused by or related to the ECT; it is thus inappropriate to refer to these as adverse effects.

Deaths Within 14 Days of ECT

The eight deaths that occurred within 2 weeks of an ECT treatment were investigated by the senior author using telephone calls and, in some cases, chart records. All treating physicians and hospitals appeared to cooperate with our follow-up efforts, although no attempt was made to verify records or statements received. In two cases, one apparently related to anesthesia complications, the event that led to death occurred on the same day as the ECT. Others occurred later, most appearing clearly unrelated to the procedure. Autopsy reports were reviewed when available, but detailed postmortem examination was not generally performed.

Two patients were between 45 and 65 years old; the remainder were over 65. All patients were white; five were female. Four of the eight patients had been receiving maintenance ECT (an average of about one treatment every other week). Two patients, both elderly, had had MMECT (two treatments during one anesthesia episode). Autopsy results were available in one case; in two others, the family declined autopsy. In a fourth instance, the treating physician's request for an autopsy was denied by the local coroner.*

Two of the patients who expired within 14 days committed suicide. Another was a passenger in a fatal automobile accident. A fourth died of an apparently unrelated cardiac event a few days after uneventful anesthesia and ECT. That patient had had preexisting cardiopulmonary disease and had experienced ECT many years ago with good response. A fifth patient had a massive myocardial infarction at home several days after treatment.

A sixth patient had a heart attack in the recovery room after apparently uneventful ECT. This patient had been receiving maintenance ECT for many years without incident and was doing well. There was a long history of major depression and previous heart attacks, and the patient was under care of a cardiologist. A seventh patient had excessive confusion following otherwise uneventful MMECT and anesthesia. The patient became hypotensive 12 to 16 hours after the last treatment and eventually died of probable pulmonary embolism. He had had ECT 8 years before with good results, with maintenance treatments twice a month. The depression eventually recurred, and the patient had three two-seizure treatments over 4 days prior to his death.

The eighth patient was an elderly professional person with a history of several strokes and extreme depression that responded to ECT. He had been maintained for many years on approximately weekly maintenance ECT. The history indicated that he was unable to function without ECT, but with it had good response and could carry out most professional duties. The patient developed an infectious illness unrelated to ECT, refused heroic measures, and died of a massive stroke.

DISCUSSION

Considerable effort was made to be certain the Texas ECT reporting regulations were met and every ECT experience reported; nevertheless, it is possible that a few patients may not be represented in these data. In addition, the patients who received ECT do not represent all who were clinically eligible for it, since patient choice, physician preference, administrative inconvenience, and elaborate consent policies no doubt affect both the prevalence of the treatment and the distribution of those who receive it (cf., voluntary vs. involuntary patients, public vs. private, insured vs. uninsured, white vs. minority).

Access to Treatment

It is interesting that only 1 of Texas's 13 state-funded inpatient psychiatric facilities (8 state hospitals, 3 state centers, 2 urban acute-care psychiatric hospitals) provides ECT on-site. At least 2 others occasionally refer patients to local private hospitals for the treatment; however, in spite of large numbers of patients with severe or intractable affective symptoms or psychosis, it is difficult for state hospital patients to get this treatment. Similar concern must be raised about the small number of committed inpatients who received ECT. Almost all Texas state hospital patients are initially involuntarily hospitalized; conversely, most private hospital patients are voluntary. The authors believe that part of the explanation lies in the general atmosphere of suspicion that still surrounds ECT within the lay community and which is fostered by adverse media portrayals and statements from anti-ECT groups and individuals. Further reasons may be found in Texas's complex consent process, which makes it extremely difficult for a psychotic or incompetent patient to qualify for the treatment without extensive guardianship procedures. This problem is not new; incompetent patients have often been denied ECT, even as a treatment of last resort.[15]

Access to care is also an issue when considering race and ethnic background. Our data appear to indicate that, in a state with significant numbers of Hispanic, black, and Asian residents, white patients are much more likely to receive ECT. Examination of this issue is beyond the scope of this paper; however, it is tempting to suggest that this discrepancy is primarily related to differential access to private-sector treatment (although patients over 65 might all be expected to have similar access to private treatment through Medicare).

Our group data on improvement in symptoms/disability and on memory function agree generally with studies that have examined these parameters more specifically,[2,9–11,16,17] particularly when one recognizes the frequent association between memory and other cognitive deficits and severe depression per se. That is, severe depression adversely affects memory and causes people to perform poorly on tests of cognitive ability. It should be noted that for these two measures, clinicians were asked for overall (often retrospective) assessments, without further instructions or follow-up to determine the accuracy or reliability of the clinical assessment.

*Although Texas state law now requires autopsy for deaths within 14 days of ECT, many (perhaps most) of the eight deaths occurred under circumstances for which no clinical need for autopsy was perceived by the local doctor or hospital. They, and even the local coroner, are likely to have been unaware of the patient's past ECT and/or of the statutory autopsy requirement.

