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ELECTROCONVULSIVE THERAPY EXPERIENCES AT NARA MEDICAL UNIVERSITY HOSPITAL

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Abstract: We surveyed the clinical electroconvulsive therapy (ECT) treatment experiences between 1987 and 1992 at Nara Medical University Hospital. ECT is restrictedly applied to severely ill patients who have no response to other somatic therapies. For 5 years, 43 cases were treated with ECT, of which 27 suffered from depressive disorders, 3 from schizophrenia, 3 from somatoform disorders, and 10 from anxiety disorders. ECT was selected by psychiatrists for severe depressive states after failure of psychopharmacological therapy. A favorable therapeutic response to ECT was observed in 69% of patients with major depression, in 2 of 3 patients with schizophrenia, and in 70% of patients with anxiety disorders. In 2 of 3 patients with somatoform disorders, amelioration of the depressive or anxiety syndrome was not observed. Side effects of ECT were reversible memory disturbance (16%), retrograde partial amnesia (12%), and reversible confusional state (5%). These results suggest that ECT is highly effective in therapy resistant major depression, schizophrenia, and anxiety disorders. Therefore ECT still remains a necessary part of psychiatric therapy.

Index Terms

electroconvulsive therapy, depressive disorder

Elecroconvulsive therapy (ECT) is a result of von Meduna's original investigations of camphor-induced convulsion in schizophrenic patients[1]. Following that study, Cerletti and Bini in Italy (1938)[2], and independently Yasugouti and Mukasa in Japan (1939) developed ECT[3]. It was used primarily in schizophrenia, later also in depression and mania, and together with insulin coma therapy it was dominant in the 1940s. Its widespread use in psychiatry was reduced with the introduction in early the 1950s of neuroleptics and from early the 1960s with the introduction of effective anti-depressant drugs.

In spite of the availability of many powerful drugs, ECT remains a principle treatment of the severely mentally ill, although there has been a drastic decline in its usage in Japan[4]. ECT to many has been linked to something old-fashioned, brutal and brain-damaging, created by a negative psychiatric attitude.

Also, it is often emphasized that we do not understand its mode of action. However, we are no worse off with regard to ECT than in our lack of understanding of the modes of action of psychoactive drugs, psychotherapy, behavior modification, or psychoanalysis.

Disappointment with the efficacy of psychotropic drugs and the need to find treatment for

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therapy-resistant patients renewed interest in ECT.

At Nara Medical University Hospital, ECT is not the first choice, but remains as a valuable treatment option for selected patients who fail to improve with psychopharmacotherapy. In this report we present a retrospective study in regard to the use of ECT in Nara Medical University Hospital.

METHODS

The study was conduced in Nara Medical University Hospital. The hospital charts of all out- and in-patients between April, 1987 and March, 1992 were reviewed retrospectively for ECT treatment. Further details were elicited from the hospital charts with regard to patient age, sex, onset age and duration of psychiatic disorders, period of the psychiatric treatment and number of admissions before ECT, and psychiatric diagnosis based on DSM-III-R classification. Also, numbers of ECT treatments per course, induced seizures, and concurrent psychopharmacological medications were investigated. Efficacy of each ECT treatment and side effects were evaluated.

At this hospital, ECT was restrictedly indicated for severe depressive state of several functional disorders after failure of psychopharmacological therapy. ECT was ordinarily selected by psychiatrists, but sometimes patients who had previously experienced ECT demanded the treatment voluntarily. Prior to ECT treatment, all patients and families signed informed consent with explanation of the details of the treatment technique and the anesthesia technique as well as anticipated benefits and risks.

The instrument used is an electric convulsive device C-2 type made by SAKAI MEDICAL COMPANY, which delivers a sine-wave current. The characteristics of the stimulus were: current (constant), 1 amps; pulse frequency, 60/sec; stimulus duration, 5.0 sec; voltage 100. The technique consists of the skin being rubbed clean with alcohol swabs and dried, and the application of stainless-steel disc electrodes which are covered with conductive viscous gel bifrontotemporally (bilateral ECT). The modified form of ECT involves the administration of i. v. amobarbital Na, maximum 500 mg, to ease the fear of the patients, with the additional use of i. m. diprophylline (300 mg), i. m. dimorpholamine (30 mg) and oxygen delivered to the patient through a mask.

RESULTS

Table 1 shows that the utilization rate of ECT represented only 0.2% of all out- and in-patients in psychiatric service, Nara Medical University Hospital. Forty-three ECT cases were administered during April 1987 and March 1992, of whom 25 were women and 18 men. The

Table 1. Total number of the cases with ECT between 1987 and 1992

ECT between '87~'92	43 cases		
Mean age	44.6+14.9 y. o. (19~66 y. o.)	inpatient	32
		outpatients	11
Utilization rate of ECT	0.2%	men	18
		women	25

mean age was 44.6+14.9 years (19~66 years old) at the time of ECT treatment administration, and ECT treatment was more predominant among inpatients than outpatients. These 43 courses were given to 37 individual patients, who did not have organic brain disease, were free of serious medical illness, had not abused drugs or alcohol in the past year and had not received ECT in the past. The mean number of treatments per course was 8.7 (range ; 2~14). Of those, 32 (16 women and 16 men) had one course, four (3 women, 1 man) had two courses, and one woman had three courses. Bilateral ECT was exclusively used at a rate of three times per week. Bilateral electrode placement was selected in order to provide maximal potential benefits to the refractory psychiatric disorders group. The course of treatments lasted from 1 to 5 weeks. The demographic characteristics of the patients receiving ECT is presented in Table 2. Anxiety disorders group cosisted of 6 obsessive compulsive disorders and 2 generalized anxiety disorders. Depressive disorders group and somatoform disorders group cosisted of 22 major depression, and 1 dysthymia, 2 somatoform pain disorders and 1 hypochondriasis, respectively. The psychotropic medication therapy before ECT treatment was continued

