Chapter 3

Materials and Methods

The comparison study of electroconvulsive therapy combined with atypical neuroleptic versus atypical neuroleptic in schizophrenic patients was designed to be a randomized clinical trial; with the following methods :

Population and Sample

Target Population : Schizophrenic patients treated in mental hospital.

Sample Population : Schizophrenic patients treated in psychiatric department at King Chulalongkorn Memorial Hospital.

Sample Group : Patients qualified for inclusion and exclusion criteria.

Inclusion Criteria

1. Patients in psychiatric department at King Chulalongkorn Memorial Hospital, who have been diagnosed as schizophrenia by a psychiatrist using Diagnostic and Statistic-Manual of Mental Disorder, Fourth edition (DSM-IV) as diagnosis criteria.
2. Patients are at the age of 15-45 years old.
3. Patients had signed consents form.
4. Patients did not received any treatment for 1 week before given intervention.

Exclusion Criteria

1. Patients have contraindication for ECT.
2. Patients have contraindication for olanzapine.
3. Patients have contraindication for general anesthesia.
4. Patients scored less than 30 on Brief Psychiatric Scale (BPRS).
5. Patients are unable to communicate with full conscious.

Sample Size

The sample size calculation of 2 independent sample[60] are as followed :

$$n/group = \frac{2[(Z\alpha + Z\beta)\sigma]^2}{(Mc - Mt)^2}$$

$$= \frac{2\,(Z\alpha + Z\beta)^2\sigma^2}{(Mc - Mt)^2}$$

n = sample size

$Z\alpha$ = type I error = 5%, critical values of Z for one-tailed test = 1.64

$Z\beta$ = type II error is 10% = 1.28

σ^2 = pooled Variance $= \frac{(n_1 - 1)\,S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}$

Mc = mean of control group

Mt = mean of experimental group

The pooled variance need to be calculated by using data of 6 patients from previous studies that have the same intervention and measuring instrument as this study.

n	ECT & Neuroleptic[61] (differences of scores before & after intervention)	n	Neuroleptic alone[62] (differences of scores before & after intervention)
1	19	4	19
2	22	5	17
3	23	6	18
Mean $(\bar{x})$	21.3		18
Standard Deviations (SD)	2.08		1

$$\sigma^2 = \frac{(n_1-1)\,S_1^2 + (n_2-1)\,S_2^2}{n_1 + n_2 - 2}$$

if $n_1 = n_2$ $\therefore$ $\sigma^2 = \frac{S_1^2 + S_2^2}{2}$

$$\sigma^2 = \frac{(2.08)^2 + (1)^2}{2} = 2.66$$

$$n = \frac{2(1.64+1.28)^2\,(2.66)^2}{(18 - 21.3)^2} = \frac{120.66}{10.89}$$

$$n = 11.08$$

Since this study is a clinical trial and to make it more efficient, the number of patients brought into the study need to be equal to the above calculated sample size (n). The researcher decided to study with the exact calculated sample size to have more chance of statistic significant. The sample size will be 11 patients for each group, which mean, 22 schizophrenic patients participated in this study.

Sampling Techniques

The method of block randomization was used, in order to distribute samples into study group and control group to reduce bias.

" A " = combination treatments of ECT and atypical neuroleptic (study group)

" B " = single treatment of atypical neuroleptics alone (controlled group)

Twenty-two schizophrenic patients treated in King Chulalongkorn Memorial Hospital who have been interviewed by the researcher and qualified for inclusion and exclusion criteria. The patients, were then, distributed into either combination treatments of ECT and atypical neuroleptic or atypical neuroleptic alone by using block randomization

Observation & Measurement

In order to include the most homogenous group of sample, an inclusion form was needed for collecting general information of each patients.

In order to evaluated the quality of treatments, that treatments must be safe and effective for the patients.

Measurement of effectiveness :

Brief Psychiatric Rating Scale[23] was being used in many studies world wide, including Thailand.[61,64] It was used to assess psychopathology of the patients. It included both negative and positive symptom in 18 items that need to be observed and interviewed with the patients. In which, researcher have been trained to rate by professional rater. The 10 schizophrenic patients was used for testing reliability. Using SPSS version 7.5 for window, its reliability was tested by alpha coefficient which was 0.8726.

Quality of Life Index[24] was used to assess patient's well being which can be a measurement of patient's psychosocial aspects. It includes 5 items involving activity, daily living, health, support, and general outlook of the patients. It had been tested for face validity by content experts. And its reliability was calculated by SPSS version 7.5 for window, using 10 schizophrenic patients and the result of alpha coefficient was 0.6075.

