

Practice of electroconvulsive therapy at University Hospital, The University of Tokushima School of Medicine from 1975 to 1997

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Abstract : *Background* : In Western nations the effect of ECT has been re-evaluated since the 1970s, while reports on ECT are few in Japan.

***Methods* :** The sample included 3,067 patients admitted to Tokushima University Hospital between 1975 and 1997. Hospital charts were reviewed retrospectively for ECT .

***Results* :** ECT was carried out on 6.03% of all subjects ; 11.97% of patients with schizophrenia, 4.88% with manic depressive psychosis, 7.44% with atypical psychosis and 3.27% with psychogenic reactions. The remission rate from ECT was 68.11% of all subjects ; 59.85% with schizophrenia, 100% with manic depressive psychosis, 100% with atypical psychosis and 92.0% with psychogenic reactions. Patients averaged 10.26 treatments. ECT had been administered mainly to patients who had responded poorly to pharmacotherapy and to patients who required rapid improvement of life-threatening symptoms. ECT was highly effective for symptoms as excitement, suicidal tendencies and stupor. Side effects were claimed by 36.77% of patients.

***Conclusions* :** ECT is suggested to be a useful therapeutic modality in current psychiatric practice. *J. Med. Invest.* 47 : 123-127, 2000

***Key words* :** ECT, treatment, method of administration, retrospective study

INTRODUCTION

It was believed that a certain biological antagonism existed between the convulsive state and the schizophrenic process in the early 20th century. This idea led Meduna to induce convulsions in schizophrenic patients by the intramuscular injection of oil of camphor in 1934. Following that study, Cerletti and Bini described a method of producing convulsions with electric current (Electroconvulsive therapy-ECT) in 1938. This was used primarily to treat schizophrenia, and later also for depression and mania. The procedure was widely used in the 1940s,

but with the introduction of neuroleptics and antidepressants in the 1950s, widespread use of ECT declined.

Limitations in the efficacy of psychotropic drugs and the need to find treatment for therapy-resistant patients led to renew interest in ECT. In Western nations the effect of ECT has been re-evaluated since the 1970s, use of ECT leveled off in the 1980s and has since been rising (1). In Japan, however, the use of ECT as well as reports on ECT have been declining for more than 30 years (2). Nakajima reported that 58.6% of psychiatrists in Japan had never used ECT (3). This report presents a retrospective study on the use of ECT at the Tokushima University Hospital.

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MATERIAL AND METHODS

The subjects included all inpatients admitted to the neuropsychiatric ward at Tokushima University

Hospital for the calendar years 1975 through 1997. Hospital charts were reviewed retrospectively for ECT. Examined were the diagnoses of patients who received ECT, the effects of ECT by diagnosis, the number of electrical stimuli given to each patient, the target symptoms and efficacy of the treatments, and the side effects. The diagnoses were made according to the traditional diagnostic system based on German psychiatry.

ECT was administered mainly to patients who had responded poorly to pharmacotherapy and to patients who required rapid improvement of life-threatening symptoms. Some patients who had previously experienced ECT requested the treatment voluntarily. Prior to ECT, all families signed informed consent with an explanation of the details of treatment and anesthesia, as well as the anticipated benefits and risks.

Treatments were commonly given at about ten o'clock in the morning, usually three times a week. Patients had nothing to eat or drink in the morning before each treatment. Trans- π -oxocamphor and dimorpholamine were administered by intramuscular injection. The electrode sites were carefully cleaned with alcohol swabs and then dried. The patients were given a short-acting barbiturate (thiamylal sodium) intravenously to induce light sleep. When the patients were asleep, assistants restrained their shoulders, arms and thighs to prevent extreme motion. A padded tongue depressor or other resilient mouth gag was placed between the teeth to prevent biting the tongue or other injury, and then a sine-wave electrical stimulus was given. Pulse and blood pressure were checked before and after the procedure. All patients received bilateral ECT with electrodes placed in the bifrontotemporal position. The ECT apparatus was a C-1 type electric convulsive device made by Sakai Medical Company.

RESULTS

1. Patients receiving ECT and the effects of ECT by diagnosis.

Table 1 presents data for all inpatients, the number of patients who received ECT, and its effect. We investigated 3,067 patients of which 185 (6.03%, 90 men and 95 women) received ECT during their admission. The mean age was 27.53 ± 8.8 years old (range 13 ~ 59) at the time of ECT administration. ECT was carried out most often on patients with a diagnosis of schizophrenia and next on those with atypical psychosis. As for efficacy, all patients who were diagnosed with manic depressive psychosis or atypical psychosis had remission. Patients with psychogenic reactions showed an over 90% remission rate. The remission rate for patients with schizophrenia was approximately 60%. Remission was defined as the state in which patients can lead a somewhat social life.

