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Study on the Mechanism of "Arrest"-Example of Neiguan and Quchi Acupoints

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Abstract: “Arrest”, one of the four martial arts techniques, has the effect of pulling one hair and moving the whole body; It also has the power to divide muscles, bones, grasping meridians and pulse. This paper focuses on the experimental method, logical analysis, literature research and other methods to study the physiological mechanism of “Arrest”, which is not only conducive to a clear explanation of the biomechanical mechanism of “Arrest”, but also conducive to provide scientific method guidance for the actual combat training of “Arrest”. The results prove that: 1) Acupoint grabbing will affect the brain waves, which will cause the body to spasm; 2) Through the Comparative study with the brain wave waveform of the body's epilepsy caused by the disease, the brain wave generated after acupoint arrest is different from the waveform produced by epilepsy lesions, and it is concluded that the physiological changes of the body after acupoint arrest are similar to the pathology of epilepsy; 3) By observing the rhythm changes of different waveforms of α, β, θ, and δ of the same subject before and after the experiment after grasping acupoints and non-acupoints, it is concluded that the acupoints have a greater degree of abnormality in human brain waves.

Keywords: Mechanism, Fighting, Brain Waves, Quchi, Acupoints

1. Topic Introduction

1.1. Topic Selection Basis

In the early 30 years of the founding of the People's Republic of China, the turmoil of martial arts was suppressed, which destroyed the orderly inheritance of martial arts and weakened the historical precipitation of martial arts; as the most practical technique of martial arts, grappling and holding is the most practical technique in martial arts, and they dare not "show up" and can only let it decline. Martial arts arrest is relatively unfamiliar, and even doubt whether it really exists. In the context of the "world village", fighting projects from all over the world are communicated on the same screen, and fighting projects with richer technologies are favored by athletes and audiences. Taking MMA as an example, it consists of standing kicks, punches, falls, elbows, knees, and submission skills after being dragged into the ground. According to its technical characteristics, perfect rules, safe protective gear, professional referees and scientific emergency response are formulated. With rich changes in grappling, free attack and defense, and a complete system, the successful launch of mixed martial arts projects provides an idea for the integration of martial arts grappling into fighting projects [1]. Compared with mixed martial arts ground subjugation skills, traditional Chinese arrest is not just a simple physical lever, but also has an unknown internal mechanism. The purpose of this paper is dedicated to discover what makes “arrest” so efficient that it can win over opponent by few tricks. In order to find what makes “arrest” work, we set up a series experiments to discover the true reason why “arrest” is so effective during combats.

1.2. Literature Review

1.2.1. Domestic and Foreign Research Present Situation

By consulting a large number of domestic and foreign literatures, the foreign research on Chinese martial arts arrest technology and technical theory is blank; although domestic research is not deep enough, it only stays on the teaching of a single movement, and the technical explanation only cites "points". Empty clichés, such as "stretching the muscles and grasping the veins, sticking and sticking", are not clear and specific, the theory of grasping and grasping is lacking, and the overall technique is not systematic. The arrest situation is in jeopardy and urgently needs to be rescued!

1.2.2. Analysis of the Current Situation of Research on Arrest Technique

"Arrest" is based on hitting, pinching and grasping. Its practical technique combines rigidity and softness, yin and yang changes, and Zhou Liuyuan is alive. The force is borrowed from the body. It defines "arrest" as a practice of the coordination between hands, eyes, body and footwork [2]. Moving inward and outward is a trick for trapping opponents. Its briskness and firmness make enemy powerless. With rich content and profound mechanism, it has extremely high research and practical value. Deep learning of "arrest" requires knowledge of human anatomy and kinetic medicine. The scientific explanation of "arrest" still requires our exploration.

1.2.3. Overview of Arrest

Arrest is an excellent traditional practice of Chinese martial arts. Due to its distinctive attacking technique, it has been valued by soldiers of all dynasties. The "arrest" technique brings together the essence of Chinese martial arts and is the most important physical combat technique in hand-to-hand combat and special practical technology [3]. As the essence of traditional Chinese martial arts, "arrest" extracts the essence of ancient Chinese martial arts. As means of self-defense or warrior weapon, "arrest" represent a kind of Chinese spirits that triumph is not about bloody fighting but winning without hurting opponents [4]. This kind of spirit is also shown in traditional Chinese religion. Taoists, Confucianism and military strategists exemplify this spirit.

1.2.4. Historical and Cultural Connotation of Arrest

As the essence of traditional Chinese martial arts, grappling extracts the essence of ancient Chinese martial arts. From self-defense to the current use of force to stop fighting, to cultivate the spirit of martial arts with the goal of not fighting or harming the opponent to achieve the ultimate victory, this is the realm pursued by martial arts practitioners. It also reflects this connotation [5-7].

1.2.5. Theory of "Arrest"

Knowledge is the source of skill. If you only learn the skills and don't understand the rationale, you can only learn it for a while, and it has a great blindness. In order to know the essence of "arrest", we have to know traditional Chinese medicine.

1) Meridian in Chinese medicine [8].

Chinese medicine believes that the natural world is a big universe, the human body is a small universe. The heaven, earth and all things are interconnected and interconnected, and they are a whole; To ensure the normal function of human activities, there must be a balance between man and nature. Chinese medicine says: "Qi and blood are the source of life for life", and the path of Qi and blood is the meridian.

2) The theory of Ziwu Liuzhu [9].

Ziwanliu is the acupuncture point of Chinese medicine. Its effect is obvious. There are heads and neck points, two arms acupoints, and double main components from the human parts. The theory of Ziwu Liusun believes that the operation of the Qi and blood is a large circulation channel in accordance with a certain time.

3) Acupuncture [10, 11].

There are four kinds of acupoint selection methods: "Bone Degree Method", "Cun Finger Method", "Specific Method" and "Action Method". To practice acupoint-pointing in martial arts, it is necessary to practice acupoint-selecting skills intensively, in order to see the miraculous effect of acupoint-pointing in the middle of the fight. The practitioner should understand all four methods, and it needs to be done step by step and practice makes perfect in order to select the key acupoints. In particular, the "special method" and "action method" are more suitable for martial arts acupoints, such as the Meixin point between the eyebrows, the Renzhong point between the nose, the perine point for the crotch, the throat point for the front of the neck, etc. "Action method", when the opponent raises his arm to make a move, use Jiquan acupoint in the middle of the armpit; when bowing his head into the body, use Dazhui acupoint at the middle end of the back of the head and neck when throwing a move, and etc.

1.3. Research Pathway

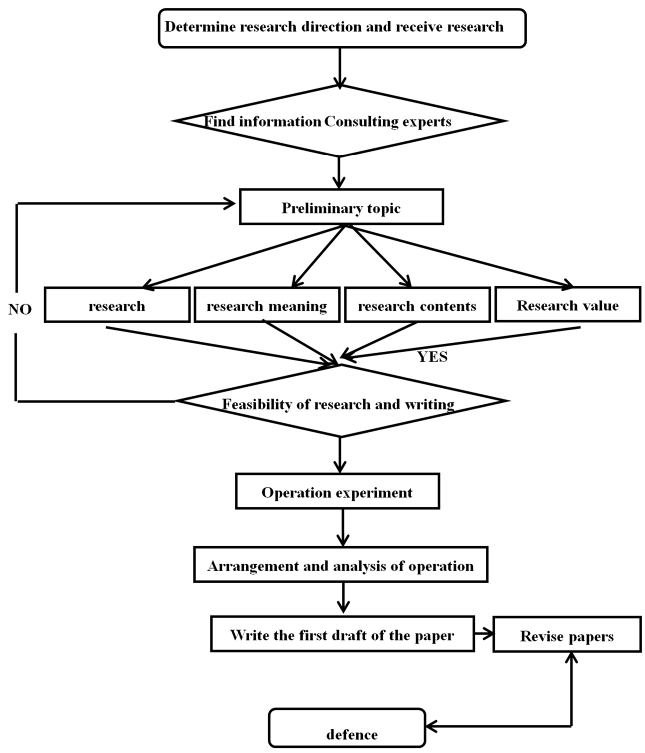

Figure 1. *Research on the technology roadmap.*

2. Test Subject and Method

2.1. Test Subjects

Test subjects:

Randomly select 8 from the 2015-level postgraduate martial art sanda special class of Beijing Sport University.

Selection of test subjects:

Eight students from the 2015-level postgraduate martial art sanda special class of Beijing Sport University were randomly selected as the experimental subjects, and the subjects underwent physical examination according to medical standards (Table 18) to exclude the experimental subjects from interfering with the experimental results due to their own physical problems.

Table 1. *Basic information and test results of 8 subjects.*

Name	Ages	Weight	Year		Internal Medicine				Surgery					
					Heart	Liver	Spleen	Lung	Head	Neck	Breast	Body	Skin	SpinE
Du	27	67	9	二	√	√	√	√	√	√	√	√	√	√
Sun	25	68	7	二	√	√	√	√	√	√	√	√	√	√
Tian	26	62	8	二	√	√	√	√	√	√	√	√	√	√
Yang	25	64	6	二	√	√	√	√	√	√	√	√	√	√
Zhang	26	67	7	二	√	√	√	√	√	√	√	√	√	√
Zhao	26	66	8	二	√	√	√	√	√	√	√	√	√	√
Zheng	27	73	7	二	√	√	√	√	√	√	√	√	√	√
Zou	25	77	6	二	√	√	√	√	√	√	√	√	√	√

Note: "√" means within the normal range.

2.2. Research Methods

2.2.1. Documentation Method

Checked out 217 related documents and more than 60 books in the library of Beijing Sport University, CNKI Chinese Journal Full-text Results Database, and Excellent Master's and Doctoral Dissertation Databases. Collected relevant literature on the factors affecting EEG and the influence of acupoint stimulation on EEG to provide theoretical basis for the selection of the thesis, the design of the research plan, the organization of the experiment, the analysis of the results and the writing of the thesis.

2.2.2. Experimental Method

(i). Introduction of Experimental Equipment

Figure 2. *Nation9128W Digital EEG.*

In this paper, the Nation9128W digital electroencephalograph produced by Shanghai Nuocheng Company was used (Figure 2). The main components of the instrument are brain electrode, electrode cap, lead holder, EEG amplifier (Model EEG-20), lead wire, computer, wireless Bluetooth receiving box and professional software.

