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Electroconvulsive therapy and its relationships with clinical characteristics and quality of life in Chinese psychiatric patients

Feng-Rong An[a,1], Ling Zhang[a,b,1], Qing-E. Zhang[a,1], Gabor S. Ungvari[c,d], Chee H. Ng[e], Helen F.K. Chiu[f], Ping-Ping Wu[a], Xin Jin[a], Lu Li[b], Grace K.I. Lok[b,g], Yu-Tao Xiang[b,*]

[a] National Clinical Research Center for Mental Disorders & Beijing Anding Hospital, Capital Medical University, China
[b] Unit of Psychiatry, Faculty of Health Sciences, University of Macau, Macao SAR, China
[c] The University of Notre Dame Australia/Marian Centre, Perth, Australia
[d] School of Psychiatry & Clinical Neurosciences, University of Western Australia, Perth, Australia
[e] Department of Psychiatry, University of Melbourne, Melbourne, Victoria, Australia
[f] Department of Psychiatry, Chinese University of Hong Kong, Hong Kong SAR, China
[g] Kiang Wu Nursing College of Macau, Macao SRA, China

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ABSTRACT

Little is known about the pattern of electroconvulsive therapy (ECT) use in the clinical population in China. This study examined the percentage of ECT use and its association with clinical characteristics and quality of life (QOL) in a psychiatric center in China that caters for a population of 20 million. A total sample of 1364 inpatients was consecutively recruited for the study. Demographic and clinical data including the use of ECT were collected. Psychopathology, activity of daily living and QOL were measured using standardized instruments. The percentage of ECT use was 52.1% in the whole sample; 53.4% in major depression, 57.8% in bipolar disorder, 57.0% in schizophrenia and 32.4% in other diagnoses. There was no significant difference between the ECT and non-ECT groups in any domain of QOL. Multivariate analyses revealed that ECT was independently associated with the diagnoses of major depression, bipolar disorder and schizophrenia, physical restraint, severe aggression, better activity of daily living skills, more frequent use of antipsychotics and less frequent use of benzodiazepines. The percentage of ECT use was much greater in a major psychiatric center in China than those reported from other parts of the world. Use of ECT had no influence on the short-term QOL. Further investigations are warranted to explore the reasons for the high percentage of ECT use.

1. Introduction

Electroconvulsive therapy (ECT) is effective for severe psychiatric disorders, especially those resistant to pharmacotherapy (APA, 2008; Dos Santos-Ribeiro et al., 2016; Yatham et al., 2013). Clinical patterns of ECT use vary greatly across the world. For example, ECT is usually used for major depression and only rarely for schizophrenia in many Western countries (Leiknes et al., 2012; Munk-Olsen et al., 2006; Sienaert et al., 2006). In many Asian countries, it is mainly used for schizophrenia (Little, 2003; Payne and Prudic, 2009; Xiang et al., 2015b) where up to 68% of Asian patients with schizophrenia receive ECT (Chanpattana et al., 2010; Little, 2003).

The bulk of the literature on ECT originates from Western settings. In China, approximately 150,000 ECT sessions are performed annually (Jiang et al., 2011), resulting in probably the largest patient population receiving ECT in the world (Tang et al., 2012). The choice of ECT is strongly influenced by a host of legal, social and cultural factors (Vera et al., 2016; Xiang et al., 2015), therefore findings obtained in Western settings could not be generalized to China where there is different economic and sociocultural environment.

Information about the pattern of ECT use in Chinese hospitals is limited. The proportion of ECT use in schizophrenia increased from 0.5% in 1999 to 5.6% in 2008, according to a study in Beijing (An et al., 2010). Other studies also reported an increasing trend in using ECT for schizophrenia in China. However, a common limitation of these studies was the lack of standardized instruments for measuring changes in psychopathology. Furthermore, to the best of our knowledge no studies have explored the impact of ECT on quality of life (QOL).

The aim of this study was to examine the percentage of ECT use in a consecutively recruited sample of patients admitted to the National

* Correspondence to: Faculty of Health Sciences, University of Macau, 3/F, Building E12, Avenida da Universidade, Taipa, Macau SAR, China.
E-mail address: xyutly@gmail.com (Y.-T. Xiang).
[1] These authors equally contributed to this work

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Clinical Research Center for Mental Disorders, Beijing, China, and to determine the clinical and QOL correlates of ECT.

2. Methods

2.1. Participants, study site and time-frame of the study

The study was conducted at China's National Clinical Research Center for Mental Disorders between February 1, and August 31, 2013. This is a tertiary referral center which has 800 beds, receives 1100 outpatient visits daily and serves approximately 20 million people in Beijing and other parts of China.

During the study period, all consecutively admitted patients aged 18 years and older were screened for the following study entry criteria: (1) ability to understand the essence of the study and (2) willingness to provide written informed consent. There were no exclusion criteria. The study protocol was approved by the Biomedical Ethics Board of the National Clinical Research Center for Mental Disorders, Beijing, China.

2.2. Instruments and evaluation

Patients' basic demographic and clinical characteristics were assessed by reviewing the medical records and later confirmed with a clinical interview. Physical restraint refers to four-point restraint to a bed (Martin et al., 2007; Zhu et al., 2014). ICD-10 diagnoses at discharge were collapsed into four groups: major depression, bipolar disorder, schizophrenia or other psychotic disorders (thereafter: schizophrenia) and others. The principal diagnosis was used if the patient had more than one diagnoses.