2. Number of treatments given to each patient.

Total number of electrical stimuli given to each patient during admission are presented in figure 1. Patients averaged 10.26 times with a range of one to 43. The most common number of treatments was ten ; (approximately 30% of patients). Five to nine treatments was also relatively common. Nine patients received over 20 treatments.

3. Target symptoms and efficacy

Target symptoms for ECT included delusions, excitement, hallucinations, stupor, anxiety, irritability and suicidal tendencies in order of decreasing frequency. The remission rate for excitement, suicidal tendencies and stupor was high, while that for delusions and hallucinations was relatively low.

Table 1. Patients Receiving ECT and Remission Rate by Diagnosis

Diagnosis	Total Admissions	Receiving ECT		Remission on ECT	
		N	%	N	%
Schizophrenia	1,103	132	11.97	79	59.85
Manic Depressive Psychosis	246	12	4.88	12	100.00
Atypical Psychosis	121	9	7.44	9	100.00
Psychogenic Reaction	764	25	3.27	23	92.00
Other	833	7	0.84	3	42.86
Total	3,067	185	6.03	126	68.11

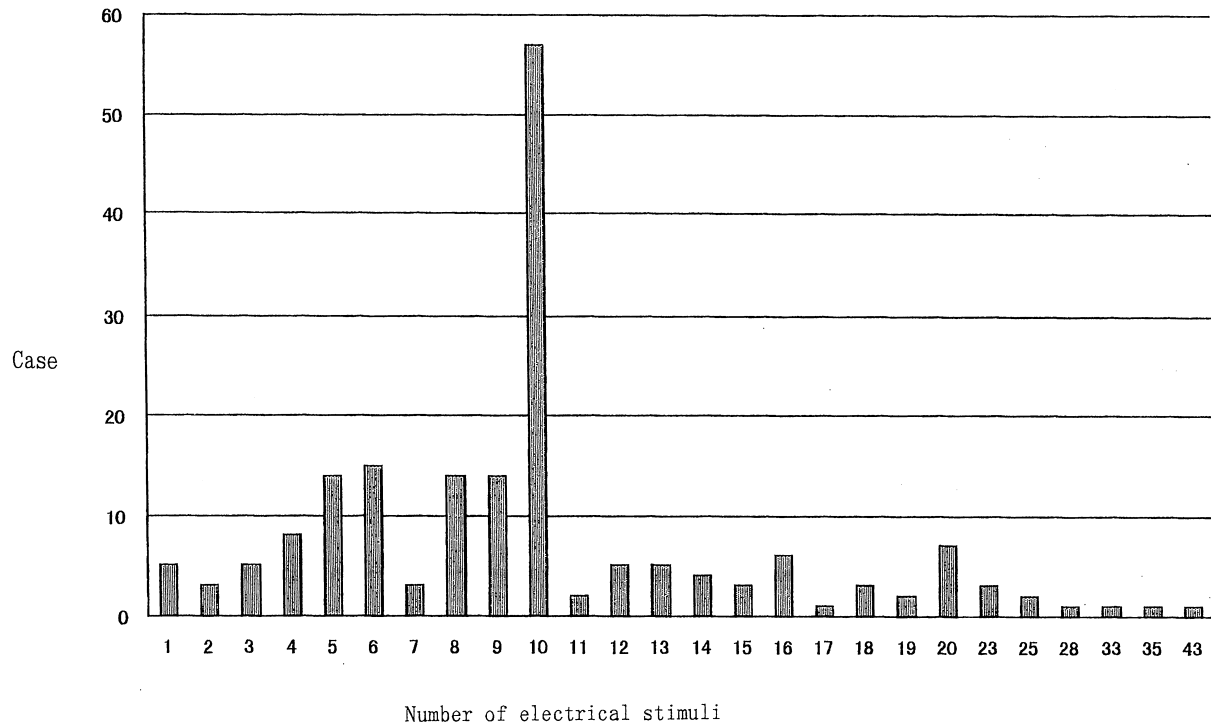


Fig. 1. The total number of treatments given for each patient

Table 2. Target Symptoms and Remission Rate

Target Symptoms	Case	Remission	
		N	%
Delusion	55	34	61.18
Excitement	42	34	80.95
Hallucination	33	18	54.55
Stupor	29	22	75.86
Anxiety, Irritability	17	9	52.94
Suicidal Tendency	16	14	87.50
Drug refusal, Negativism	9	5	55.56
Dissociative Symptoms	9	6	66.67
Impulsive Act	5	2	40.00
Other	13	5	38.46

