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Application of EEG and Transcranial Doppler in Migraine Diagnosis

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ABSTRACT. *Objective to evaluate the application of EEG and transcranial Doppler detection in the diagnosis of migraine. Methods a total of 110 migraine patients treated in the Department of Neurology of our hospital in the past two years were selected, and 110 cases were selected as the observation group for this study. Another 110 persons who came to our hospital for a physical examination during the same period were selected as the control group. Electrogram and transcranial Doppler ultrasound. Observe and compare the results of EEG and transcranial Doppler ultrasound in the two groups. Results the abnormal rate of EEG and transcranial Doppler ultrasound in the observation group were higher than those in the other group, with statistical differences (P <0.05). From the observation group's EEG and transcranial Doppler color Doppler ultrasound examination results, the abnormal rate of transcranial Doppler color Doppler ultrasound examination was higher, which was statistically different from the EEG results (P <0.05). Conclusion EEG and transcranial Doppler ultrasound have certain reference effects for the diagnosis of migraine. Transcranial Doppler ultrasound has a higher accuracy rate. The combination of two clinical methods can reduce the misdiagnosis of migraine.*

KEYWORDS: *Migraine, Transcranial doppler ultrasound; EEG; Effect*

1. Introduction

Migraine is a more common type of primary headache in clinical practice. Headaches last for a long time, and some patients also have symptoms such as nausea, which seriously affects patients' lives. According to surveys, the global incidence of migraine is about 5% to 10%, and the incidence of migraine in some patients is significantly related to excessive drug use. Because migraine has a greater impact on patients' daily lives, in order to timely and effectively intervene in patients with migraine, it is necessary to diagnose the condition as soon as possible. In this study, a case study of migraine patients admitted to our hospital in the past 2 years and 110 healthy medical examiners who came to our hospital during the same period were selected for a comparative study to analyze the application of EEG and transcranial Doppler detection in the diagnosis of migraine effect.

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2. Materials and Methods

2.1 Normal Information

This study has been approved by the Ethics Committee of our hospital. We selected 110 patients with migraine treated in the neurology department of our hospital in the past 2 years, and selected 110 cases as the observation group for this study. Another 110 healthy people who came to our hospital during the same period were selected as the control group. All subjects were informed of this study. Observation group inclusion criteria: (1) all meet the diagnostic criteria for migraine in the International Classification of Headaches 3rd Edition; (2) non-acute episodes; (3) aged over 18 and under 80; (4) Willing to cooperate. The exclusion criteria for this study were: (1) patients with liver and kidney dysfunction; (2) patients with organic diseases such as the heart; (3) patients with other neurological diseases. In the observation group, there were 62 male patients and 48 female patients. The minimum age of the patients was 19 years, the maximum age was 42 years, and the median age was (29.41 ± 1.64) years. Among the control group, 65 were male and 45 were female. The minimum age of the patients was 21 years, the maximum age was 43 years, and the median age was (30.08 ± 1.61) years. There was no significant difference in general information between the two groups ($P > 0.05$), and subsequent comparisons were possible.

2.2 Method

All subjects received EEG and transcranial Doppler ultrasound. Observe and compare the results of EEG and transcranial Doppler ultrasound in the two groups. The EEG examination method is as follows:72 hours before the EEG examination, the subject is instructed to stop taking cerebrovascular dilatation drugs, and the patient is rested for 15 minutes before the examination. The Nicolet EEG electroencephalograph was used to check the members of the two groups. With reference to the international 10-20 system placement electrodes, the patients' awake EEG was recorded by single and bipolar tracing. The tracing time was above 030 minutes. The examination was completed by eyes closed and hyperventilation induced experiments.

Transcranial Doppler color Doppler ultrasound examination method is as follows: the subject is placed in the supine position, and the DWL color Doppler ultrasound is used for examination, the probe frequency is set to 2MHz, and the subject's bilateral middle cerebral artery, anterior and posterior cerebral artery are sequentially detected . After that, assist the subject to adjust their position to detect the basilar artery and vertebral artery. During the detection, pay attention to observe the average blood flow velocity and other indicators of different arteries.

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2.3 Judging Criteria

EEG diagnosis refers to the "EEG diagnostic criteria", that is, it is divided into mild, moderate and severe abnormalities, mild abnormal EEG visible background activity changes significantly; moderate abnormal EEG visible background activity waveform and A few spikes; severe abnormal EEG shows slightly more slow waves and more spikes[3].

Transcranial Doppler color Doppler ultrasound abnormalities refer to normal blood flow velocity, that is, the peak of systolic peak of middle cerebral artery exceeds 72cm / s, lower than 115cm / s; the peak of systolic peak of posterior cerebral artery exceeds 36cm / s, lower than 63cm / s; The peak value of the anterior artery systole exceeds 56 cm / s, which is lower than 92 cm / s; the peak value of the basal artery systole exceeds 45 cm / s, which is lower than 78 cm / s[4-5].

2.4 Statistical Methods

The two sets of data were processed by SPSS21.0 software package, and the count data was expressed as the number of cases and percentages, and the chi-square test was used. The difference was statistically significant at $P < 0.05$.

3. Results

3.1 Comparison of EEG Results between the Two Groups

The abnormal rate of EEG in the observation group was higher than that in the other group, with a statistical difference ($P < 0.05$). Details are shown in Table 1.

Table 1 the Abnormal Rate of EEG in Two Groups

Group	Mildly abnormal	Moderately abnormal	Severe anomaly	Abnormal rate(%)
Observation group	29	25	5	53.64
Control group	7	4	1	10.91
X^2				8.116
P				<0.05

3.2 Comparison of Transcranial Doppler Color Doppler Ultrasound Results

The abnormal rate in the observation group and transcranial Doppler color Doppler ultrasound was higher than that in the other group, with statistical differences ($P < 0.05$). Details are shown in Table 2.

