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การศึกษาประโยชน์การตรวจคลื่นไฟฟ้าสมอง ผู้ป่วยจิตเวชในสถาบันจิตเวชศาสตร์สมเด็จเจ้าพระยา

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บทคัดย่อ

วัตถุประสงค์ เพื่อศึกษาความสัมพันธ์ของการวินิจฉัยโรค กับการตรวจคลื่นสมองในผู้ป่วยจิตเวช

วัสดุและวิธีการ ศึกษาย้อนหลังจากข้อมูลการตรวจคลื่นไฟฟ้าสมอง ข้อมูลทางคลินิกก่อนและภายหลังการตรวจจากเวชระเบียนผู้ป่วยจิตเวชที่ส่งตรวจโดยจิตแพทย์ตามเงื่อนไขการศึกษา วิเคราะห์ด้วยสถิติเชิงพรรณนา

ผล จำนวนบันทึกคลื่นสมอง 102 ฉบับจำแนกเป็นเพศชายร้อยละ 62.7 อายุระหว่าง 15-65 ปี ร้อยละ 62 อาศัยอยู่กรุงเทพฯและปริมณฑล การศึกษาระดับสูงกว่ามัธยมศึกษาร้อยละ 23 เป็นผู้ไม่มีรายได้ร้อยละ 63.7 วินิจฉัยโรคจิตอารมณ์ร้อยละ 27.5 การแสดงอาการชนิดเฉียบพลันร้อยละ 17.6 ชนิดเรื้อรังร้อยละ 49.0 ชนิดเป็นๆหายๆร้อยละ 33.3 ผลคลื่นสมองวินิจฉัยลมชักร้อยละ 13 สมองอักเสบร้อยละ 7 เปลี่ยนแปลงการรักษาร้อยละ 52.9 การวินิจฉัยโรคกับผลตรวจ การเปลี่ยนแปลงการรักษาภายหลังทราบผลการตรวจคลื่นสมองมีความสัมพันธ์กันอย่างมีนัยสำคัญ

สรุป การส่งตรวจคลื่นไฟฟ้าสมองสำหรับจิตแพทย์ให้ผลบวกต่ำมาก มีประโยชน์ในกรณีที่วินิจฉัยเฉพาะกลุ่มทำให้มีการเปลี่ยนแปลงการรักษา

คำสำคัญ : ตรวจคลื่นสมอง ผู้ป่วยจิตเวช

สถาบันจิตเวชศาสตร์สมเด็จเจ้าพระยา

The use of EEG as a diagnostic tool for psychiatric patients, a retrospective study in Somdet Chaopraya Institute

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Abstract

Objective This study was aimed to evaluate the use of EEG in psychiatric patients.

Materials and methods Psychiatric patients consulted for EEG by psychiatrists during 2010 and 2012 were reviewed. The general data and clinical data both pre and post EEG investigation were analyzed by descriptive statistic.

Results There were 102 EEG recordings, of these 62.7% were male, age between 15-65 years. Most lived in Bangkok and suburban. Around one forth of cases were graduated higher than high school. About two thirds had no income. Psychosis was diagnosed in 61.8%, 10.8% affective disorder and 27.5% mixed psychotic disorder. Clinical presentations found 17.6% acute type, 49.0% chronic type and 33.3% intermittent type. EEG consultation was requested in order to rule out epilepsy at 92.2%. EEG results were normal at 80.4%, 13% were epilepsy and 7% were encephalitis. After EEG study, 52.9% of cases had changed treatment.

Conclusion EEG finding in psychiatric patients yielded very low positive findings for epilepsy. However, in a positive finding case, it is benefit for treatment.

Key words : EEG, psychiatric patients

Somdet Chaopraya Institute

Introduction

Electroencephalography (EEG) is one of the principle investigative tools of cerebral function. It is widely accepted as a valuable test in many conditions. Two familiar basic EEG findings are slow activity and epileptiform activity. Slow activity is a nonspecific finding that indicates dysfunction of the underlying white matter, with or without gray matter involvement. Focal slow activity indicates a focal area of cortical dysfunction which is usually caused by a focal structural lesion (tumor, stroke, trauma, etc.), although a lesion is not always found. Diffuse abnormalities on EEG suggests a diffuse brain degeneration or encephalopathy. Epileptic or seizure activity which is seen as spike or sharp wave forms indicates potential for epileptic seizures. EEG technologists may use activation procedures such as hyperventilation and photic stimulation to enhance the ability of EEG to detect epileptic activity[1,2]. Research has consistently demonstrated the benefit of EEG in distinguishing dementia from disorders such as metabolic encephalopathy. EEG may also be useful in distinguishing dementia from depression – related pseudodementia. EEG has an important role in distinguishing possible psychotic episodes and acute confusional state from complex partial seizures and non-convulsive status epilepticus[3-,5], and has more commonly than its role in diagnosing or distinguishing between psychiatric disorders and behavioral abnormalities, thus EEG remains a common requested test amongst psychiatrists to assess mental disorders5. EEG is a non-invasive and low cost investigation that can aid the diagnosis of psychiatric and neuropsychiatric disorders. For neurologists and psychiatrists in Somdet Chaopraya Institute, EEG is used mainly to diagnose and evaluate epilepsy and diffuse brain dysfunction such as coma and confusion states, and distinguish these organic brain symptoms from psychiatric disorders and behavioral abnormalities.

