

# The Application of Electroconvulsive Therapy in Chinese Population

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## ABSTRACT

The purpose of this article is to study the use of ECT in the treatment of bipolar II in China. This paper extracts relevant data through the study of some academic literature. Finally, it is concluded that ECT is widely used in China, especially for teenagers. Although ECT can inhibit suicide in the treatment of some mental diseases, this effect is not significant in the treatment of bipolar disorder. According to the data, even if people are willing to receive ECT treatment, most patients and their families do not understand the principle and knowledge. We should conduct in-depth study on the side effects of ECT treatment.

**Keywords:** *Bipolar II disorder, ECT therapy, psychology, China*

## 1. INTRODUCTION

Bipolar disorder is a mental disorder that causes changes in a person's mood, energy, and ability to function. People with bipolar disorder experience intense emotional states that typically range from very elated episodes to extremely down episodes. They can last from days to weeks and are called mood episodes[1]. Bipolar disorder has three types: Bipolar I, Bipolar II, and Cyclothymic Disorder.

Bipolar II disorder is one type of bipolar disorder characterized by at least one major depressive episode or at least one hypomanic episode. Distinct from Bipolar I disorder, Bipolar II disorder does not have a manic episode. From the research carried by Suominen K, et al [2], it suggested that gender does not affect illness related clinical characteristics. However, their profile of comorbid disorders may have some differences. For example, Women seem to have a higher risk of recurrence than men in terms of substance use and eating disorders. In terms of age, there were 4.3%, children aged 17-18 suffering from bipolar II, which means this disease has a great impact on adolescents and it should be paid attention to by the society.

Electroconvulsive therapy (ECT) is one of the traditional therapeutic modalities in psychiatric clinical

practice, which was first proposed by the Hungarian neuropsychiatrist Ladislas Meduna in 1934 [3]. ECT is a procedure, done under general anesthesia, in which small electric currents are passed through the brain, intentionally triggering a brief seizure. (Mayo Clinic). It is a medical treatment most used in patients who had severe psychiatric disorders such as schizophrenia, bipolar disorders [4]. ECT involves a brief electrical stimulation of the brain while the patient is under anesthesia. It is expected to inhibit the depressive or manic mood the patients have.

It is estimated that the rate of having bipolar disorder in China was less than Western World, due to the stereotypes about mental illnesses many people might not be diagnosed in China [5]

However, considering the highly stressful environment and highly populated situation of Chinese society, the percentage of population who have bipolar disorder may be higher than estimated [6]. Bipolar II disorder, according to the estimation, has a 0.04% lifetime prevalence in China from the statistical analysis of the general population in China[7].

The frequency of using ECT therapy and its effectiveness had already been tested and reviewed in the U.S, [8] however it still needs more investigations in international areas to prove that it can be adapted to

different populations and cultures. China, as a country that has a potentially large population who suffer from bipolar disorder and schizophrenia, nevertheless is still lacking evidence of ECT on bipolar II.

Previous reviews had investigated the effectiveness of ECT therapy amongst American adults and adolescents, however, the previous reviews did not investigate the effectiveness amongst the Chinese population. Therefore, it is currently unknown to what extent the ECT therapy has been used in China, and whether it is effective.

Thus, to fill this gap, we gather the information retrieved from systematic research to investigate the implementations of ECT among patients of bipolar II in China. It is believed that such a review can facilitate further clinical practice during the decision-making stage.

## 2. METHOD

Studies fulfilled below criteria were included in the current systematic review

a) The main participants are Bipolar II patients in China.

b) The intervention that the research tests are Electroconvulsive therapy.

c) Ideally, the intervention study shall be randomized controlled trials. The control group which is used to compare with the experimental group is not limited, but usually are Bipolar II patients who didn't use ECT or used other therapies. The results of the research are the data and reports of the effectiveness of ECT. In consideration of the limited investigation, we anticipated in the Bipolar II in the Chinese population, we decided to cover all the research design if there were any relevant aspects to the treatment of Bipolar II in China. These designs are not limited to feasibility and acceptability design, single group pre-post design, case study, etc. Unpublished data in any form was eliminated, including dissertations and conference proceedings.

The databases we searched are PubMed, PsycINFO, and Medline. Other resources are from reference lists of relevant reviews and included articles in the current review. In case of missing research outside the time frame of the first search, the publications mentioning the included articles were further evaluated. The most recent search is up to September 2021.

The search strategy of the current review is to combine Mesh terms and text words indicative of bipolar II, Electroconvulsive therapy, and China.

