
ELECTROCONVULSIVE THERAPY IN THE MEDICALLY ILL: EXPERIENCE AND GUIDELINES

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ALMOST half a century has passed since electroconvulsive therapy was added to psychiatry's therapeutic armamentarium. In that time it has proved itself a safe, swift and most effective treatment for specific categories of depression and psychosis. As a result of the American Psychiatric Association Task Force Report on Electroconvulsive Therapy and the recently published National Institute of Mental Health Consensus Report on Electroconvulsive Therapy (1986), interest in this procedure has revived. Many past findings are being reexamined using more refined techniques and systematic study.¹ Growing alarm concerning the drawbacks of psychotropic medication has also played a role in this current renaissance of interest in electroconvulsive therapy. The major tranquilizers can indeed control acute psychotic symptoms but they can also cause tardive dyskinesia. Antidepressants and lithium have contributed greatly to the management of affective disorders, but they can also cause electrocardiographic changes, postural hypotension, hypertensive crises, hepatopathy, endocrinopathy, and nephropathy. The more we learn about these medications the more we are compelled to moderate our early enthusiasm. This is particularly true of psychiatric patients with severe physical illness.

There have been few recent reports concerning the use of electroconvulsive therapy in the medically ill. The early papers are largely anecdotal. For example, it has been used safely with patients having severe cardiovascular disease including recent myocardial infarction, aortic grafts and aneurysms, cardiac pacemakers, congestive heart failure and hypertension;²⁻¹⁸ central nervous system disease including brain tumors, recent cerebral vascular accidents, multiple sclerosis, epilepsy, general paresis, head injuries, delirium of different etiologies, Parkinson's disease and others;¹⁹⁻²⁹ and such other

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disease entities as systemic lupus erythematosus, idiopathic thrombocytopenic purpura and postrenal transplantation.³⁰⁻³²

It is important to note that among these reports there are few systematic studies of the use of electroconvulsive therapy in the medically ill. The prevailing anti-ECT climate is even more hostile in relation to physically impaired patients. The reluctance of physicians to prescribe this modality for seriously medically ill patients has resulted in unwarranted prolongation of inpatient care. Concern with problems of cost containment and the current focus on "diagnosis related groups" in calculating inpatient costs give additional significance to these issues. Since mental illness in general and depression in particular effect vast physiological upheavals in the internal milieu and may, in addition, drastically impair the patient's capacity to cooperate for medical-surgical care, rapid relief of the mental disorder may be life-saving.

This paper reports a series of patients with grave medical disease who received electroconvulsive therapy at Mount Sinai Hospital in New York City over a three-year period in an attempt to clarify risk/benefit issues.

METHOD

For this report we studied the charts of 327 consecutive patients over a three-year period, treated with succinyl-choline modified bitemporal electroconvulsive therapy. We have selected for closer study those patients whose clinical picture was complicated by such serious medical illnesses as recent myocardial infarction, aneurysm, carotid artery grafts, recent cerebral vascular accidents, spontaneous subarachnoid hemorrhages, pacemakers, and cardiac arrhythmias. We have deliberately ignored the more commonly encountered conditions such as mild to moderate osteoarthritis, hypertension, arteriosclerotic heart disease, glaucoma, chronic obstructive pulmonary disease, recent fractures, and advanced pregnancy.

The patient is not permitted to eat or drink after midnight on the night before treatment. Dentures are removed before therapy. Loose or poorly spaced teeth are cushioned by a sponge. If dentition is adequate, an Oberto mouth prop is used. The patient is asked to void prior to treatment to avoid incontinence. We try to keep the personnel in the treatment unit constant; they are usually familiar with the patient and are better able to allay anxiety during the pre- and posttreatment phases.

We use a scalp vein infusion set to administer the medication, because the polyethylene tubing allows us to change syringes without displacing the nee-

dle once it has been threaded into the vein and later serves as an open line. Atropine sulfate (0.8 mg) is given first, for its vagolytic effect. Only the narrow angle type of glaucoma is of concern if atropine is used, but patients with glaucoma should not be using echothiophate iodide, because it causes excessive delay in muscle repolarization following succinylcholine paralysis. The second medication administered is a 1% solution of methohexital sodium, a rapid, ultrashort-acting barbituate that we inject (40 mg to 70 mg) slowly to induce unconsciousness. Care should be exercised to insure that none of the highly alkaline barbituate is injected extravascularly. Succinylcholine is then injected (30–60 mg) to produce a flaccid paralysis. An anesthesiologist hyperventilates the patient prior to the treatment and supports the patient until spontaneous respirations have resumed. Paralysis is of short duration and the medication is of low toxicity. The scalp vein is left in place until the patient has stabilized. The patient is then turned on his side and monitored in the recovery area.