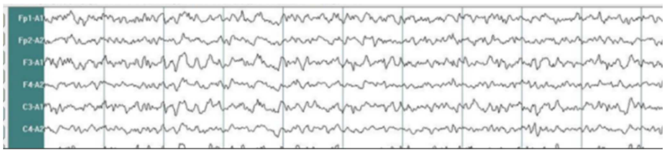

Figure 3. *Digital filter parameter settings.*

(ii). The Meaning of EEG Indicators

1) Energy value (absolute power): It is the actual EEG power value calculated by each frequency band, that is, the energy value, and the unit is uv2.
2) Percentage of energy between channels (relative power): It represents the ratio of the power value of each frequency band divided by the total power, and its significance is to compare the proportion of each frequency band in the brain area.
3) Percentage of energy per channel: The percentage of energy of a certain frequency band in each brain region to the total energy of the whole brain in that frequency band, the significance of which is to compare the proportion of each frequency band in different brain regions.

(iii). EEG Test Site and Data Collection Method Before the Experiment

1) Let the subject sit on a chair with a backrest, and adjust the electrode cap according to the size of the subject's head to make it tight and fit.

2) After wearing the electrode cap, adjust the sitting posture so that the back rests on the chair, and the whole body is relaxed. After the posture is adjusted properly, do not move, and prepare to place the electrodes (the electrodes need to be soaked in saline). The electrodes are placed in accordance

with the international 10/20 system. The center of the forehead is the ground electrode, the earlobes are the reference electrodes, plus FP1 (left forehead), FP2 (right forehead), F3 (left forehead), and F4 (right forehead) pole), C3 (left central pole), C4 (right central pole), P3 (left parietal pole), P4 (right parietal pole), O1 (left occipital pole), O2 (right occipital pole), F7 (left anterior temporal pole) pole), F8 (right anterior temporal pole), T3 (left middle temporal pole), T4 (right middle temporal pole), T5 (right middle temporal pole), T5 (left posterior temporal pole) and T6 (right posterior temporal pole), a total of 19 electrodes. The parts where the electrodes are placed should be degreased and cleaned, and the electrodes should be installed. During the test, the subjects are required to keep quiet, close their eyes, try not to turn their eyes, and keep their minds clear. After the signal stabilized, the EEG was continuously recorded in a quiet and awake state with eyes closed for a total of 2 minutes, as shown in Figure 4.

After the experiment, the collected data were classified and processed to obtain a digital EEG topographic map, as shown in Figure 5.

Figure 4. EEG test in quiet state.

	FP1	FP2	F3	F4	C3	C4	P3	P4	O1	O2	F7	F8	T3	T4	T5	T6
	33.3	31.2	42.2	26.2	43.5	20.7	47.9	29.6	59.1	53.8	31.6	19.9	49.2	15.5	25.4	24.9
δ	36.2%	43.2%	32.4%	42.7%	35.6%	32.4%	38.1%	33.5%	34.2%	36.5%	34.1%	39.1%	34.4%	41.7%	34.2%	40.1%
	6.0%	5.6%	7.6%	4.7%	7.9%	3.7%	8.6%	5.3%	10.7%	9.7%	5.7%	3.6%	8.9%	2.8%	4.6%	4.5%
	37.9	24.8	60.3	20.6	50.9	24.2	42.2	25.2	42.9	36.2	39.7	18.2	66.0	10.8	22.9	14.8
θ	41.2%	34.4%	46.3%	33.7%	41.6%	37.9%	33.5%	28.4%	24.8%	24.6%	42.8%	35.9%	46.1%	28.9%	30.9%	23.9%
	7.0%	4.6%	11.2%	3.8%	9.5%	4.5%	7.8%	4.7%	8.0%	6.7%	7.4%	3.4%	12.3%	2.0%	4.3%	2.8%
	6.7	4.2	9.6	4.4	8.8	7.4	16.2	21.7	33.0	38.0	5.7	3.3	7.6	5.3	9.7	9.9
α 1	7.2%	5.8%	7.3%	7.3%	7.2%	11.6%	12.8%	24.6%	19.1%	25.8%	6.2%	6.6%	5.3%	14.3%	13.1%	16.1%
	3.5%	2.2%	5.0%	2.3%	4.6%	3.9%	8.4%	11.3%	17.2%	19.8%	3.0%	1.7%	4.0%	2.8%	5.1%	5.2%
	7.1	7.9	9.7	7.2	11.0	9.3	12.1	7.7	23.9	11.2	7.9	6.5	12.7	3.2	9.2	7.7
α 2	7.7%	10.9%	7.4%	11.7%	9.0%	14.5%	9.6%	8.6%	13.9%	7.6%	8.5%	12.8%	8.9%	8.5%	12.3%	12.4%
	4.6%	5.1%	6.3%	4.7%	7.1%	6.0%	7.8%	5.0%	15.5%	7.3%	5.1%	4.2%	8.3%	2.1%	5.9%	5.0%
	4.7	2.6	5.8	1.7	5.7	1.4	5.5	3.1	10.9	6.6	5.1	1.9	5.3	1.6	4.8	2.9
β 1	5.1%	3.6%	4.5%	2.8%	4.6%	2.2%	4.3%	3.5%	6.3%	4.5%	5.5%	3.8%	3.7%	4.2%	6.4%	4.7%
	6.8%	3.8%	8.4%	2.5%	8.2%	2.0%	7.9%	4.4%	15.7%	9.5%	7.4%	2.8%	7.6%	2.2%	6.9%	4.2%
	2.3	1.5	2.8	1.1	2.4	0.9	2.0	1.3	2.9	1.6	2.7	0.9	2.3	0.9	2.3	1.7
β 2	2.5%	2.1%	2.1%	1.8%	2.0%	1.4%	1.6%	1.4%	1.7%	1.1%	2.9%	1.9%	1.6%	2.4%	3.1%	2.8%
	7.9%	5.1%	9.4%	3.6%	8.1%	2.9%	6.9%	4.2%	9.8%	5.5%	9.1%	3.2%	7.6%	3.0%	7.7%	5.8%

Figure 5. Digital topographic map of EEG.

(iv). Pre-Test Preparation and Precautions

(1) Preliminary preparation

a) Fully communicate with the subjects before the test to avoid the subjects' emotional tension during the experiment.

b) Subjects are required to ensure head hygiene so as not to affect the accuracy of the test.

c) The subjects are required to refrain from taking any drugs, alcohol or smoking 2 hours before the experiment.

d) The subjects were required to eat a balanced meal 2 hours before the experiment to avoid post-meal drowsiness or blood sugar instability affecting the experimental results.

(2) Precautions

a) Inform the approximate range of stimulation pain in advance to prepare the subjects for psychological preparation.

b) Inform the subjects in advance to open and close their eyes, breathe deeply and shallowly, etc. in the experiment.

c) Inform the subjects in advance to relax the whole body during the test, cooperate with the test operation and do not move freely.

(v). The Specific Operation Techniques and Action Essentials of Acupoint Arrest

Take the arrest of the Neiguan acupoint as an example, the hand is in a half-grip position, the female finger is upright, and the belly of the finger is used to press the one-inch gap between the ulna and the radius and cut downward with force. As shown in Figure 6.

Figure 6. Diagram of the essentials of grasping maneuvers.

(vi). Specific Arrangement of Acupoint Arrest Experiment

Using professional acupoint grabbing techniques, 8 subjects were uniformly selected for the experimental operation on Neiguan, Quchi, and Neiguan on the left arm of the non-acupoints within a distance of the index finger (as shown in Figure 6). Each experimental point was stimulated twice, each stimulation time was 15S, and the time interval between two stimulations was 24 hours.

Neiguan Point Test: December 12, 2017, 9:00 am;

Quchi Point Test: December 13, 2017, 9:00 am;

Non-acupoint test: December 14, 2017, 9:00 am.

During the experimental operation, Wang Ji, Li Moubo and Han Peng, three third-year graduate students of the Sports Human Body Department of Beijing Sport University, were invited to control the experimental instruments throughout the whole process. They have the experience of systematically learning and skillfully operating EEG instruments to prevent errors in the experimental data.

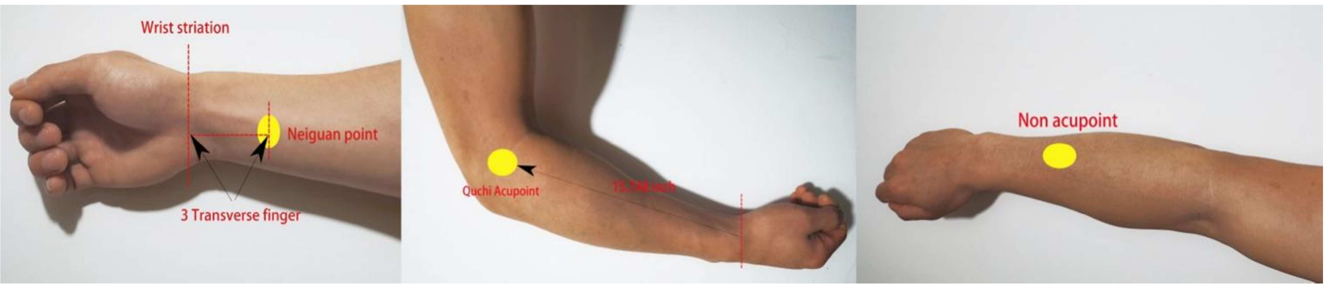

Figure 7. *Diagram of the location of Neiguan, Quchi and non-acupoints.*

2.2.3. Mathematical Statistics

Data are presented as mean ± standard deviation (mean ± SD). SPSS 19.0 software was used for data statistics. The data were tested for normality first. If the data obeyed the normal distribution, the one-way analysis of variance was used for the comparison between groups. The LSD method was used for multiple comparisons between groups when the variance was homogeneous, and the Tamhane's method was used when the variance was unequal. $P<0.05$ for the level, and $P<0.01$ for the very significant level; if the data did not obey the normal distribution, the nonparametric Mann-Whitney test was used for comparison between groups, the significance level was $P<0.05$, and the very significant level was taken $P<0.01$.

3. Results and Analysis

Radio waves are generally divided into 4 different rhythms (α, β, θ, δ rhythms). By consulting materials, we can master the frequency of α, β, θ and δ waves, the incentives for brain wave changes, and the distribution of brain regions. The problem is to provide theoretical support for the waveform changes after acupoint arrest stimulation studied in this experiment.

θwave: the frequency is 4~7Hz, the amplitude is 20-100uV, which means that the brain is in the state of inspirational thinking or deep thinking.

δ wave: The frequency is 0.5~3Hz and the amplitude is 20~200μV, which means that the brain is in a state of deep sleep without dreams. It is the basic waveform of the brain of infants and young children. Seen in the temporal and occipital lobes.