There is overlap in the symptoms

Table 3. Side Effects

Side Effects	N	%
Side Effects	68	36.77
Amnesia	29	15.68
Pyrexia	19	10.27
Psychotic Symptoms*	14	7.57
Headache	12	6.49
Lumbago	6	3.24
Dizziness	2	1.08
Hypotension	1	0.54
Nausea	1	0.54
Compression Fracture	1	0.54

*Twilight State, Disinhibition etc.
There is overlap in the symptoms

4. Side effects

The side effects for ECT are summarized in table 3. The most commonly reported side effect was amnesia followed by pyrexia. All side effects were transient and gradually resolved over several weeks after treatment except for one case of compression fracture of vertebrae.

DISCUSSION

ECT was carried out on 6.03% of all inpatients in our hospital. This percentage is comparable with those from other hospitals ; 3.6% in Kyushu University Hospital (4), 5.5% in Jichi Medical School Hospital (5) and 5.7% in Imabari Hospital (6). It shows that ECT is an uncommon treatment in Japan. ECT was effective for 76.3% of patients in Kyushu University Hospital (4), 87.5% in Jichi Medical School

Hospital (5) and 80.3% in Imabari Hospital (6). In our hospital, the remission rate was 68.11%, which was lower than in other three hospitals. Remission was defined as the state in which patients can lead a somewhat social life.

Most patients receiving ECT in Western nations are diagnosed as having affective disorders (7), while in our hospital ECT was given most often for schizophrenia. Other investigations in Japan showed the same findings (4-6). ECT was more effective for manic depressive psychosis, atypical psychosis (4,6) and psychogenic reactions (4) than for schizophrenia. But even for schizophrenia, the remission rate was approximately 60%.

The mean number of electrical stimuli given to each patient was 10.26. This is almost the same as in Western nations : six to twelve times (8-10). However, the method of administration was different from that in Western nations. In our hospital ECT without muscle relaxation was administered, while in Western nations ECT with muscle relaxation (modified ECT) is common. In Japan 41.4% of psychiatrists performed ECT and 84.4% of them performed ECT without muscle relaxation (3). The mean age of patients who received ECT was 27.53 years old. This indicates that they were physically strong without health complications, which is related to the choice of ECT without muscle relaxation.

ECT was highly effective for symptoms that required rapid improvement such as excitement, suicidal tendencies and stupor. ECT's fast onset of effect relative to medication therapy was its main benefits.

As for the side effects, all were transient and gradually resolved over several weeks after treatment except for one. There was one case of compression fracture of vertebrae, which might have been prevented if modified ECT with muscle relaxation had been performed. We must consider using modified ECT in the future.

ECT is suggested to be a useful therapeutic modality in current psychiatric practice, but the issue of method remains. In Japan, ECT was first performed at Kyushu University Hospital in 1939 (11). The procedure was widely used in the 1940s, but the widespread use of ECT declined in the 1950s. For example, over 90% of schizophrenic inpatients at Kyushu University Hospital received ECT in 1950, but the use of ECT had decreased by half ten years later (12). Reports on ECT decreased from around 1960. The main reason was the introduction of psychopharmacotherapy in the 1950s. However, in a questionnaire survey of the reasons for decreased

use of ECT, Nishio reported that many psychiatrists answered with a negative emotional attitude like "ECT is not a suitable procedure for a human being". Many complaints against psychiatric medicine were made at that time. ECT was one of the targets, and was portrayed as a terror, torture and punishment for difficult patients (2). Also, it was often emphasized that we did not understand its mode of action. Hence the procedure fell into disfavor. ECT had been linked to something old-fashioned, brutal and brain-damaging. Nevertheless, some psychiatrists who were aware of its utility for severe and refractory patients continued to use ECT, but discussions on it had been avoided for a long time in Japan. Thus the procedure of ECT had not been improved : only atropine or similar agents and intravenous anesthesia were added to the classic procedure by Cerletti. We use traditional ECT machines that deliver a sine-wave stimulus : modern ECT machines that deliver brief-pulse electrical stimulations are not available in Japan.

Recently, re-evaluation of ECT in Western nations (7,9,10) led to the introduction of modified ECT, and initiation of new investigations of ECT, in Japan. Much collaboration is needed to establish clear guidelines for ECT application, and it is necessary to cooperate with other specialists such as internal physicians and anesthesiologists in order to conduct ECT more successfully. These collaborations and cooperation will allow ECT to regain its place as a useful therapeutic modality in psychiatric practice in Japan.

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