Measurement of side effect :

The UKU Side Effects Rating Scale[25] was used to monitor side effects of the patients. The scale includes 9 items on psychic side effects, 9 items on neurologic side effects, 11 items on autonomic side effects, and 18 items on other side effects. The UKU Side Effect Rating Scale had been tested for face validity by content experts. The reliability was tested by using 10 schizophrenic patients with the calculation of program SPSS for window, the alpha coefficient was 0.8667.

Intervention

A complete data collection of BPRS, UKU, and QL-Index was done to every patients, who have signed research consent form and passed the inclusion criteria and exclusion criteria. Researcher then separate the patient into controlled and experimental groups, by using block randomization. Electroconvulsive therapy and atypical neuroleptics was given to experimental group. Atypical neuroleptics was given to control group. During the 6 weeks intervention, BPRS, and UKU side effects rating scale was used for each patient to observe changes which took approximately 30 minutes for each patient. As for QL-Index, it was being assessed once again at the last week (6th week) of the observation.

Treatment Procedure

Atypical neuroleptic : Patients were to take olanzapine orally, at night (before go to sleep) at does range 10-20 mg per day.

Electroconvulsive therapy :

Pre-treatment - signed consent form
- no food or drink (NPO) at least 6 hours before treatment
- dental checked up
- empty bladder before treatment
- support patient to reduce anxiety

Medications preparation - Atropine sulfate = 0.4mg.
(for emergency)
- Calcium chloride 10% solution = 10ml.
- Dexamethasone = 4mg., 24mg.
- Dextrose 5% in water = 250ml.
- Diazepam 5 mg./ml. = 2 and 10 ml.
- Epinephrine - 1:10,000 solution =10ml.
- Lidocaine (xylocaine) - 2% solution = 5ml. = 100mg.
- Metaraminol (aramine) - 1% solution = 10ml.
- Methylprednisolone = 125 and 1,000mg./vial
- Sodium bicarbonate - 7.5% solution = 44.6 mEq. = 50ml
- L-Norepinephrine (levophed) = 2mg./ml. - 4mg./ampule

Equipments preparation - suction utilities
- syringes and needles
- EKG
- defibrillator
- laryngoscope
- endotracheal tube

- oxygen
- ambu bag
- mask
- ECT equipment (MECTA SR-1)

Procedures :

1. Patient lied down in supine position on treatment bed to placed electrodes bilaterally and installed with the ECT equipment that had been set for duration frequency, and pulse width for each individual patient.
2. Thiopental was administered intravenously by scalp vein (24G). At first, 50mg. of thiopental was administered to test for hypersensitivity. After that, the drug was administered until the patient felt to sleep. (approximately 200-300 mg.) An eyelash reflex was checked to confirm patient's sleepiness.
3. To support the respiratory system of the patient, anesthetic mask and ambu bag was used to give 100% oxygen throughout the process of ECT.
4. Succinylcholine (muscle relaxant) was administered intravenously after thiopental. The dose range of succinylcholine was about 20-30 mg. (0.5 -1.5 mg./kg.).
5. To confirm muscle paralysis, signs of fasciculation was checked and Babinski's sign must be diminished including decrement of heart rate.
6. After the patient was truly unconscious and relaxed, the ECT machine was occupied by sending brief electric currents to the patient.
7. A close observation of patient's seizure are recommended. During tonic phase, a plantar flexion occurred, for about 10 seconds after, the movement of patient's toes marked the clonic phase of the seizure. If the following phases of seizure did not

occurred, a second stimulation need to be done to gain therapeutic effect.

8. After the seizure, oxygen supplement still occupied until patient can master his or her respiration.
9. Suction needs to be used in case of increase secretion in the respiratory tract.
10. Check for trauma in oral cavity, which might occur from the seizure.
11. Checked vital signd periodically until the patient is fully conscious.
12. Lateral position is recommended for patient after the seizure.
13. Side rails must be pulled up to prevent patient from falling
14. Patient needs to rest in treatment bed until he or she can securely get up and go home.

Additional treatment may be needed to reduce severe side effect of atypical neuroleptic and/or electroconvulsive therapy.

Data Collection

The first data collection was collected before any intervention was given. Researcher collected personal data, BPRS, UKU, and QL-Index of each patient from their chart and personal interview with the patients and their relatives. Later, the assessment would be done once a week except for the QL-Index which would be assessed only before and after the six weeks interventions. In case of patient's inconvenience to visit the hospital weekly, researcher would go to their house once a week for the assessment.

Data Analysis

The program SPSS version 7.5 for window was used for data analysis with the following statistic :

summerization of data – to manifest the general characteristic of data

1. percentage
2. mean
3. standard deviation

hypothesis testing – to test the hypothesis of this study

1. paired t-test : test for difference between 2-dependent groups
2. unpaired t-test : test for difference between 2-indepentdent groups