There are many factors that affect brain waves. There is a close relationship between normal brain waves and age. The younger the age, the less fast waves and the more slow waves, and the baseline instability; the older the age, the more fast waves and the less slow waves. However, if the body suffers from pathological changes, the abnormal hypersynchronized paroxysmal discharge of neurons in the brain will cause abnormal rhythms of α, β, θ, and δ waves, and the EEG instruments will present spike waves, sharp waves, spike waves, and sharp-slow complex waves., spike-slow complex wave and other abnormal waveforms. At the same time, when the above waveforms appear, it will cause a series of chain reactions such as disturbance of human heart pumping and destruction of the muscle contraction system. The body will produce involuntary tonic contractions., coma or even death in severe cases.

Based on the above theoretical support, this experiment is mainly aimed at the study of EEG beta waves (fast waves). The electrode cap is placed according to the international standard electrode placement method, as shown in Figure 8. The brain regions were divided according to international standards, as shown in Table 2.

Table 2. *10-20 Electrode name matching list of electrode system [7] a schedule of electrodes in 10-20 system.*

Location	English		Electrode name
forehead	Pre frontal lobe		Fp1, Fp2
Side forehead frontal region	Inferior frontal frontal lobe	lobe	F7, F8, F3, F4, F5
centre	Central lobe		C3, C4, Cz
Temporal region	Temporal obe		T3, T4
Posttemporal	Posteror temporal	lpbe	T5, T6
Parietal region	Parietal lobe		P3, P4, Pz
Occipital region	Occipital lobe		O1, O2
ear	Auricular		A1, A2

Note: Fz stands for frontal midline; Cz stands for midline; Pz stands for parietal midline

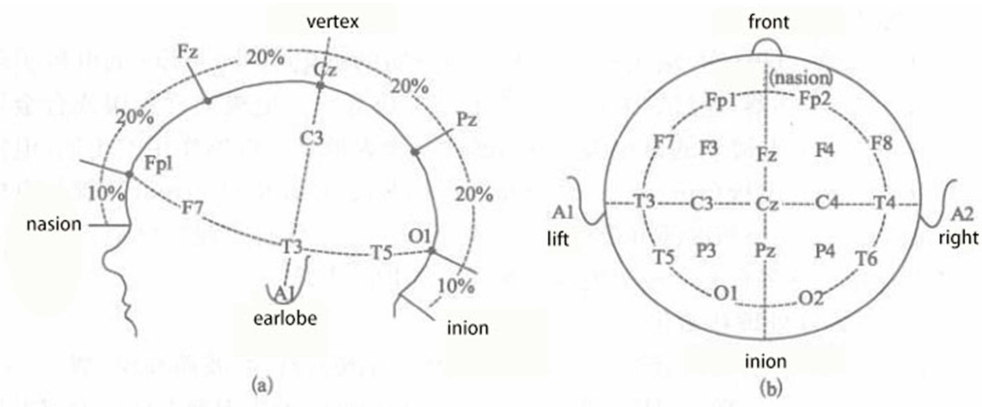

Figure 8. 10-20 international standard system electrode placement method (a) side view (b) top view.

3.1. Analysis of the Influence of Acupoints on Neiguan Acupoints on Human Brain Waves

3.1.1. Comparison of the Absolute Power of EEG Before and After the Acupoint Arrest Neiguan Point Experiment

In this experiment, 8 subjects were studied for self-control before and after the experiment. After collecting and sorting out the subjects, statistical t-test method was used to compare and analyze the experimental data. According to P value>0.05 (no significant difference) or P value <0.05 (significant difference) to judge the effect of acupoint grabbing on the subject's brain waves before and after the experiment, so as to explain the effect of acupoint grabbing on human brain waves. Table 3 shows the comparison results of the absolute power data of the six main brain waves after arrest Neiguan acupoint. Figure 9 is the absolute scale energy representation of the changes in the discharge volume of the six brain waves in different brain regions after arrest the Neiguan point.

Table 3. Comparison of absolute EEG power changes before and after the Qiana Neiguan point experiment (n=8).

Index	δwave	Θwave	α1wave	α2wave	β1wave	β2wave
Before experiment	280.9±216.28	1175.06±914.45	117.47±104.11	174.41±130.99	128.95±113.78	2078.70±1477.12
After experiment	2716.5±1582.7	3009.74±2435.18	348.84±330.30	1014.25±1316.33	533.09±462.47	8981.525±5043.67
P	0.004	0.067	0.096	0.113	0.041	0.004

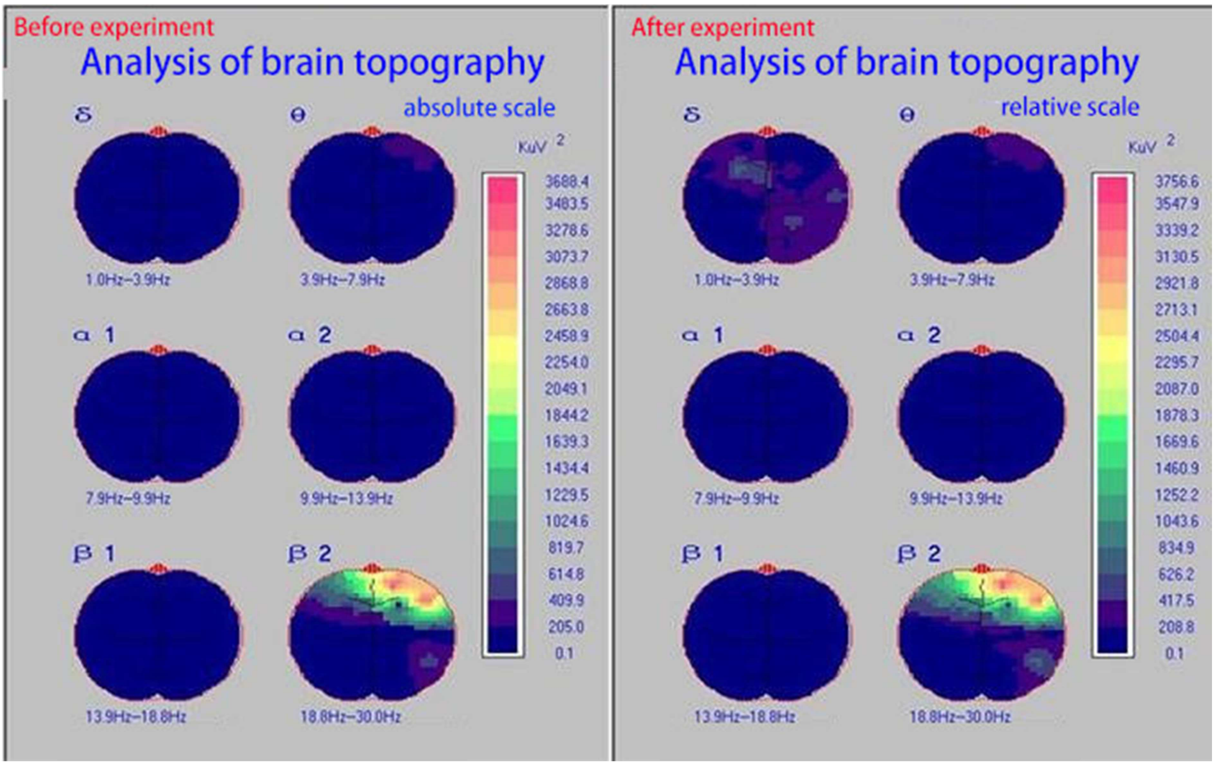

Figure 9. Comparison of absolute EEG power changes before and after the Neiguan point experiment.

As shown in Table 3, it can be known from the absolute power data of 2 groups of 6 different waveforms measured before and after the Neiguan acupoint experiment:

The P values of the two groups of data before and after the δ, β1, and β2 wave experiments were 0.004, 0.041, and 0.004, and $P<0.05$, indicating that the data were significantly different. The P values of the two groups of data before and after the θ, α1, α2 wave experiment were 0.067, 0.096, 0.113, $P>0.05$, and there was no significant difference in the data.

It can be seen from Figure 9 that different brain wave discharge conditions have changed before and after the Qiana Neiguan point experiment. Before and after the δ and β wave experiments, the discharge potential energy capacity was enhanced, and the θ and α wave discharge potential energy remained basically unchanged.

According to the subjective pain gradient table filled in by the subjects after the experiment, combined with the discharge changes in the same area of the brain topographic map before and after the experiment and the changes in the P value value before and after the experiment, it can be determined that acupoint grabbing can disrupt the brain waves of normal people, and accompany the brain waves in the process of brain disturbance. Severe pain and muscle spasms in the body. Therefore, it can be preliminarily concluded that acupoint arrest has an impact on human physiological functions in the sense of combat.

3.1.2. Comparison of EEG Relative Power Before and After the Neiguan Acupoint Arrest Experiment

Table 4. *Comparison of EEG relative power changes before and after the Qiana Neiguan point experiment (n=8).*

Index	δwave	Θwave	α1wave	α2wave	β1wave	β2wave
Before experiment	12.30±15.51	28.31±11.80	4.26±4.93	5.41±5.79	3.20±18.52	46.52±27.75
After experiment	17.44±10.58	17.83±11.674	1.93±12.30	4.82±5.02	3.03±2.01	54.95±18.48
P	0.270	0.104	0.189	0.735	0.801	0.266