Zotero was used to import the entries from the databases that were initially discovered and to remove duplicates. Two researchers independently completed title/abstract screening, full text screening, and data extraction of records (Kefan Shi, Zhuoxi Duan). With the

assistance of a senior reviewer, disagreements were settled.

To form qualitative research, our group uses data and research results from the articles we selected as evidence for our research. To be specific, the characteristics of the studies including the length, setting of the intervention, the demographic information of the patients, the overall outcome of the studies (positive or negative) and some certain aspects that can be distinct from other studies were pooled and summarized.

## 3. RESULTS

Out of twelve studies after duplication removed, only eight studies were included in the current review. These studies were based on the ECT in the clinical setting and their primary research goals covered the feasibility and acceptability of ECT in the Chinese population, the treatment effect on suicide risk, and some potentially risky aspects relevant to ECT in the clinical practice. We therefore summarize these studies in order to provide a rough picture of the application of ECT reported in the English publications.

### *3.1. The feasibility and acceptability of ECT in China*

Three retrospective studies were identified to study the status of usage of ECT in the Chinese population. They suggested that ECT is widely used in China in different groups of population including teenagers and older adults. Specifically, Ma [8] investigated the application status of ECT in different cultures and found out that Electroconvulsive therapy use appears to be substantially higher in China than in the United States. For the 869 participants who had bipolar II disorders, 32% of them received ECT therapy.

Based on sociodemographic and clinical data collected from the electronic chart management system for discharged patients, Zhang et al [9] conducted a study to examine the frequency of ECT, as well as the demographic and clinical correlates of adolescent psychiatric patients hospitalized in a tertiary psychiatric hospital in China. Their samples are the 954 young teenagers aged between 13 and 17 years treated over a period of 8 years (2007–2013). The result shows that the rate of ECT use was 57.8% for bipolar disorders, which indicates that among adolescent patients, the use rate of ECT is very high. Patients with other mental illnesses were less likely to obtain ECT than those with schizophrenia. The use of ECT was linked to older age, a greater risk of aggressiveness at the time of admission, and the use of antipsychotics and antidepressants.

Similarly, in another study by An [10] that consisted of 1364 inpatients consecutively recruited, the percentage of ECT use was 57.8% in bipolar disorder.

There was no significant difference between the ECT and non-ECT groups in any domain of QOL.

Another study we identified was also a retrospective chart review of 2339 inpatients aged 60 years and older treated over a period of 8 years (2007-2013) in a university-affiliated psychiatric institution in Beijing [11]. The rate of using ECT was found as 37.9% in those with bipolar disorders. ECT ("ECT group") was associated with 60-65-year age group, high risk for suicide and low risk for falls at the time of admission, use of mood stabilizers and antidepressants, lack of health insurance, and having major medical conditions and diagnosis of major depression. This study indicated that the use of ECT was common among older patients.

### **3.2. The effect of ECT on reducing suicide rates**

We identified one study that explored the effect of ECT on the suicidality in the context of Chinese culture. Liang et al [12] used data from a nationwide retrospective cohort study that investigates the effects of ECT on decreasing the thoughts and attempts to suicide comparing with psychopharmacotherapy. After gathering data from the Taiwan National Health Insurance Research Database, inpatients with unipolar illness or bipolar disorder who got ECT (n = 487) were monitored for suicide occurrences from January 1, 2000 to December 31, 2013. Inpatients receiving psychopharmacotherapy were randomly matched (ratio, 1:4) by age, sex, and illness in the non-ECT control cohort. They found that compared with psychotherapy, ECT has better anti suicidal effect on patients with unipolar mental disorder and bipolar depression: with potential confounds accounted for, the adjusted hazard ratio (HR) was 0.803, indicating that ECT recipients showed a 19.7% lower risk of suicide than control individuals. However, ETC lacks superior anti suicide effect in the treatment of patients with bipolar mania and of mixed state. Therefore, using of ECT can reduce the suicide rate, however it does not show the clear effect on the bipolar II disorder.

### **3.3. Potential risk of ECT**

Certain aspects regarding the risk of using ECT in the treatment were also found in some studies and results was found to some extent controversial. Some scholars believe that the use of ECT may cause Alzheimer's disease in patients, but according to Chu, Ching Wen et al [13], it has been found that ECT has nothing to do with the increased risk of dementia in patients with schizophrenia, bipolar disorder, and major depression. However, based on the research of Zong, Qian-Qian et al (2020), which aim is to examine the knowledge, experiences, and attitudes of teenagers with severe psychiatric disorders and their caregivers towards ECT in

China. The result shows that only about half of patients and caregivers said they got enough information about the procedure, the therapeutic and side effects, and the dangers of ECT, even though most people thought it was helpful and around half thought it was safe. Only critically ill patients should receive ECT, according to about a third of patients and careers. Memory loss, headaches, and short-term disorientation were all reported by more than half of the patients. It provided empirical evidence that ECT treatment has some side effects. People must have an attitude that before treatment, adolescents with serious mental diseases and their caregivers should be provided with sufficient information about ECT, with special attention to the treatment process and possible side effects.