RESULTS

Approximately 12% of our cases qualified for our criteria of severe medical illness. It will be noted that no serious untoward effects were observed in our series of physically ill psychotic patients.

DISCUSSION

The authors do not suggest that medically ill patients can be treated with impunity. The risk/benefit ratio may be difficult to determine and the advice of an experienced consultant is required. Clear-cut contraindications for electroconvulsive therapy include an expanding intracranial lesion, a current intracranial bleeding episode, an ongoing myocardial infarction, the inability to insure that the patient has had nothing by mouth for six hours prior to treatment, and concurrent use of rauwolfia alkaloids. In treating severely hypertensive patients we seek to reduce the pretreatment blood pressure level to below 180/100. In the case of hyperkalemic patients it is necessary to reduce potassium blood levels to normal since the effect of succinylcholine is to raise, further, blood potassium levels with concomitant additional risk.

We treated patients with various heart conditions, aortic valve replacement, aortic stenosis, and arteriosclerotic heart disease with premature ventricular contractions. Perhaps our most difficult problem involved a patient who suffered a myocardial infarction only five days before treatment and yet survived the procedure with great benefit. We routinely attempted to reduce

cardiac and cerebral stress by hyperoxygenation prior to the induction of methohexital anesthesia. Depending on the seriousness of the patient's physical condition the patient might be retained for longer periods of observation time in the recovery area. We decided to treat some patients in the operating room-recovery room rather than the regular electroconvulsive therapy area because of the greater availability of staff and life support systems. However, we want to emphasize again that the dangers of physical exhaustion in states of psychotic excitement, associated with sleeplessness, dehydration, and severe electrolyte imbalance usually presented greater dangers than those posed by electroconvulsive therapy itself. In many cases it seemed that there was much to lose by ill-advised treatment delays. The seeming simplicity of oral or even intramuscular medication may also lead to unfortunate treatment delays. Because it is easier to prescribe a pill than to administer electroconvulsive therapy, one often believed that the pill was also safer, notwithstanding that an antidepressant pill can further impair an already compromised cardiac conduction system or that it might lead to orthostatic hypotension, resulting in serious and even fatal falls. Thus, in specific instances of physical illness complicated by severe psychotic excitement, electroconvulsive therapy is not the treatment of last resort. Rather, it is the treatment of choice, to be preferred to the psychotropic medications, for example, in a patient reduced to a state of dehydration and inanition by his depressive disorder, which was so severe that one could not temporize during the weeks involved in waiting for drug induced remission. One of our patients developed hypercalcemia associated with dehydration. Electrolyte balance was swiftly restored by appropriate intravenous fluids; and electroconvulsive therapy was then applied without incident. A cachectic patient suffering from schizoaffective disorder complicated by anorexia nervosa gained twenty pounds very quickly after an electroconvulsive therapy induced improvement.

Patients with severe medical illnesses should receive therapy in a properly equipped hospital setting, with trained staff in attendance. A review of the treatment procedure as outlined in Chapter 5 of the American Psychiatric Association Electroconvulsive Therapy Task Force Report is recommended. The advantage of a general hospital setting is the availability of maximal medical support prior to, during, and after each treatment.

It has been the experience of several investigators that the use of unilateral electroconvulsive therapy requires a greater number of treatments. We believe that reducing the total number of exposures to general anesthesia and

succinylcholine in the severely medically ill patient is important. Hence our reliance on bilateral administration. The anesthetic risk outweighs any advantage to be derived from reduction in transient memory impairment.

It is sometimes difficult to be sure that a therapeutically effective grand mal seizure has indeed been induced when the patient's muscular system has been paralyzed with succinylcholine. This question is definitively answered by an electroencephalographic monitor. However, when such monitoring is not available, compressing one of the extremities with a blood pressure cuff prior to succinylcholine injection makes it possible to observe the grand mal pattern in the vascularly-isolated limb. In treating a patient with a fresh fracture, even the minor muscular fasciculations of a properly paralyzed patient may suffice to displace a fractured bone fragment. In such cases a non-polarizing paralyzing agent may be used instead of succinylcholine.

In view of all the foregoing considerations, it is imperative that education and training in electroconvulsive therapy be upgraded. To this end we propose the establishment of regional centers. Such centers would provide, first and foremost, settings of maximal safety for patients with serious physical illnesses. Second, these centers would be settings to provide optimal training for personnel to staff facilities elsewhere. Finally, such centers could organize nationally coordinated research programs to further our understanding of this important treatment modality.