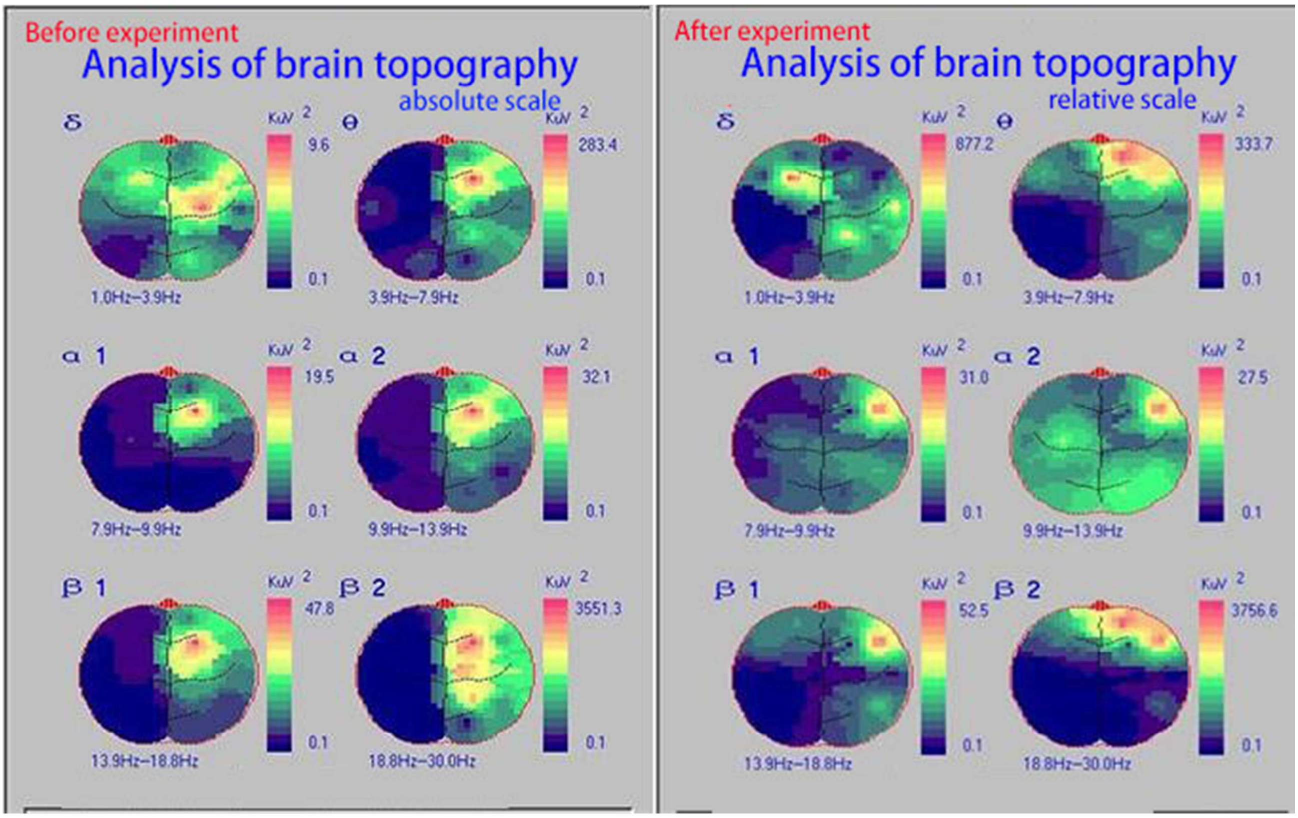

Figure 10. *Comparison of the relative EEG power changes before and after the Neiguan point experiment.*

As shown in Table 4, it can be known from the relative power data of 2 groups of 6 different waveforms measured before and after the Neiguan acupoint experiment: the P values of the two groups of data before and after the δ, θ, α1, α2, β1, β2 wave experiment were 0.270, 0.104, 0.189, 0.735, 0.801, 0.266, $P>0.05$, there was no significant difference between the data;

It can be seen from Figure 10 that the discharges of different waves have changed before and after the experiment. At the same time, the relative ratios of different brain waves in different brain regions have increased or decreased before and after the experiment. This proves that acupoint arrest can cause abnormal brain waves, the waveform of which is similar to epileptic seizures or other phenomena that cause continuous disordered discharge of the brain during muscle spasms.

3.1.3. Comparison of Changes in α-Frequency Band Before and After the Acupoint Arrest Neiguan Acupoint Experiment

Table 5. *Comparison of absolute frequency changes in the α-band before and after the Qiana Neiguan point experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	95.50±53.09	44.93±49.11	48.83±70.06	31.40±25.57	68.61±69.29
After experiment	509.63±809.64	398.43±691.79	262.13±531.00	148.08±338.78	423.53±877.51
P	0.197	0.200	0.274	0.361	0.286

Table 6. *Comparison of relative frequency changes of α-band before and after the Qiana Neiguan point experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	6.55±6.65	5.20±8.00	6.11±6.86	3.69±3.05	6.00±7.57
After experiment	5.15±5.28	6.63±8.27	4.57±6.90	2.56±4.34	3.27±2.79
P	0.666	0.674	0.631	0.585	0.333

Table 7. *Comparison of absolute frequency changes of beta frequency band before and after the Qiana Neiguan point experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	1638.35±1636.85	1687.29±1616.58	854.45±1006.96	611.16±348.39	820.78±735.64
After experiment	6626.74±5449.22	2006.40±1607.88	1326.93±945.99	1216.00±1089.77	3592.93±2478
P	0.572	0.484	0.746	0.324	0.970

Table 8. *Comparison of relative frequency changes of β-band before and after the Qiana Neiguan point experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	58.64±21.71	78.84±16.45	61.41±23.87	62.56±16.29	48.79±26.49
After experiment	57.15±21.49	42.34±23.94	36.64±29.75	32.61±27.12	51.19±25.49
P	0.913	0.002	0.085	0.066	0.884

It can be seen from Tables 5 and 6 that there was no significant difference in the data changes in the five brain regions before and after the α frequency experiment. α frequency mostly occurs in adults who are awake, quiet, and eyes closed. Due to the severe pain caused by the experimental operation, the subjects experience palpitation and high mental tension. The measured p values are all > 0.05, and there is no significant difference in the data.

3.1.4. Comparison of β-Frequency Band Changes Before and After the Acupoint Arrest Neiguan Acupoint Experiment

As shown in Table 7, the absolute frequency data of β waves in 5 different brain regions of the two groups before and after the Qiana Neiguan acupoint experiment showed that the p-values in each region of the β-frequency band were all greater than 0.05, and there was no significant difference in the data.

As shown in Table 8, the relative frequency data of beta waves in 2 groups of 5 different brain regions measured before and after the Ganna Neiguan acupoint experiment showed that the P value of the beta frequency band in the frontal, parietal, occipital and temporal regions was greater than 0.05, and the data was not significant. There was a significant difference in the data.

It can be seen from Tables 7 and 8 that the data changes in the five brain regions before and after the beta frequency experiment were only significantly different in the central region. Due to the severe pain during the experiment and the difference in the subjects' sensitivity to acupoint pain, the measured data are quite different. Therefore, the significant difference between the data before and after the experiment is not obvious.

3.1.5. Comparison of Changes in the Delta Frequency Band Before and After the Acupoint Arrest Neiguan Acupoint Experiment

Table 9. *Comparison of absolute frequency changes in the delta frequency band before and after the Qiana Neiguan point experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	123.84±147.74	46.68±55.63	96.50±91.72	75.86±74.49	196.81±171.99
After experiment	2097.15±2211.47	1194.61±1024.20	944.40±971.22	2222.53±3117.27	3053.99±7149.62
P	0.041	0.017	0.048	0.092	0.299

Table 10. *Comparison of the relative frequency changes in the delta frequency band before and after the Qiana Neiguan point experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	10.29±14.31	6.91±12.61	15.90±14.40	10.15±9.82	15.07±11.20
After experiment	20.42±13.73	25.57±12.66	20.83±19.01	36.56±30.26	18.64±2.12
P	0.209	0.006	0.488	0.055	0.726

Table 11. *Comparison of absolute frequency changes in the θ frequency band before and after the Qiana Neiguan point experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	535.44±42.52	146.21±125.87	146.73±114.88	204.23±136.89	392.46±223.20
After experiment	1271.90±599.57	868.26±776.43	1861.10±1724.29	1140.80±1086.04	1263.96±934.66
P	0.029	0.033	0.028	0.056	0.038

Table 12. *Comparison of the relative frequency changes in the θ frequency band before and after the Qiana Neiguan point experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	24.52±13.80	9.06±4.73	16.57±10.29	23.60±14.31	30.14±17.73
After experiment	17.28±14.25	25.47±23.91	37.96±29.07	28.26±25.10	26.90±23.13
P	0.383	0.072	0.090	0.716	0.755

As shown in Table 9, the absolute frequency data of delta waves in 2 groups of 5 different brain regions measured before and after the Qiana Neiguan acupoint experiment showed that the P values of the delta frequency band in the frontal, central and parietal regions were less than 0.05, and the data were significantly different.; The P value of the occipital and temporal regions of the delta frequency band is greater than 0.05, and there is no significant difference in the data.

As shown in Table 10, the relative frequency data of delta waves in 2 groups of 5 different brain regions measured before and after the experiment on Neiguan acupoint can be seen: the P value of the delta frequency band is greater than 0.05 in the frontal, parietal, occipital and temporal regions, and no data are available. Significant difference; P is less than 0.05 in the central area of the delta frequency band, and the data has a significant difference.

It can be seen from Table 9 and Table 10 that there are many significant differences in the data changes of the five brain regions before and after the delta frequency experiment. δ is a physiological slow wave, which mostly occurs in deep sleep state or pathological coma, and its changes mostly occur in occipital and temporal regions. Therefore, according to the data before and after the experiment, it can be determined that the Neiguan acupoint can cause abnormal delta waves of normal brain waves, and even the continuous disordered discharge of the brain when it is similar to epilepsy or other muscle spasms.

3.1.6. Comparison of Changes in Theta Frequency Band Before and After the Acupoint Arrest Neiguan Acupoint Experiment

As shown in Table 11, the absolute frequency data of theta waves in 2 groups of 5 different brain regions measured before and after the Qiana Neiguan acupoint experiment shows that the P values of the frontal, central, parietal, and temporal regions of the θ frequency band are less than 0.05, and the data are as follows: Significant difference; the P value of the occipital region of theta frequency band is greater than 0.05, and the data has a significant difference.

As shown in Table 12, the relative frequency data of theta waves in 2 groups of 5 different brain regions measured before and after the experiment on Neiguan acupoint can be seen: the P value of the frontal region, central region, parietal region, occipital region and temporal region of the theta frequency band is greater than 0.05, the data showed no significant difference.

It can be seen from Table 11 and Table 12 that there are significant differences in the data changes of the five brain regions before and after the theta frequency experiment. Theta mostly appears in the doze state, and the changes mostly appear in the parietal and temporal regions. Data before and after the experiment.

It can be determined that the Neiguan acupoint can cause abnormal theta waves of normal brain waves, and even the continuous disordered discharge of the brain when it is similar to epileptic seizures or other muscle spasms.

3.1.7. Summary

Before and after the Qiana Neiguan point experiment, different brain wave discharges changed. Before and after the δ and β wave experiments, the discharge potential energy was enhanced, and the θ and α wave discharge potential energy remained basically unchanged. According to the subjective pain gradient table filled in by the subjects after the experiment, Combined with the changes of electrical discharge in the same area of the brain topographic map before and after the experiment and the changes of the P value before and after the experiment, it can be determined that acupoint arrest can disrupt the brain waves of normal people, and the process of brain electrical disturbance is accompanied by severe pain and body muscle spasms. Therefore, it can be preliminarily concluded that acupoint arrest has an impact on human physiological functions in the sense of combat.

3.2. Analysis of the Influence of Acupoints on the Human Brain Waves

3.2.1. Comparison of Absolute EEG Power Before and After the Acupoint Arrest Quchi Acupoint Experiment

According to P value>0.05 (no significant difference) or P value<0.05 (significant difference), the influence of acupoint grabbing experiment on brain waves before and after the experiment was judged, so as to demonstrate the influence of acupoint grabbing on human physiological function.