Nevertheless, the benefit of screening EEGs is still questionable. A review of routine screening EEGs in 115 psychiatric inpatients[6] demonstrated that EEG abnormalities were present in 31%, but the diagnosis was changed in 1.7% of cases. Moreover, no EEG abnormality was found when it was requested for investigating the episodes of aggression in 33 patients psychiatric service. A study in Thailand about EEG in psychiatric hospital showed EEG result did not affect treatment plan of psychiatrist[7]. Previous research on psychogenic non-epileptic seizures (PNES) studied by Harden et.al, showed that there was a significant difference in opinion regarding EEG results between psychiatrists and neurologists. Psychiatrist were shown to have a lot less confidence in reading EEG results and less accuracy in aiding the diagnosis of psychogenic symptoms than neurologists[8].

This study was aimed to explore the effect of EEG finding on diagnosis and treatment of psychiatric patients.

Materials and methods

All requested EEG and study reports of patients in Somdet Chaopraya Institute of Psychiatry Hospital during the year 2010-2012 were reviewed. EEG report referred by psychiatric hospital staffs or performed and reported by a consultant neurologists and their medical records were selected. Those EEG requested by non-institute's neurologists or by the non institute's doctors, and the samples that have no follow up reports or compliance after EEG study were excluded from this study. Ethical approval for this study was obtained from our institutional ethical committee. EEG findings results, reviewed and selected by a neurologist and study team were classified into two reported groups as 'normal' and 'abnormal' EEG. The abnormal EEG was subdivided into encephalopathy and epilepsy groups. Encephalopathy group was further divided into focal and diffuse groups, focal group refer to an abnormality found limited in an area of brain and diffuse group refer to global or generalized abnormality of brain. Patient characteristic profiles such as psychological diagnosis, this study part were review and select by psychologist and study team. These include clinical diagnosis, divided to psychosis, affective disorder, and combination of symptoms (No consideration by psychiatrist to be psychosis or affective disorder), patient treatment status at the time of EEG consultation, inpatient and outpatient, and the clinical course or clinical presentation at the EEG study time according to onset, duration, and recurrence or relapsing of illness, and then categorized by psychiatrist to acute, chronic and intermittent group. The referral reason for EEG study were documented, outcome data at the second time or 6 months follow up was obtained by retrospective chart review to ascertain the clinical impact of EEG results on patient management. The general demography such as age, gender, education level, habitat, and occupation were noted and collected by the study team clerk staffs.

Statistical analysis of the results included descriptive and chi-square analysis. Descriptive study was used for analyze patient's demography such as age, gender, habitat, career, educational level, clinical manifestation, clinical characteristics, EEG findings, and clinical outcome. Chi-square analysis was used to compare proportions of each topic detected between the different and to compare proportions of EEG finding, and clinical outcomes according to variables.

Results

Total of 200 patients referred for EEG investigation in the 2 years period between 1st January 2010 and 1st January 2012 were collected. One hundred and two EEG reports and medical records were selected. Demographic study, general profile of study include gender, age, habitat, education and economic status, demonstrate 102

patients, 62.7% were male, 51% having age between 25-45 year old. 84.3% lived in Bangkok and central region of Thailand. More than 80% of patient are under graduate and 63.4% were jobless and need family or social support.

Most of samples were inpatient (81%). The main diagnosis was psychotic disorder (61.8%), follow by mixed psychosis (27.5%). For clinical course, 49% were chronic, 33.3% were intermittent and 17.6% were acute. 79.4% of cases were consulted and referred for EEG study during inpatient admission. For EEG consultation reason, 82.2% were for ruling out epileptic disorder and the rest were for ruling out organic brain syndrome.

Table 1 Result of EEG finding

EEG finding	N = 102 (100%)
normal	82 (80.4%)
abnormal	20 (19.6%)
- epilepsy	13 (65.0%)
- organic	7 (35.0%)
: focal	5 (71.4%)
: diffuse	2 (28.6%)

Result of EEG finding, most were normal. In abnormal cases, 65% were epileptic disorder, 35% were reported encephalopathy. Most of encephalopathy were diffuse encephalopathy and 28.6% were focal encephalopathy (Table 1).

Table 2 Relationship between clinical diagnosis and EEG finding

		EEG finding, n (%)			p-value
		normal	abnormal	total	
clinic diagnosis	psychosis	58 (56.9)	4 (4.9)	63 (61.8)	<.01
	affective disorder	11 (10.8)	0 (0.0)	11 (10.8)	
	mixed psychosis	13 (12.7)	15 (14.7)	28 (27.5)	

Table 2 showed the relationship between clinical diagnosis and EEG finding. This study showed significant relation between clinical diagnosis and EEG . Normal EEG was found to be the most EEG finding in both psychotic and affective groups, particularly in affective group with no abnormal EEG finding was detected. However, in mixed psychosis patients showed to have higher number/percent of abnormal EEG finding.