SUMMARY

After a half century, electroconvulsive therapy has proved its worth in treating specific categories of depression and psychosis. During the same time some serious drawbacks have been ascertained in treating these conditions with psychotropic drugs, and a renaissance of interest in electroconvulsive therapy has occurred. We explored the risk/benefit ratio in the treatment of psychiatric patients with severe physical illness. A series of 327 consecutive psychiatric cases were treated over a three-year period. Twelve percent of these qualified for our criteria of concomitant severe physical illness.

No serious untoward effects occurred in any of our psychiatric patients with severe physical illness. In our opinion, for many psychiatric patients with severe physical illness, electroconvulsive therapy is not the treatment of last resort, but is the preferred treatment and it may be life-saving. We recommend the establishment of regional centers for treating patients with severe physical illness, for training and for coordinating nationwide research.

RESULTS

In our series of 327 patients, a total of 39 (12%) met our criteria for serious illness. In most of them, several organ systems were involved. For example, of 15 patients with arteriosclerotic heart disease, almost all of whom had frequent premature ventricular contractions, three were diabetic, one of whom had an infected post-leg-amputation stump, another had severe advanced osteoarthritis of the spine, and the third had bilateral macular degeneration. Two cardiac patients had pacemakers. Two had carcinoma of the prostate and two had benign obstructing enlargements of the prostate. One of the latter had a severe urinary tract infection with a cystotomy. One had severe urinary incontinence following prostatectomy, and one had Paget's disease; and one had carcinoma of the colon. Two of our cardiac patients had histories of severe myocardial infarction. One had had an aortic valve replacement and another had a marked aortic stenosis. One cardiac patient had had a recent bilateral iridectomy. This same patient had a severe hypertension and was also suffering from a recent hip fracture as well as bilateral macular degeneration and left-sided residua from a cerebral aneurysm which had ruptured 15 years before. Another diabetic patient had had a subtotal gastrectomy 25 years before and another had glaucoma and hypothyroidism. Of five patients with Parkinsonism, one had an associated organic brain syndrome; another was suffering from aspiration pneumonia and severe malnutrition; and another patient had both a mastectomy and a relatively recent myocardial infarction. There was a patient with paraparesis secondary to severe spinal osteoarthritis. Another patient had severe advanced multiple sclerosis. Another patient had both glaucoma and a posttraumatic seizure disorder. One patient had a left hemiplegia and a seizure disorder secondary to a cerebral vascular accident. This same patient had previously undergone surgery for an aortic valve replacement and for hyperthyroidism. There was one patient with severe malnutrition secondary to anorexia nervosa. Among five postmastectomy patients, two had generalized metastases and one had a right acoustic neuroma as well as a shunt for recurrent hydrocephalus. One patient had hyperparathyroidism with associated hypercalcemia, glaucoma, dehydration, and malnutrition. Two patients had Pagets disease and one had biliary cirrhosis.

Twenty-five of our patients had had prolonged unsuccessful treatment with a variety of antidepressant medications before electroshock therapy was instituted. Our patient with multiple-sclerosis had a severe exacerbation of her neurologic symptoms during a course of lithium therapy. Several of our pa-

tients with prostatic disease had experienced episodes of urinary retention as a complication of antidepressant medication. One of our successfully treated patients was suffering from an acute schizophreniform psychosis which started acutely during a course of chemotherapy and steroid in the treatment of a metastatic breast malignancy.

Of our 39 patients, one showed no benefit from electroshock therapy; one had a transient hypomanic reaction; two patients were moderately improved. The rest showed marked improvement in the psychotic picture following electroshock therapy.

		<i>Days in hosp.</i>		<i>Psychiatric diagnosis</i>	<i>Medical diagnosis</i>	<i>Psychiatric medications</i>	<i>Nonpsychiatric medications and/or procedures</i>	<i>ECT response</i>
<i>Age</i>	<i>Sex</i>	17	5	Depression	ASHD		Digoxin	Improved
		70	3	Depression	Elevated B.P.; diabetes; degenerative osteoarthritis of spine; U.T.I.; macular degeneration O.D.; hyperostosis	Dexedrine; phenobarbital, Mellaril, Navane. (None helped)	Reserpine for hypertension	Improved
		29	10	Depression	Suprapubic cystotomy; U.T.I.; dehydration.	No response to meds in past		Improved
		38	7	Schizo-affective psychosis	Bilateral iridectomy; diabetes; hypertension.	Acute dyskinesia after tranquilizers	Oral antidiabetic medication	Improved
		51	3	Depression	Parkinsonism; hypertension; malnutrition; ASHD with pvc's	Elavil Tofranil	anti-Parkinson medications	Improved with marked OBS
		31	8	Depression	Castroctomy, 1953; ruptured cerebral aneurysm, 1961.			Slight improvement
		28	6	Depression	Paraparesis lumbar osteoarthritis L4-5	Triavil	C.S.F. protein 310 mg%	Improved
		19	5	Depression	Hypertension; old L CVA			Improved