Table 13. *Comparison of absolute EEG power changes before and after the Qiana Quchi acupoint experiment (n=8).*

Index	δwave	Θwave	α1wave	α2wave	β1wave	β2wave
Before stimulation	210.56±157.83	1116.03±1009.51	118.51±86.37	257.24±232.49	79.71±50.63	3549.88±3268.44
After stimulation	2697.06±1959.71	2494.39±1774.19	602.21±702.58	247.24±166.26	174.44±122.78	7138.19±1872.96
P	0.009	0.069	0.099	0.926	0.097	0.008

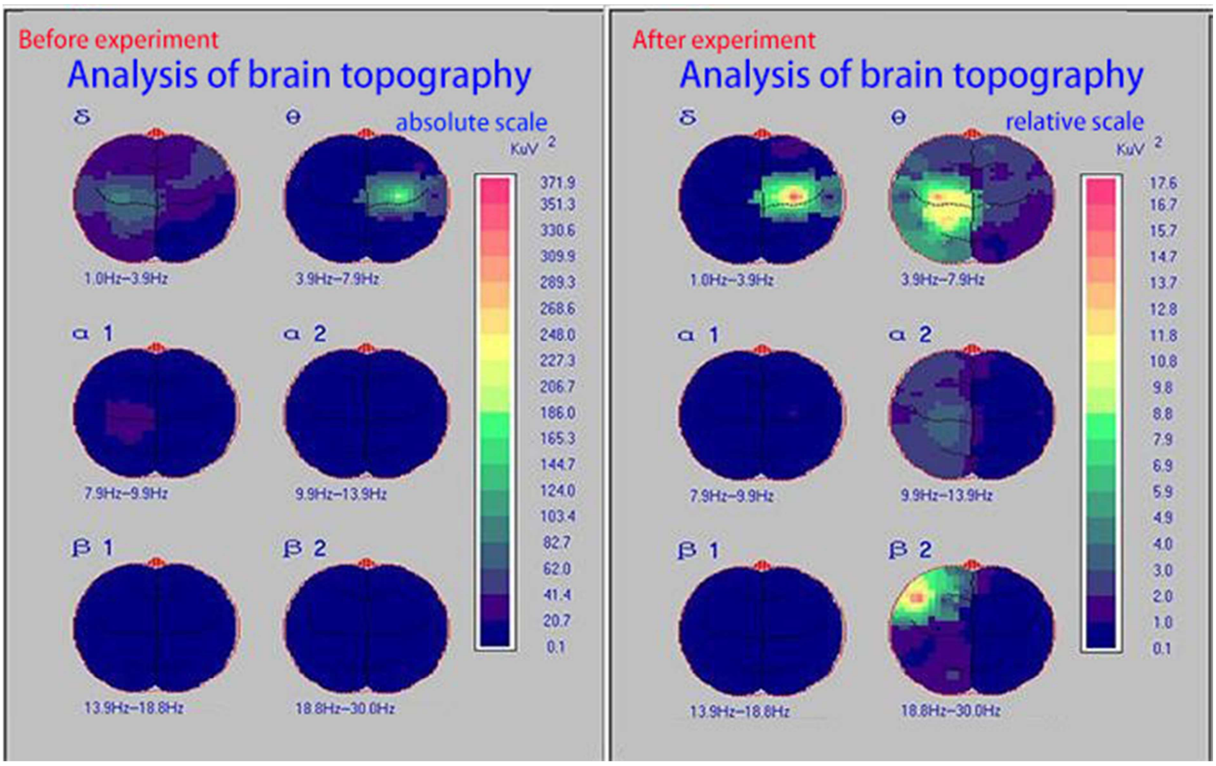

Figure 11. *Comparison of absolute EEG power changes before and after the Qiana Quchi acupoint experiment.*

As shown in Table 13, it can be seen from the absolute power data of 2 groups of 6 different waveforms measured before and after the Qiana Quchi acupoint experiment: the P values of the two groups of data before and after the δ, β2 wave experiment are less than 0.05, and the data are significantly different; θ, α1, α2, β1 wave before and after the experiment, the P value of the two groups of data is greater than 0.05, there is no significant difference between the data.

3.2.2. Comparison of EEG Relative Power Before and After the Acupoint Arrest and Na Quchi Acupoint Experiment

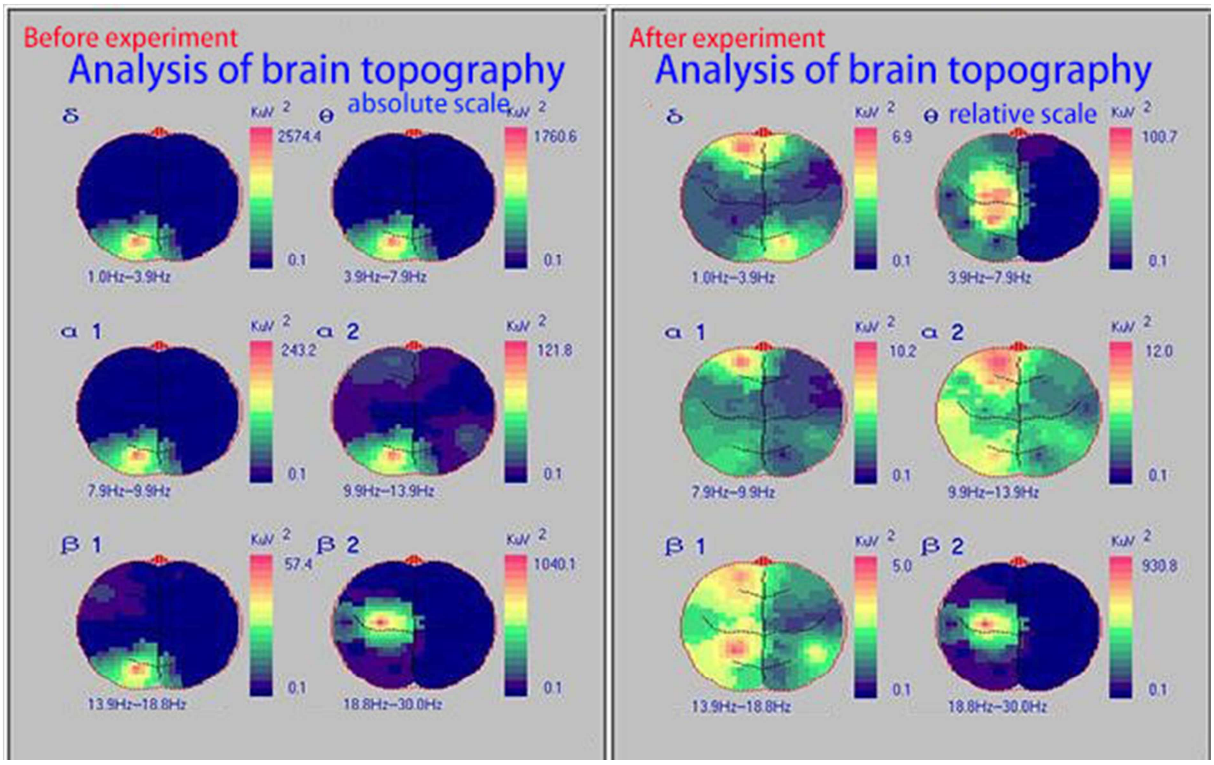

Figure 12. *Comparison of relative EEG power changes before and after the Qiana Quchi acupoint experiment.*

Table 14. *Comparison of EEG relative power changes % before and after the Qiana Quchi acupoint experiment (n=8).*

Index	δ%wave	θ%wave	α1%wave	α2%wave	β1%wave	β2%wave
Before stimulation	11.57±7.80	39.37±18.76	5.65±5.69	8.01±5.04	8.41±5.21	26.98±21.97
After stimulation	2.79±2.40	10.91±7.22	3.12±3.53	2.19±1.88	28.49±15.35	52.49±20.02
P	0.003	0.001	0.104	0.002	0.022	0.002

As shown in Table 14, it can be seen from the absolute power data of 2 groups of 6 different waveforms measured before and after the Qiana Quchi point experiment: the P value of the two groups of data before and after the δ, θ, α2, β1, β2 wave experiment is less than 0.05, and the data has significant There was no significant difference between the two groups before and after the α1 wave experiment, P = 0.104 (P > 0.05).

It can be seen from Figure 12 that the discharges of different waves have changed before and after the experiment, and the relative ratios of different brain waves in different brain regions have increased or decreased before and after the experiment. This proves that acupoint arrest can cause abnormal brain waves, and even a phenomenon similar to epileptic seizures or other continuous disordered discharges in the brain that cause muscle spasms.

3.2.3. Comparison of Changes in α-Frequency Band Before and After the Acupoint Arrest of Quchi Acupoint Experiment

Table 15. *Comparison of absolute frequency changes in the alpha frequency band before and after the Qiana Quchi acupoint experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	49.41±24.41	33.65±34.53	33.96±38.98	41.23±49.41	220.66±492.42
After experiment	724.48±1083. 04	163.03±214.14	341.91±519.58	177.28±280.29	444.23±591.10
P	0.122	0.146	0.121	0.229	0.241

Table 16. *Comparison of the relative frequency changes of the α frequency band before and after the Qiana Quchi acupoint experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	2.95±3.03	10.55±18.94	11.66±19.45	10.01±14.10	12.17±20.55
After experiment	6.01±8.21	4.53±4.13	3.65±4.88	5.19±8.24	7.23±10.58
P	0.256	0.360	0.269	0.404	0.474

As shown in Table 15, the absolute frequency data of α waves in 2 groups of 5 different brain regions measured before and after the experiment at Jiana Quchi point shows that the P values of the α frequency band in frontal, central, parietal, occipital and temporal regions are greater than 0.05, the data showed no significant difference.

As shown in Table 16, according to the relative frequency data of α waves in 2 groups of 5 different brain regions measured before and after the Qiana Quchi acupoint experiment, it can be seen that the α frequency band P values of frontal, central, parietal, occipital and temporal regions are greater than 0.05, the data showed no significant difference.

It can be seen from Table 15 and Table 16 that there was no significant difference in the data changes in the 5 brain regions before and after the alpha wave frequency experiment. The frequency of alpha waves mostly occurs in adults who are awake, quiet, and eyes closed. Due to the severe pain caused by the experimental operation, the subjects experience palpitation and high mental tension. The measured p values are all > 0.05, and there is no significant difference in the data.