Table 3 Relationship among gender, clinical course, EEG finding and change of treatment

gender	clinical course			EEG finding		change of treatment	
	acute	chronic	intermittent	normal	abnormal	yes	no
male	10 (9.8)	32 (31.4)	22 (21.6)	51 (50.0)	13 (12.7)	31 (30.4)	33 (32.4)
female	8 (7.8)	18 (17.6)	12 (11.8)	31 (30.4)	7 (6.9)	23 (22.5)	15 (14.7)
p	0.78			0.81		0.25	

Chronic cases were the majority clinical course in both genders (Table 8). Normal EEG finding was found mostly in both genders, with the proportion of 1:4 between abnormal and normal EEG finding and changing treatment, post EEG finding, in male and female about 31% and 23%, consequently. The outcome of post EEG was very good (97.1%) of cases in both gender. No statistical significant was demonstrated among gender and clinical diagnosis, clinical course and EEG finding.

Table 4 Relationship among age at EEG study, clinical course, EEG finding and change of treatment.

age (years)	no. (%)	clinical course			EEG finding		change of treatment	
		acute	chronic	intermit	normal	abnormal	yes	no
15 - 24.9	17 (16.7)	4 (3.9)	6 (5.9)	7 (6.9)	13 (12.7)	4 (3.9)	10 (9.8)	7 (6.9)
25 - 34.9	21 (20.6)	4 (3.9)	11 (10.8)	6 (5.9)	16 (15.7)	5 (4.9)	13 (12.7)	8 (7.8)
35 - 44.9	31 (30.4)	5 (4.9)	19 (18.6)	7 (6.9)	24 (23.5)	7 (6.9)	17 (16.7)	14 (13.7)
45 - 54.9	17 (16.7)	3 (2.9)	7 (6.9)	7 (6.9)	14 (13.7)	3 (2.9)	8 (7.8)	9 (8.8)
55 - 64.9	14 (13.7)	2 (2.0)	6 (5.9)	6 (5.9)	13 (12.7)	1 (1.0)	6 (5.9)	8 (7.8)
> 65	2 (2.0)	0 (0.0)	1 (1.0)	1 (1.0)	2 (2.0)	0 (0.0)	0 (0.0)	2 (2.0)
total	102 (100)	18 (17.0)	50 (49.0)	34 (33.3)	82 (80.4)	20(19.6)	54 (52.9)	48 (47.1)
p			0.88		0.78		0.54	

Age study found more chronic clinical course under 45 years of age, and in case over 45 years found lessening abnormal EEG and post EEG treatment change. There was no statistical significant relationship found between age and clinical course, EEG finding.

Discussion

The patient with epilepsy may have behavior during seizure that mimic psychiatric disorder, and patients with epilepsy have higher than normal rate in many types of psychiatric illness. In patient with psychiatric illness has seizure-like episode, and abnormal EEG may help in confirming the diagnosis[9], as well as in patient with psychiatric or behavioral symptoms especially in old aged[10]. Although many studies showed unsatisfied comments to the lower positive results in psychiatrist EEG consultation. EEG is the non-invasive and low cost procedure and its ability to measure spontaneous brain activity attracts psychiatrist to use this investigative tool[11]. Most of all personal demographic factors such as gender or age show no significant relation to EEG finding and post EEG study management. The clinical demographic view found the clinical diagnosis, especially in mixed psychosis that shows significant relation to EEG finding. Cases of normal EEG finding may have allow the psychiatrist continue current treatment with more confidence and therefore be of some clinical benefit. If relate the study results altogether, these two significant studies to the clinical outcome this may indicate the better omniscient and skill of psychiatrist in managing the difficult care patients, they should have knowledge about sensitivity and specificity of EEG study as well as abnormal EEG related to antipsychotic medicine and can implicate the EEG result to treatment[12,13]. The lower number of epilepsy diagnosis in this EEG study as compared

to previous study in Thailand[5] may be due to the reason that this study did not include patients consulted to neurologists with highly suspicious of epilepsy, so these samples were ruled out by criteria. All the samples were psychotic cases treated by psychiatrists for a period of time until got unsatisfied result before being consulted for EEG study. The abnormal EEG finding cases in this study should be considered as difficult or atypical epilepsy or organic brain disease.

The limitations of this study is that as a retrospective review there may be bias introduced by incomplete data being available on medical record and EEG request form. This study suggests performing the further controlled study about EEG finding in patient with affective disorder or mixed psychosis and related clinical outcome.

Conclusion

EEG investigation in psychiatric patients yielded very low position finding for epilepsy. However, in a positive finding case, it was benefit for treatment.

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