Perceptions of Overuse of ECT in Certain Populations

There is considerable reason to doubt media reports and ECT opponents who suggest that an unjustifiably disproportionate number of women, elderly patients, and minority patients receive ECT. Although it is not our purpose to examine or defend ECT in these particular groups, a brief discussion is warranted.

Slightly more than twice as many women as men received ECT during the period covered by our report. There are several possible explanations for this apparent imbalance. First, a number of studies indicate that severe depressive episodes, the most common indicator for ECT, are roughly twice as common among women than men.[11,18] Postpartum mood disorders can be particularly dangerous for patients and others and require vigorous treatment that may include ECT. Further, women live several years longer than men, on average, and thus have considerably more opportunity to develop late-life depressions (or to have additional episodes of preexisting mood disorders). Finally, some authors have suggested that women may be more likely than men to recognize and seek treatment for psychiatric disorders.

Almost half (48.4%) of all ECT reports during the period studied involved persons aged 65 or over (who make up just over 10% of the Texas population). Although critics cite this as evidence of exploitation of the elderly, ostensibly for their Medicare insurance coverage, a closer look at the data and at clinical indications for ECT and other psychiatric treatments strongly suggests otherwise. First, mood disorders tend to be recurrent; those who have them earlier in life often have a relapse late in life, and their numbers are added to those who develop depression de novo in their seventh or eighth decade. Second, as patients get older, the relative safety and efficacy of ECT compared with antidepressant medications increase. For many elderly patients, the prospect of chronic medication—which may interact with other drugs commonly prescribed for older people—is a much greater risk than series or maintenance ECT for severe mood syndromes. Third, antidepressant medications are often poorly tolerated in the elderly, some, for example, causing anticholinergic delirium or exacerbating cardiac arrhythmias at usual doses.

In addition to these clinical arguments against the perception that ECT is overused in older patients, a year-by-year examination of patient age versus number of ECT reports in Texas showed no meaningful increase in ECT at age 65 (when Medicare becomes available). The percentage increase in reported treatments between age 64 and age 65 ranked 14th compared with all other age pairs in which there was an increase, and was less than half the increase found between ages 23 and 24, 30 and 31, 37 and 38, and 69 and 70.[19]

Our data clearly dispute any suggestion that ECT is overused among minority populations. Indeed, we are concerned that minority patients do not have access to ECT as part of a complete array of possible treatments for severe mental illness. While this may be due in part to lack of insurance and the larger proportion of black and Hispanic patients whose care falls to the public sector (where ECT is arguably far less available), it does not fully explain their underrepresentation among older, Medicare-covered patients and in groups covered by employer insurance or managed care plans. We do not know the extent to which this lack of treatment may be attributed to patient preference (i.e., minority patients declining ECT when it is offered), physician attitude or education (e.g., their psychiatrists not offering ECT or psychiatric care being given by primary care physicians who are not familiar with it), and/or actual unavailability of the treatment in treatment settings with large numbers of minority patients.

Safety and Relative Risk of ECT and ECT Anesthesia

Two of the deaths, called the “sixth” and “seventh” in the Results section, appear possibly associated with the anesthesia or other procedures unrelated to the stimulus itself. There is no indication that the stimulus or attenuated seizure triggered complications in either case. In the sixth patient, who had a history of past myocardial infarction, general anesthesia of any kind must be considered a risk factor. In the seventh patient, there is no direct indication that his hypotension or apparent pulmonary embolism was related to any part of the procedure, and there was no known contraindication prior to ECT.

It is very important to consider the relative risk of ECT (or any other treatment) for seriously ill patients. The sixth patient appears to illustrate that the concept of risk-benefit ratio always includes a potential for adverse outcome, but—perhaps most important—that ratio is almost never a choice between risk and no-risk. He suffered from at least two serious, potentially fatal, illnesses (cardiac disease and major depressive disorder), both of which required treatment. The risks of antidepressant medication included adverse effects on his cardiac health and a likelihood that the drugs would be ineffective. The risks of ECT included a somewhat lower potential for adverse cardiac effects and a considerably lower probability that it would be ineffective for his severe depression (especially given his history of responding well to ECT).

The seventh patient was described as having three two-seizure treatments over 4 days, followed by an unusual level of confusion, a hypotensive episode 12 to 16 hours later, and eventual death. Some readers may view his treatment as similar to so-called “regressive” or “depatterning” ECT; however, it was not reported as such, and there is no indication that regression or depatterning was intended by the treating psychiatrist. Rather, the series was described

as using multiple seizures to promote more rapid recovery in an extremely depressed patient.

CONCLUSIONS

This report represents an unusually complete survey of ECT use in a large U.S. population and offers a much needed dispassionate view of ECT demographics. We are aware that anti-ECT groups have used the publicly available TDMHMR data to support their contentions that ECT is dangerous and unnecessary and to campaign in the Texas legislature to ban the treatment altogether. We believe that those groups have often misinterpreted and/or misused the TDMHMR data. We hope that this paper promotes objective discussion among clinicians, patients, families, and those who influence patients' access to this important treatment modality.

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