3.2.4. Comparison of the β-Frequency Band Changes Before and After the Acupoint Arrest Quchi Acupoint Experiment

Table 17. *Comparison of absolute frequency changes in the beta frequency band before and after the Qiana Quchi acupoint experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	3785.38±3690.83	1193.03±948.37	1425.00±2276.55	701.55±1268.69	1115.54±919.54
After experiment	6117.06±5530.90	1897.04±1734.69	2669.70±2304.55	3564.33±2730.16	4175.75±3601.61
P	0.009	0.258	0.149	0.033	0.019

Table 18. *Comparison of relative frequency changes of β-band before and after the Qiana Quchi acupoint experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	71.69±27.53	72.04±30.26	54.71±41.61	42.31±41.46	61.88±26.27
After experiment	49.82±34.03	52.14±39.52	57.22±37.87	70.72±28.94	59.17±32.80
P	0.092	0.070	0.874	0.112	0.694

As shown in Table 17, the relative frequency data of β waves in 2 groups of 5 different brain regions measured before and after the Qiana Quchi acupoint experiment showed that the P values of the β-band frontal, occipital and temporal regions were less than 0.05, and the data were significantly different; The P value of the central and top regions of the β-band is greater than 0.05, and there is no significant difference in the data.

As shown in Table 18, the relative frequency data of β waves in 2 groups of 5 different brain regions measured before and after the Qiana Quchi acupoint experiment shows that the P values of the β-band frontal, parietal, occipital and temporal regions are greater than 0.05, and no data are available. Significant difference; P is less than 0.05 in the central area of β-band, and there is a significant difference in the data.

It can be seen from Table 17 and Table 18 that there are significant differences in the data changes in the 5 brain regions before and after the beta frequency experiment. Beta waves frequently appear in adult activities, and emotional stress, anxiety and other conditions can lead to a sharp increase in beta wave activity, and most of them appear in the frontal, temporal and central regions. Therefore, through the data before and after the experiment, it can be determined that the Quchi acupoint can cause abnormal β wave of normal brain waves, and even the phenomenon of continuous disordered discharge in the brain when similar to epileptic seizures or other muscle spasms.

3.2.5. Comparison of the Changes in the Delta Frequency Band Before and After the Acupoint Arrest Quchi Acupoint Experiment

Table 19. *Comparison of absolute frequency changes in the delta frequency band before and after the Qiana Quchi acupoint experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	57.01±72.99	13.85±14.19	19.48±29.85	39.31±38.86	43.25±42.79
After experiment	1602.93±1202.26	1235.86±2805.42	2688.90±4671.2	298.06±256.19	1017.76±927.99
P	0.049	0.528	0.221	0.184	0.090

Table 20. *Comparison of the relative frequency changes in the delta frequency band before and after the Qiana Quchi acupoint experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	3.95±5.79	4.32±8.05	7.08±11.86	9.14±10.96	4.00±4.50
After experiment	15.99±10.90	20.32±25.76	21.69±32.90	9.70±10.22	15.88±12.82
P	0.025	0.104	0.226	0.928 0.011	0.011

As shown in Table 19, the absolute frequency data of delta waves in 2 groups of 5 different brain regions measured before and after the Qiana Quchi acupoint experiment can be seen: the P in the frontal region of the delta frequency band is less than 0.05, and the data are significantly different; The P value of the regional, occipital and temporal regions was greater than 0.05, and there was no significant difference in the data.

It can be seen from Table 19 and Table 20 that there are some significant differences in the data changes of the five brain regions before and after the delta frequency experiment. δ is a physiological slow wave, which mostly occurs in deep sleep or pathological coma. Therefore, through the data before and after the experiment, it can be determined that the Qanaquchi acupoint can cause abnormal delta wave of normal brain waves, and even the phenomenon of continuous disordered discharge in the brain when similar to epileptic seizures or other muscle spasms.

3.2.6. Comparison of the Changes in the θ Frequency Band Before and After the Acupoint Arrest Quchi Acupoint Experiment

Table 21. *Comparison of absolute frequency changes in the θ frequency band before and after the Qiana Quchi acupoint experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	407.68±382.30	143.44±113.69	181.35±147.55	190.76±128.37	351.20±271.04
After experiment	3259.60±3227.73	521.60±419.57	932.49±705.55	617.90±557.68	1184.49±1086.97
P	0.051	0.053	0.028	0.089	0.069

Table 22. *Comparison of relative frequency changes of theta frequency band before and after the Qiana Quchi acupoint experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	21.41±25.37	13.09±6.14	26.55±29.83	38.54±32.89	21.95±13.97
After experiment	28.18±22.02	23.01±27.34	17.44±15.63	14.38±14.66	17.72±14.10
P	0.455	0.259	0.154	0.068	0.586

As shown in Table 21, the absolute frequency data of theta waves in 2 groups of 5 different brain regions measured before and after the Qiana Quchi acupoint experiment showed that the P values of the frontal, central, occipital, and temporal regions of the theta frequency band were greater than 0.05, and no data were available. Significant difference; P is less than 0.05 in the top area of the theta frequency band, and the data is significantly different.

3.2.7. Summary

Before and after the experiment, the discharge conditions of different waves changed. The discharge potential of δ, θ, and β waves increased, and the overall discharge potential of α wave remained basically unchanged. According to the subjective pain gradient table filled in by the subjects after the experiment and the measured data, combined with the analysis results of brain topography, it can be preliminarily determined that acupoint arrest has an impact on human physiological functions.

3.3. Analysis of the Influence of Non-Acupoint Arrest on Human Brain Waves

3.3.1. Comparison of Absolute EEG Power Before and After the Non-Acupoint Arrest Experiment

As shown in Table 23, the absolute power data of 6 different waveforms in 2 groups before and after the non-acupoint experiment can be seen: the data P of the two groups before and after the delta wave experiment is less than 0.05, and the data are significantly different; θ, α1, α2, β1 The P value of the two groups of data before and after the β2 wave experiment was greater than 0.05, and there was no significant difference in the data.

It can be seen from Figure 13 that the discharge conditions of different waves have changed before and after the experiment, the discharge potential energy of δ and θ waves is enhanced, and the overall discharge potential energy of α and β waves is basically unchanged.

Table 23. *Comparison of absolute EEG power changes before and after the arrest of non-acupoint experiment (n=8).*

Index	δwave	Θwave	α1wave	α2wave	β1wave	β2wave
Before experiment	7.58±8.72	20.45±11.58	4.56±5.63	9.40±12.36	2.70±3.10	55.31±2713
After experiment	18.36±7.55	18.30±10.35	3.68±3.53	1.69±0.66	1.35±0.80	56.62±15.71
P	0.044	0.596	0.707	0.121	0.261	0.870

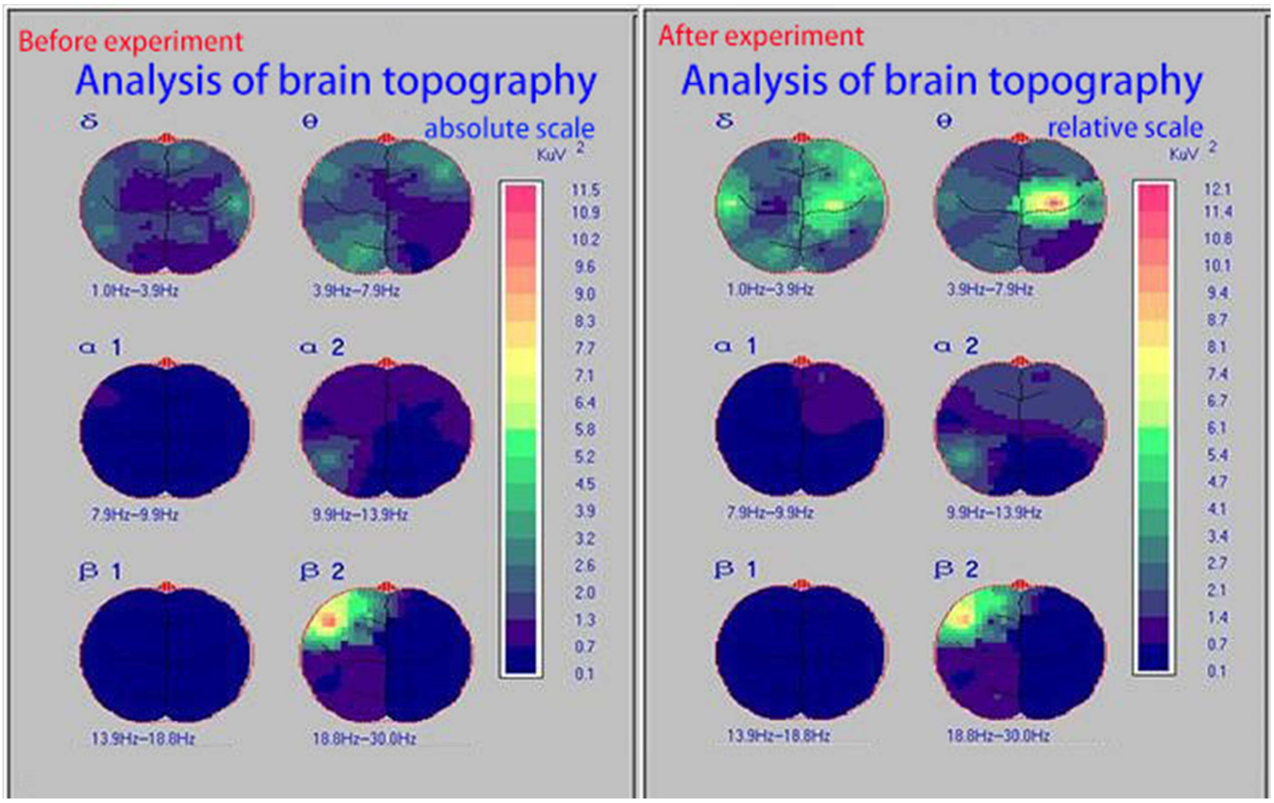

Figure 13. *Comparison table of absolute EEG power changes before and after the non-acupoint experiment.*

3.3.2. Comparison of EEG Relative Power Before and After Non-Acupoint Arrest Experiment

As shown in Table 24, the relative power data of 2 groups of 6 different waveforms measured before and after the non-acupoint experiment can be seen: the P of the two groups of data before and after the delta wave experiment is less than 0.05, and the data are significantly different; θ, α1, α2, β1 The P value of the two groups of data before and after the β2 wave experiment was greater than 0.05, and there was no significant difference in the data.