Table 2. Diagnosis of the cases with ECT on DSM III-R criteria

Diagnosis	Depressive disorders	Schizophrenia	Anxiety disorders	Somatoform disorders
No. of subjects	23	3	8	3
Men	9	3	5	0
Women	14	0	3	3
Age [years]	47.9 (19~65)	27.7 (25~30)	34 (23~59)	53 (31~66)
Duratin of psychiatric disorders [years]	6.3 (0.5~32)	3.3 (2 ~ 5)	5.8 0.5~17)	12 (5 ~18)
Period of psychiatric disorders before ECT [months]	37.1 (1 ~136)	29.7 (14~39)	31.5 (0.5~108)	17 (8 ~26)
No. of admissions before ECT	0.83	0.66	0.38	0.3

Table 3. Psychotropic medication of the casen before ECT

Diagnosis	Depressive disorders	Schizophrenia	Anxiety disorders	Somatoform disorders
Perion of treatment [months]	before ECT 37.1 (1 ~136)	29.7 (14~39)	31.5 (0.5~108)	17 (8 ~26)
Tricyclic antidepressants	9 /27	1 / 3	2 /10	1 / 3
Tetracyclic antidepressants	12/27	—	1 /10	—
Neuroleptics	11/27	3 / 3	7 /10	—
Sulpiride	18/27	2 / 3	9 /10	2 / 3
Lithium carbonate	3 /27	—	—	—
Carbamazepine	5 /27	—	—	—
Trazodone	2 /27	—	—	—
Benzodiazepine	12/27	1 / 3	7 /10	2 / 3

Table 4. The results of ECT treatment

Diagnosis	Depressive disorders	Schizophrenia	Anxiety disorders	Somatoform disorders
No. of ECT	8.1 (2～14)	7.3 (3～10)	8.8 (3～11)	7.7 (5～10)
No. of eizure	8.1 (2～14)	4 (0～9)	8.8 (3～11)	7.7 (5～10)
No change	9 (33%)	1 (33%)	3 (30%)	2 (67%)
Partial remission	10 (37%)	2 (67%)	5 (50%)	1 (33%)
Full remisson	8 (30%)	0 (0%)	2 (20%)	0 (0%)

Table 5. The side effects of ECT treatment

Side effect	14 (33%)
Reversible memory disturbance	7 (16%)
Retrograde partial amnesia	5 (5%)
Reversible confusional	2 (5%)
Headache	1 (2%)
Insomnia	1 (2%)
Nausea	1 (2%)

during ECT treatment, which is summarized in Table 3.

The number of ECT treatments per course and the induced seizures, and the effects of ECT therapy are presented in Table 4. The number of ECT treatments per course for schizophrenia was not as many as the number of induced seizures, because one of three schizophrenic patients had no induced seizures at all. The patients of endogenous depression, delusional schizophrenia, and anxiety disorders showed approximately 70% effective response rate. Out of three cases of somatoform disorders, two patients of somatoform pain disorder showed no rsponse to ECT and one patient of hypochondriasis showed partial remission.

The side effects of ECT are summarized in Table 5. Out of the 14 patients with side effects, 7 had reversible memory disturbance, 5 had retrograde partial amnesia, 2 had reversible confusion state, and 3 had autonomic symptoms including headache, insomnia, and nausea.

DISCUSSION

Reference to ECT was made following failure of, or intolerance to a trial of psychotropic agents, with primary use of ECT reserved for situations in which a rapid response was necessary, the risks of treatment alternatives were unacceptably high, or treatment history dictated it. A favorable therapeutic response to ECT was observed in 69% of patients with major depression, in 2 of 3 patients with schizophrenia, and in 7 of 10 patients with anxiety disorders. Fink M.[5] reported an effective response rate in major depression ranging between 60% and 90%, which corresponded to this result. ECT can justifiably be considered superior to antidepressant therapy as generally described.

Cognitive impairments after a series of ECT have been well characterized[6]. After ECT, many patients have anterograde and retrograde memory deficits that typically resolve within a few months after treatment. Permanent effects appear to be restricted to gaps in memory for events that happened during the period surrounding the ECT course. Degree of memory

deficit was related to age, electode placement, and frequency and number of seizures on ECT[5].

In this study all the side effects observed in 14 patients disappeared within 4 weeks. They did not show long-term adverse effects. This might be because 32 of 37 patients received their first ECT courses, on average 8.7 treatments. In future we may reduce more memory deficits by delivering each minimum electric brief-pulse square-wave current with unilateral ECT.

The absence of any serious cardiovascular or neurologic events in this report attests to the safety of ECT. We find ECT is safe and highly effective for therapy resistant depressive disorders, schizophrenia, and anxiety disorders, but not quite as strongly effective for somatoform disorders.

It is evident that ECT today still has an important place in the treatment in psychiatry. Also it is clear that the role of ECT will be gradually reduced with the introduction of better and safer anti-depressants or anti-psychotic drugs. However, the more rapid onset of symptom reduction documented for ECT as compared with drugs would make this treatment modality an important weapon in the hands of psychiatrists fighting symptoms of depression, especially delusional depression, and not least in patients at high risk for suicide[7].

As ECT will probably remain for some time an important part of our treatment armamentarium, further research is important concerning both clinical and basic issues with regard to this therapy, and also we should make stronger efforts to more openly present knowledge of the relative importance of ECT on the whole to psychiatry.

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