### **3.4. Patients' and Relatives' Knowledge**

Two studies conducted surveys on the attitude held by patients and their relatives on the ECT itself and its potential influences on the patients. In Zong [14], In this study, 158 people were included, including 79 adolescents who had ECT and their careers (n = 79). Only about half of patients and caregivers said they had enough information about the procedure, the therapeutic and side effects, and the dangers of ECT, even though most people thought it was helpful and around half thought it was safe. Only seriously sick patients should undergo ECT, according to around a third of patients and caregivers. Memory loss, headaches, and short-term disorientation were all reported by more than half of the patients. In another study [15], in a prospective cross-sectional survey involving 96 patients and their 87 relatives, the majority of patients believed they had not received adequate information about ECT. Although most patients and family had minimal awareness about ECT, they were happy with the therapy and maintained a favorable attitude toward its usage since they felt it to be useful. In terms of attitude, the majority of patients and families were pleased towards ECT, with relatives being more satisfied than patients. It represents that more and more people are willing to accept and understand the use of ECT.

## **4. DISCUSSION**

The current study adopted the method of systematic review to scrutinize the ongoing studies regarding the application of ECT in the patients with Bipolar II disorder in the Chinese context. Very few of studies were identified in our search process and therefore only five studies were finally eligible to be included in the current review. This illustrates that the status of ECT being studied in bipolar II patients is still in great need of more research in China.

We also identified studies investigating the frequency and acceptability of ECT in China. It is estimated that

ECT was widely used and acceptable to the patients. These patients being surveyed in their study were mostly young people. Therefore, this acceptability could be primarily the attitude from the younger generation towards the ECT itself. Further research based on other generations and groups of other ages are still needed.

Furthermore, due to that fact that the high rate of ECT applied only to single setting which limits our extrapolation on the results to other populations. Besides, from the current review, the percentage of ECT use was found much higher in a psychiatric center in China than other countries. Further investigations are warranted to explore the reasons for the high percentage of ECT use.

We also summarized the studies questioning the basic knowledge of ECT among the patients and family members of the patients who received the ECT. Both patients and relatives were particularly hazy about technical aspects of ECT, such as the presence of seizure, its mechanism of action and safety, or the use of muscle relaxants, supporting the findings of Freeman and Kendell, who found that 59 percent and 58 percent of a group of patients and relatives, respectively, correctly answered 18 questions about ECT.

It was found that they most likely were not aware of this type of therapy and barely knew what the effect of the ECT nor the side effect or other consequences would be. This result should be a reminder to the clinical practice that clinicians should educate the patients and their family members especially the members who closely followed the clinical process together with the patients to let them be aware of the basics of the ECT and potential outcomes of the therapy. In this way, it is anticipated the rapport can be obtained well from the patients and their family. Future research can further examine this professional disclosure on the therapy information could improve the adherence and the clinical outcomes or not.

From our inclusion, the researchers concluded that in Hong Kong, the way to disclose information to the patients and their relatives needs to be improved when obtaining consent for ECT. Despite that, we still found satisfaction from the patients towards the ECT, which indicates its effectiveness. However, in the current study, we were not able to identify enough studies on the effectiveness of ECT on bipolar symptoms. Future research warrants more investigation.

Only one study found that compared with psychopharmacotherapy. From this study we found that ECT exerted superior anti-suicidal effects in patients with unipolar disorder and bipolar depression; however, there was a lack of superior anti-suicidal effects of ECT in the treatment of patients with bipolar mania and mixed state.

The inclusions investigated some of the ECT's worries. Using Taiwan's National Health Insurance

Research Database, one study sought to determine if ECT is linked to the risk of dementia following treatment (NHIRD). It confirmed that ECT was not linked to a higher incidence of dementia. Furthermore, another study found that ECT had no effect on short-term QOL. This information together implicated that the impairment brought by ECT might be overestimated. However, more prospective cohort studies are needed to evaluate the long-term impact on the patients.

## 5. CONCLUSION

In summary, from the current review, we concluded that the use of ECT in Chinese psychiatric hospitals is frequent and accepted by most of the patients. However, more information should be provided to the patients and their relatives prior to the treatment. ECT showed its potential to reduce the suicide rates however more studies are warranted in the future to detect its potential risk.

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