Table 24. *Comparison of EEG relative power changes before and after the non-acupoint experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	7.58±8.72	20.45±11.58	4.56±5.63	9.40±12.36	2.70±3.10
After experiment	18.36±7.55	18.30±10.35	3.68±3.53	1.69±0.66	1.35±0.80
P	0.044	0.596	0.707	0.121	0.261

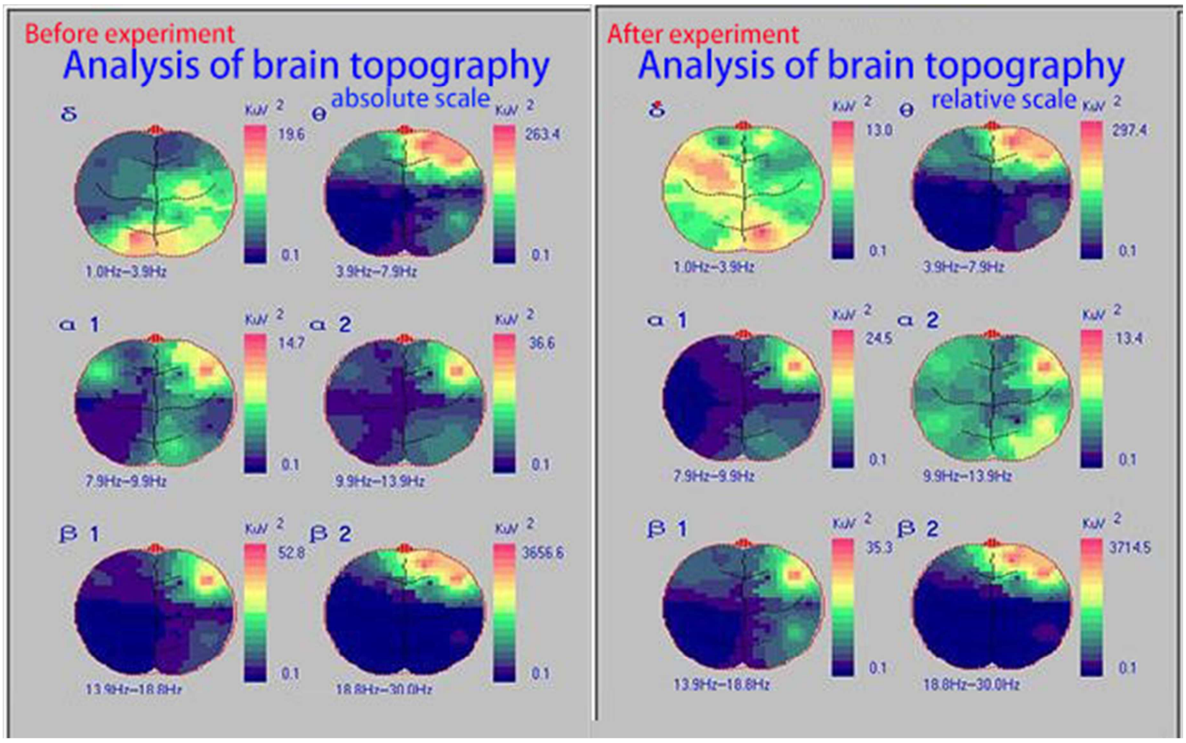

Figure 14. Comparison of EEG relative power changes before and after the non-acupoint experiment.

3.3.3. Comparative Analysis of the Differences in Alpha Wave Changes Before and After Acupoint Arrest and Non-Acupoint Experiments

Table 25. Comparison of absolute frequency changes in the α-band before and after the non-acupoint experiment (n=8).

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	101.53±39.85	130.59±140.46	71.38±97.36	23.24±10.41	141.35±187.15
After experiment	95.64±37.93	110.44±116.98	124.39±195.31	34.81±23.72	195.79±263.68
P	0.621	0.046	0.172	0.097 0.087	0.621

Table 26. % of relative frequency changes of α-band before and after the non-acupoint experiment (n=8).

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	3.55±3.54	7.92±4.56	4.09±6.19	1.62±1.14	12.67±19.18
After experiment	5.58±7.04	4.54±4.22	3.91±7.73	0.88±0.59	6.27±12.47
P	0.266	0.011	0.920	0.136	0.055

Table 27. Comparison of absolute frequency changes of β-band before and after the non-acupoint experiment (n=8).

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	5569.63±6097.04	974.80±1175.00	1958.18±2280.12	1634.70±1378.26	909.57±613.69
After experiment	6757.90±9313.99	3768.90±3466.95	6224.23±7678.70	4228.79±2578.18	5396.76±3371.03
P	0.098	0.091	0.161	0.049	0.028

Table 28. % of relative frequency changes of β-band before and after the non-acupoint experiment (n=8).

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	83.82±14.55	62.73±17.29	65.48±29.03	79.65±09.83	57.21±36.54
After experiment	67.57±30.07	88.20±11.50	72.88±29.37	75.24±18.36	84.65±19.86
P	0.108	0.006	0.516	0.642	0.029

As shown in Table 25, the absolute frequency data of α waves in 2 groups of 5 different brain regions measured before and after the non-acupoint experiment can be seen: the P value of the α frequency band frontal, parietal, occipital and temporal regions is greater than 0.05, and the data is not significant There is a significant difference in the data.

3.3.4. Comparison of β-Wave Changes Before and After Acupoint Arrest and Non-Acupoint Experiments

As shown in Table 27, the absolute frequency data of beta waves in 2 groups of 5 different brain regions measured before and after the non-acupoint experiment can be seen:

The P value of β-band frontal, central and parietal regions was greater than 0.05, and the data had no significant difference; the P value of β-band occipital and temporal regions was less than 0.05, and the data had significant differences.

As shown in Table 28, the relative frequency data of beta waves in 2 groups of 5 different brain regions measured before and after the non-acupoint experiment can be seen: the P value of the beta frequency band in the frontal, parietal, and occipital regions is greater than 0.05, and there is no significant difference in the data; The P value of β-band central area and temporal area is less than 0.05, and the data are significantly different.

It can be seen from Table 27 and Table 28 that there are significant differences in the occipital and temporal regions in the data changes of the 5 brain regions before and after the beta frequency experiment. Beta frequency mostly occurs in adult activities, and emotional stress, anxiety and other conditions can lead to a sharp increase in beta wave activity, and it mostly occurs in the frontal, temporal and central regions. Therefore, through the data before and after the experiment, it can be determined that the non-acupoints can also cause abnormal β-wave of normal brain waves, and even the continuous disordered discharge of the brain when similar to epileptic seizures or other muscle spasms.

3.3.5. Comparison of Delta Wave Changes Before and After the Acupoint Arrest and Non-Acupoint Experiments

Table 29. *Comparison of absolute frequency changes in the delta frequency band before and after the non-acupoint experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	93.18±40.92	117.29±145.88	25.46±17.92	25.46±17.92	34.04±16.14
After experiment	70.71±56.41	77.93±89.11	118.19±199.83	49.19±45.02	58.08±39.20
P	0.098	0.091	0.161	0.049	0.028

Table 30. *The relative frequency change ratio of the delta frequency band before and after the non-acupoint experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	4.12±5.31	5.60±4.46	8.89±15.33	1.78±1.87	2.72±1.83
After experiment	5.75±8.93	2.42±2.30	3.82±7.81	1.38±1.19	1.14±0.85
P	0.351	0.052	0.212	0.485	0.049

Table 31. *Comparison of absolute frequency changes of theta frequency band before and after the non-acupoint experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	344.93±333. 48	278.33±250.85	387.46±225.02	274.55±148.42	341.86±267.72
After experiment	724.90±535. 37	191.80±239.24	773.52±361.73	1680.69±2599.19	385.68±286.44
P	0.114	0.008	0.021	0.180	0.140

Table 32. *Comparison of the relative frequency changes in the θ frequency band before and after the non-acupoint experiment (n=8).*

Index	Frontal region	Central District	Parietal region	Occipital region	Temporal region
Before experiment	85.1±6.54	23.76±18.88	21.53±18.72	16.94±9.00	27.40±26.46
After experiment	21.09±22.34	4.84±6.23	19.39±15.13	22.50±18.69	7.94±7.66
P	0.169	0.036	0.816	0.553	0.063

As shown in Table 29, the absolute frequency data of delta waves in 2 groups of 5 different brain regions measured before and after the non-acupoint experiment can be seen: the P value of the frontal, central and parietal regions of the delta frequency band is greater than 0.05, and there is no significant difference in the data; The P values of the occipital and temporal regions of the delta frequency band were less than 0.05, and the data were significantly different.

3.3.6. Comparison of the Changes in Theta Wave Before and After Acupoint Arrest and Non-Acupoint Experiments

As shown in Table 31, through the comparative analysis before and after the non-acupoint experiment, according to the measured absolute frequency data of the θ frequency band of the five brain regions, it can be known that:

The P values of the frontal, occipital, and temporal regions of the θ band were greater than 0.05, and the data had no significant difference; the P values of the central and parietal regions of the θ band were less than 0.05, and the data had significant differences.

As shown in Table 32, the relative frequency data of the theta frequency bands in the five brain regions of the non-acupoints of the qina group can be seen: the P value of the frontal, parietal, occipital, and temporal regions of the theta frequency band is greater than 0.05, and there is no significant difference in the data; the P value of the central region of the theta frequency band is less than. 05, there is a significant difference in the data.

To sum up, it can be seen that there are significant differences in some brain regions in the data changes of the five brain regions before and after the theta frequency experiment. Theta mostly appears in the doze state, and the changes mostly appear in the parietal and temporal regions. According to the data before and after the experiment, it can be determined that arrest non-acupoint acupoints can also cause abnormal θ waves of normal brain waves, and even a phenomenon similar to epileptic seizures or other continuous disordered brain discharges that cause muscle spasms, but its effect is far worse than that of acupoint arrest.

3.3.7. Summary

Before and after the experiment, the discharge conditions of different waves changed. The discharge potential energy of delta and theta waves was enhanced, and the overall discharge potential energy of alpha and beta waves remained basically unchanged. According to the subjective pain gradient table filled in by the subjects and the measured data after the experiment, combined with the analysis results of the brain topography, the non-acupoints will also produce abnormal brain wave effects similar to those of the acupoints, but the degree of effect is far less than that of the acupoints. of high degree.

3.4. Comparative Research and Analysis of the Acupuncture Points and the Non-Acupoints

3.4.1. Comparison of the Changes Between Jiana Neiguan and Non-Acupoints

As shown in Table 33, the absolute power data of 2 groups of 6 different waveforms measured after the Naiguan and non-acupoint experiments can be seen: the P value of the two groups of data after the delta wave experiment is less than 0.05, and the data are significantly different; θ, α1, α2, β1, β2 wave after the experiment, the P value of the two groups of data is greater than 0.05, the data has no significant difference.

As shown in Table 34, the relative power data of 6 different waveforms in 2 groups after the experiment of capturing Neiguan and non-acupoints can be seen: the P value of the two groups of data after the δ and β1 wave experiment is less than 0.05, and the data is significantly different; θ, α1, α2, β2 waves after the experiment, the P value of the data in the two groups is greater than 0.05, and there is no significant difference between the data.