M	45	7	Depression	Wide angle glaucoma; hypothyroidism		Meds for hypothyroidism and glaucoma	Improved
M	82	14	Depression	Prostatic Ca; MI 3 yrs ago with persisting angina		Digoxin Nitroglycerine	Improved
F	53	8	Depression	Parkinsonism with "OBS"			Improvement in OBS and Parkinsonism
F	37	8	Depression	ASHD with cardiomegaly and clubbing			Improved
F	153	7	Depression with paranoid features	ASHD; CHF; pacemaker	Mellaril Haldol Benadryl Artane	Diuril Potassium salts	Improved
M	27	5	Depression	Parkinsonism; aspiration pneumonia; malnutrition.	Elavil helped sleep	Anti-Parkinson meds; suction & physiotherapy; antibiotics	Improved
F	21	6	Manic	Multiple sclerosis	Thorazine Lithium	M.S. worsened by lithium	Improved
M	52	6	Depression	ASHD; diabetic with infected right leg amputation at knee	Elavil precipitated psychotic reaction	Difficulty with insulin because of brittle diabetes (frequent shocks)	Improved
F	97	5 & 5	Depression	Hypertension; ASHD with chronic failure; malnutrition; pulmonary edema	Unresponsive to medication. Good response to ECT in past	Refractory to digitalis. Transferred to med service. After cardiac improvement, given 2nd series of ECT	Improved

F	35	8	Depression	Post-traumatic epilepsy; glaucoma	Tricyclic meds were not helpful	Iridectomy right eye	Improved
F	137	14	Schizo-affective; anorexia nervosa	Inanition due to anorexia nervosa	Prolixin Artane	Attempted suicide with thyroid overdose	Improved
F	123	8	Depression in a borderline patient	Post-thyroid-ectomy; left hemiplegia; grand mal seizures; aortic valve replacement		Surgery as noted	No apparent benefit
F	33	5	Depression	Glaucoma	Could not tolerate tricyclics	Glaucoma medications	Improved
M	66	3	Depression	Prostatectomy with urinary incontinence	Elavil of no help for depression	Elavil produced urinary retention	Improved
M	37	6	Depression	Ca prostate; Paget's; ASHD with pvc's	Tricyclic Dexedrine Thorazine		Improved
F	85	3	Depression with paranoid features	CVA; diabetes; hip fracture; macular degeneration	Thorazine Valium Haldol Tofranil		Improved
F	56	8	Depression	Parkinsonism; mastectomy		Could not tolerate meds for Parkinsonism	Improved
F	29	6	Depression	Ca of colon; ASHD with angina		Had had resection of colon	Improved

79	M	82	14	Depression	Prostatic Ca Parkinsonism ASHD with angina; 3 yrs post MI	Mellaril	Stillbesterol for prostatic carcinoma	Improved
71	M	67	10	Depression	ASHD with pvc's; had 2 MI's	Elavil & lithium altered ECG		Had hypomanic reaction
82	F	56	9	Depression	Mastectomy			Improved
36	F	27	12	Acute schizophrenia	Mastectomy with generalized carcinoma	Thorazine Compazine Elavil	Psychosis began after chemotherapy and steroids for carcinoma	Improved
79	F	29	6	Depression	Ca of colon; ASHD with angina		Had had resection of colon	Improved
79	M	82	14	Depression	Prostatic Ca Parkinsonism ASHD with angina; 3 yrs. post MI	Mellaril	Stillbesterol for prostatic carcinoma	Improved
50	F	21	3	Depression and pain syndrome	Mastectomy with generalized carcinoma	Elavil	Lung resection for metastasis and radiotherapy	Improved
53	F	20	8	Depression Paranoia	Aortic stenosis (RHD)			Improved
75	F	22	4	Depression	Hyperparathyroidism; dehydration; glaucoma; diabetes; hypercalcemia	Stelazine	Rehydration with i.v. fluids	Improved

65	F	88	5	Depression	R mastectomy Ca L breast; R acoustic neuroma, op; shunt for recurrent hydrocephalus; L convexity meningioma	Elavil and Mellaril produced con-fusion	L radical mastec-tomy; Dilantin	Mild improvement
55	F	20	8	Depression	Aortic stenosis (RHD)			Improved
66	F	42	9	Depression Paranoia	Seizure disorder; emaciation	Haldol	Dilantin Had spontaneous seizure after ECT # 2	Improved
62	F	27	3	Depression	Biliary cirrhosis			Improved
53	M	27	5	Depression	One year post MI with residual dam-age; urinary retention			Improved
64	F	40	8	Depression Paranoia	Paget's disease of bone			Improved

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