Psychological symptoms and psychopathology were evaluated with the validated Chinese version of the Symptom Checklist-90 (SCL-90); its 90 items are grouped into nine dimensions: somatization, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Each dimension is rated on a 5-point scale ranging from 0 (absence of the symptom) to 4 (maximum intensity score for the symptom) (Chen and Li, 2003). Insight at admission was evaluated using the validated Chinese version of the Insight and Treatment Attitudes Questionnaire (ITAQ) (Gao et al., 1998; McEvoy et al., 1981). The ITAQ consists of 11 questions; each rated on a 3-point scale: 0=no insight; 1=partial insight; 2=good insight.

Aggression at admission was evaluated using the validated Chinese version of the Buss-Perry Aggression Questionnaire (BPAQ) (Buss and Perry, 1992; Lv et al., 2013) that consists of 29 items addressing four components: physical aggression, verbal aggression, anger and hostility. Each item is rated from 1 to 5. A higher score indicates more severe aggression. Activities of daily living (ADL) were assessed using the validated Chinese version of the 14-item Activity of Daily Living scale (He, 1990; Lawton and Brody, 1969). A higher score reflects poorer skills of daily activity.

QOL immediately after the course of ECT was assessed with the validated Chinese version of the Medical Outcomes Study Short Form 12 (SF-12) (Jenkinson and Layte, 1997; Zhang et al., 2011). The SF-12 is a multidimensional generic instrument of 12 items addressing eight health domains: physical functioning, role limitations due to physical problems, bodily pain, vitality, social functioning, role limitations related to emotional problems and mental health. For the purpose of statistical analysis, the first four domains were collapsed into a physical component score, while the remaining four domains formed the mental component score. The SF-12 has been validated in Chinese population (Cronbach's α of the eight domains: >0.88; convergent validity of the eight domains: >0.78) (Zhang et al., 2011). A higher score on SF-12 indicates better QOL.

Two registered psychiatric nurses with >5-year experience in clinical practice and research interviewed all patients using the above instruments within 48 h after admission.

2.3. Statistical analysis

All data were analyzed using SPSS 21.0 for Windows. Basic sociodemographic and clinical characteristics between the ECT and non-ECT groups were compared using independent sample *t*-test, Mann-Whitney *U* test, and chi-square test, as appropriate. QOL was compared between the two groups with analysis of covariance (ANCOVA) after controlling for the potentially confounding effects of variables that significantly differed between the two groups in above univariate analyses. Multiple logistic regression with the "Enter" method was used to determine the independent correlates of ECT, with ECT as the dependent variable and variables that significantly differed in univariate analyses as independent variables. The level of significance was set at 0.05 (two-tailed).

3. Results

Of the 1475 patients admitted during the study period, 1364 met the study criteria and participated in the study giving a recruitment rate of 92.4%. A total of 710 patients (52.1%) received ECT, of which 53.4% had major depression, 57.8% bipolar disorder, 57.0% schizophrenia and 32.4% other diagnoses ($x^2=50.9$, df=3, $p<0.001$). The mean number of sessions was 7.4 ± 2.8.

Patients receiving ECT were younger, had higher education level and younger age of onset, were less likely to be employed, had personal income more than 3000 RMB per month, and received benzodiazepine. They were also more likely to be diagnosed with major depression, bipolar disorder and schizophrenia, be physically restrained, receive antipsychotics, and have higher BPAQ and lower ADL total scores at admission (Table 1). After controlling for the confounding effects of the variables that significantly differed between the two groups in univariate analyses, there were no differences in both the physical ($F_{(12,1364)}=0.004$, P=0.94) and mental domains of QOL ($F_{(12,1364)}=0.6$, P=0.40).

Multiple logistic regression analyses revealed that ECT was independently associated with the diagnoses of major depression, bipolar disorder and schizophrenia, physical restraint, more severe aggression, better ADL skills, more frequent use of antipsychotics and less frequent use of benzodiazepines (Table 2).

4. Discussion

The percentage of inpatients receiving ECT in this study was 52.0%, a figure lower than a recent Chinese survey showing 61.9% (Wang et al., 2015). Wang et al.'s study retrospectively ascertained the cumulative rate of ECT between 2007 and 2013, which may account for the higher percentage.

ECT is used more frequently in a major tertiary center in China than other parts of the world: the corresponding rates reported being 0.01% in Thailand, 0.79% in Poland, 1.6% in Hungary, 1.8% in Hong Kong, 1.2–7.4% in the USA, 4.1% in Sweden and 9% in Denmark (Chanpattana, 2010; Chung, 2003; Gazdag et al., 2009, 2013; Little, 2003; Stromgren, 1988; Trivedi, 2002). An exception maybe in India where ECT is also used frequently (Chanpattana et al., 2005), for example Xiang et al. (2015b) reported that 13.8% of hospitalized schizophrenia patients received ECT in India.

Consistent with this study, ECT most commonly treats major depression, bipolar disorder and schizophrenia in China, particularly for patients with suicidal or aggressive behavior, and catatonia (Wang et al., 2015). However, there are several possible reasons for the common use of ECT. The National Clinical Research Center of Mental Disorders is a tertiary referral center that receives treatment-resistant patients from other hospitals who are more likely to meet the indications for ECT than in other psychiatric facilities in China. In addition, sociopolitical factors and clinical traditions may be associated with the common use of ECT (Xiang et al., 2015b). Due to the very