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Table 2 Comparison of Abnormalities in Tcd Test Results between the Two Groups

Group	Basilar artery	Posterior cerebral artery	Anterior cerebral artery	Middle cerebral artery	Abnormal rate(%)
Observation group	17	23	12	34	78.18
Control group	5	1	7	5	16.36
X^2					8.704
P					<0.05

3.3 Comparison of the Abnormal Rate of Diagnosis in the Two Observation Methods of the Observation Group

From the observation group's EEG and transcranial Doppler color Doppler ultrasound examination results, the abnormal rate of transcranial Doppler color Doppler ultrasound examination was higher, which was statistically different from the EEG results (P <0.05). Details are shown in Table 3.

Table 3 Comparison of Abnormal Rates of EEG and Tcd in the Observation Group

Group	Normal	Abnormal	Abnormal rate(%)
EEG	51	59	53.64
TCD	24	86	7
X^2			5.839
P			<0.05

4. Discuss

Migraine is a more common type of primary headache, and it is also a chronic neurovascular disease. The triggering factors include migraine (menstrual cramps, ovulation, oral contraceptives, etc.), dietary factors (alcohol, nitrite-rich Meat, sodium glutamate, chocolate, etc.), psychological factors (stress, stress release), anxiety, anger, depressive behavior, environmental factors (flashing lights, concentration of vision, fluorescence, odor, etc.), sleep-related factors (sleep Lack of sleep, too much sleep) and head trauma, excessive fatigue, etc. Ordinary migraine (no threat) is the most common clinical type, accounting for about 80% of migraine[6]. There is no typical threat. Bitemporal and periorbital pain are common. Scalp tenderness often occurs during attacks. Vomiting can stop headaches related[7-8]. Headache symptoms often occur in patients with migraine. The duration of headache symptoms is about 4 to 72 hours, and some patients are also accompanied by nausea and light sensitivity, which are easy to relapse, which seriously affects the patient's life. The World Health Organization (WHO) published the World Health Report 2001 ranked common diseases by the number of years of healthy life lost, migraine ranked among the top 20, and severe migraine as the most disabling chronic disease. It has been reported in the literature that some migraine

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patients will experience transient neurological symptoms, such as dyskinesias, blurred vision, etc., usually before the onset of symptoms within 1 hour. Some migraine patients have more severe symptoms, cannot work and live normally, and need to be controlled by drugs. The loss to patients, families and the whole society is undoubtedly huge Migraine can occur in both men and women, but population-based studies have shown that the prevalence of women is three times that of men, and the disease usually begins in childhood, prepuberty in boys, and menarche in girls. Data show that migraine mainly affects young adults, with the highest prevalence around the age of 45, and then a downward trend. But elderly cases are also common. In view of the impact of migraine on patients' daily life, patients need to receive scientific intervention in a timely manner, which requires early diagnosis of the patient's condition.

EEG examination is a common way to detect neurological diseases. It is generally believed that the abnormal rate of EEG in migraine patients is higher than that in normal people, regardless of whether they are in the onset phase. In this study, the abnormal rate of EEG examination in the observation group was 53.64%, which was significantly higher than that in the control group. However, the electroencephalogram of patients with migraine is more volatile, which is mainly manifested by the emergence of moderate and high amplitude theta waves, especially in the case of excessive respiration, and the specificity of diagnosis is low[9].. Some studies suggest that there is no characteristic change in EEG performance in patients with migraine, so it cannot be used as the main basis for clinical diagnosis. Previous studies have suggested that the abnormal EEG examination of migraine patients may be due to increased release of vasoactive substances such as neurokinin A in the brain at the time of onset, making sensory nerve fibers more sensitive to external stimuli, and cerebrovascular activity during the onset of migraine patients. Dysregulation, the intensity of the patient's pain is higher, and the patient's headache time is prolonged, resulting in abnormal changes in the patient's EEG.

From the pathogenesis of migraine, when the sympathetic nerve is in an excited state, the blue spots of the brainstem are activated, noradrenergic transmitters are increased, and 5-HT neurons are also activated. A certain stimulating effect can increase vascular active substances such as calcitonin gene-related peptides, further expand blood vessels, and make the trigeminal nerve nociceptors more sensitive to external stimuli and produce pain. At the same time, when the vasodilation caused by the dysfunction of intracranial and extracranial vasomotor regulation causes the blood flow to pass through the spasm, the local laminar flow disappears leading to the emergence of end currents, which increases the release of metabolites such as lactic acid, stimulates the trigeminal nerve, and induces migraine[10].Transcranial Doppler color Doppler ultrasound is an intracranial arterial ultrasound examination. It is mainly based on normal blood flow velocity and examination data to determine the intracranial hemodynamic changes of the subject, and to analyze the relative parameters of cerebral blood flow. In transcranial Doppler color Doppler ultrasound examination of patients with migraine, the blood flow speed becomes faster and the spectrum morphology changes are the most common. In some elderly migraine

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patients, due to poor vascular elasticity, the blood flow rate is often slowed down during examination, and there is a certain difference in hemodynamics on both sides.

In this study, the abnormal rate of EEG and transcranial Doppler color Doppler ultrasonography in the observation group were higher than those in the other group, with statistical differences (P <0.05). From the observation group's EEG and transcranial Doppler color Doppler ultrasound examination results, the abnormal rate of transcranial Doppler color Doppler ultrasound examination was higher, which was statistically different from the EEG results (P <0.05). From this result, both EEG and transcranial Doppler ultrasound have certain reference effects for the diagnosis of migraine. Transcranial Doppler ultrasound has a higher accuracy rate. The combination of the two clinical methods can reduce the bias. Misdiagnosis of headache.

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