Table 33. *Comparison of absolute power changes between Jianna Neiguan and non-acupoints (n=8).*

Indicators	Δwave	Θwave	α1wave	α2wave	β1wave	β2wave
Before stimulation	2716.50±1 582.71	3009.74±2435.18	348.84±330.30	1014.25±1316.33	533.09±462.48	8981.53±5043.67
After stimulation	374.09±242.39	1720.08±1314.78	350.16±334.83	299.18±205.36	4591.41±3370.88	7423.38±2323.08
T	0.138	0.182	0.783	0.002	0.002	0.35
P	0.004	0.215	0.994	0.171	0.171	0.446

Table 34. *Comparison of the relative power changes of the Neiguan acupoint and non-acupoints in Jianna (n=8).*

Indicators	δwave	Θwave	α1wave	α2wave	β1wave	β2wave
Before stimulation	12.30±15.51	28.31±11.80	4.26±4.93	5.41±5.79	3.20±1.85	46.52±27.75
After stimulation	3.62±2.40	10.91±7.22	3.12±3.53	2.19±1.88	28.00±15.00	52.00±20.00
T	0.013	0.297	0.002	0.006	0.000	0.744
P	0.005	0.176	0.393	0.200	0.002	0.802

It can be seen from Table 33 and Table 34 that there are significant differences in the delta wave and β wave data. Both the acupoints and non-acupoints have effects on the arrest, and both can have a certain impact on the EEG, but through the experimental values before and after each The magnitude of change and the subjective pain perception table of the subjects after the test can confirm that the effect of acupoint grabbing is much greater than the effect of non-acupoint grabbing.

3.4.2. Comparison of Changes Between Jiana Quchi and Non-Acupoints

The independent samples t-test was used to process the data obtained from the test of Ganna Neiguan and Qiana non-acupoints, and to observe the changes of absolute and relative power values of 6 EEG waveforms between acupoints and non-acupoints after the test.

Table 35. *Comparison of absolute power changes between Jianna Quchi and non-acupoints (n=8).*

Indicators	Δwave	Θwave	α1wave	α2wave	β1wave	β2wave
Before stimulation	2697.06±1959.71	2494.39±1774.19	602.2125±702.58	247.2375±166.26	174.4375±122.78	7138.1875±1872.96
After stimulation	374.09±242.39	1720.08±1314.78	350.16±334.83	299.18±205.36	4591.41±3370.88	7423.38±2323.08
T	0.004	0.368	0.011	0.259	0.000	0.783
P	0.012	0.338	0.381	0.587	0.008	0.791

Table 36. *Comparison of the relative power changes of the Qiana Quchi acupoint and the non-acupoints % (n=8).*

Indicators	δwave	Θwave	α1wave	α2wave	β1wave	β2wave
Before stimulation	18.36±7.55	18.30±10.34	3.68±3.53	1.69±0.66	1.00±1.00	57.00±16.00
After stimulation	3.62±2.40	10.91±7.22	3.12±3.53	2.19±1.88	28.00±15.00	52.00±20.00
T	0.040	0.227	0.595	0.145	0.000	0.752
P	0.001	0.142	0.513	0.255	0.002	0.584

As shown in Table 35, the absolute power data of 2 groups of 6 different waveforms measured after the experiment of Qanaquchi and non-acupoints shows that the P value of the two groups of data after the delta and β1 wave experiments is less than 0.05, and the data are significantly different; θ, α1, α2, β2 waves after the experiment, the P value of the data in the two groups is greater than 0.05, and there is no significant difference between the data.

As shown in Table 36, the relative power data of 2 groups of 6 different waveforms measured after the experiment of the Quchi acupoint and the non-acupoint can be seen: the P value of the two groups of data after the δ and β1 wave experiment is less than 0.05, and the data is significantly different; θ, α1, α2, β2 wave after the experiment, the P value of the two groups of data is greater than 0.05, the data has no significant difference.

It can be seen from Table 35 and Table 36 that there are significant differences in the data of delta wave and β wave. Both the acupoints and non-acupoints are effective for the arrest, and both can have a certain impact on the EEG, but through the experimental values before and after each The magnitude of change and the subjective pain perception table of the subjects after the test can confirm that the effect of acupoint grabbing is much greater than the effect of non-acupoint grabbing.

3.5. Discussion and Analysis

3.5.1. Discussion

In this paper, the changes of the EEG waveform of the Qiaona acupoints are converted into data through the experimental method. The experimental results confirmed that acupoint trapping can induce abnormality of normal brain waves, and the waveform of this abnormal state is similar to that of epilepsy [12]. The cause of epilepsy is that the abnormal hypersynchronized paroxysmal discharge of neurons in the brain can lead to epileptic seizures. These abnormal brain electrical activities can be recorded by EEG, the analysis of epilepsy symptoms, and the use of EEG to observe different brains [13-15]. Electrical waveform, by observing the correlation between the characteristics of the waveform and the epileptic seizure, several characteristics of the EEG waveform during the epileptic seizure can be obtained, such as spike wave, sharp wave, spike wave, sharp-slow complex wave, spike-slow complex wave, etc. The electrical activity is also known as epileptiform discharges. The pathology of epilepsy is that the discharge of conduction channels in the brain can spread to adjacent or distant brain regions, and return to the discharge region again through the nerve conduction channels of nerve excitation in the brain. Epileptiform discharges are the pathological and physiological basis of epileptic seizures, and their characteristic waveforms are highly valued by current medical clinical and related scientific research fields.

In the study of epilepsy brainwave waveforms, the formation and mechanism of each epileptic waveform were analyzed: spike waves (Figure 15) and sharp waves (Figure 16) are similar, and the formation mechanism is the same, both of which are formed in excitatory postsynaptic potentials, caused by rapid hypersynchronous depolarization of a group of neurons, reflecting abnormally increased neuronal excitability. Spike wave: The time limit is 20~70ms, the amplitude is more than 100μV, and the waveform is sharp and easy to distinguish. Spikes are the most basic paroxysmal brain electrical activity. Rapid hypersynchronized firing between neurons underlies the pathology and physiology of spikes. Spikes generally occur during localized epilepsy or grand mal seizures. The two waveforms of spine and apex are the main waveforms during epilepsy symptoms, which mainly reflect the synchronization degree of neuron group discharge.

Figure 15. *Spike wave.*

Figure 16. *Sharp wave.*

Spike-slow complex: a slow wave after a spike, the spike component sometimes falls on the ascending branch of the previous slow wave or the descending branch of the following slow wave component.

Figure 17. *Ratchet wave.*

Figure 18. *Sharp slow wave.*

Polyspike-slow complex: A characteristic waveform that is followed by a slow wave after more than one consecutive spike is called a polyspike-slow complex. Polyspike-slow complexes are often seen in myoclonic epilepsy and sometimes in other types of epilepsy. The amplitude and intensity of myoclonic twitches are often related to the number and amplitude of spikes. Typically, 2 to 10 spikes precede the slow wave (Figure 19).

Figure 19. *Multi spike slow wave.*

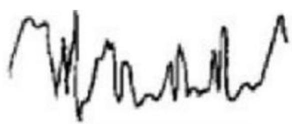

Figure 20. *Hypsarrhythmia.*

The waveforms measured in this paper are very similar to the polyspike-slow complex and high rhythm-disordered waveforms, as shown in Figure 21, Figure 22, Figure 23. Figures 21 and 22 are consistent with the characteristics of multiple spike-slow complex waves followed by more than one continuous spike wave followed by a slow wave; Figures 23 is consistent with highly dysrhythmic waves, which are characterized by various asymmetric, asynchronous sharp waves, spikes Involvement of multiple spikes mixed in persistent diffuse irregular high-amplitude slow waves.

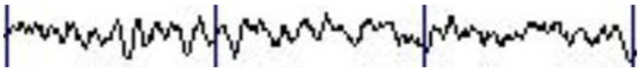

Figure 21. *Waveform after Neiguan point experiment.*

Figure 22. *Waveform after Quchi point experiment.*

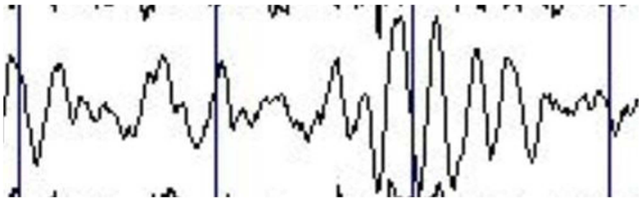

Figure 23. *Brain waves after the experiment.*

3.5.2. Analysis

In this paper, Neiguan and Quchi acupoints were selected as the main research objects. Through experimental design, the Neiguan and Quchi acupoints were stimulated by grasping and grasping. After the test, subjective descriptions were comprehensively analyzed. According to the comparative study of the data obtained before and after the experiment, the basic EEG alpha waves, beta waves, theta waves, and delta waves all changed before and after the experiment. The graphs of relative and absolute power showed that the number of delta waves and beta waves increased significantly before and after the experiment, and the dispersion range in the whole brain area also expanded after the experiment. Existing studies have shown that when the delta wave is dominated by high-amplitude slow waves in the whole brain, it is the most common brain electrical circle in coma. During the process, the brain electrical circle phenomenon appeared in each subject, and through the subjective experience interview of the subjects after the experiment, it was known that during the stimulation process, the stimulated arm muscles had a feeling of spasm and difficulty in breathing. Combined with the data obtained from the previous experiments and the subjective feelings of the subjects, it can be preliminarily verified that acupoint arrest has a certain destructive effect on the normal physiological functions of the human body.

4. Conclusions and Recommendations

4.1. Conclusion

1) Acupoint grabbing will affect the brain waves, which will cause the body to spasm.
2) Through the Comparative study with the brain wave waveform of the body's epilepsy caused by the disease, the brain wave generated after acupoint arrest is different from the waveform produced by epilepsy lesions, and it is concluded that the physiological changes of the body after acupoint arrest are similar to the pathology of epilepsy.
3) By observing the rhythm changes of different waveforms of α, β, θ, and δ of the same subject before and after the experiment after grasping acupoints and non-acupoints, it is concluded that the acupoints have a greater degree of abnormality in human brain waves.
4) During the experiment, subjects' subjective pain thresholds for acupoint stimulation were significantly different. Therefore, in the future, the promotion and use of acupoint grabbing should be combined with other techniques.
5) The sample size of this experiment is small, the accuracy of the instruments and equipment is not high, and the subjects are too nervous during the experiment, resulting in some abnormal data, but this does not affect the use of acupoint arrest as an advanced fighting method in the future.

4.2. Recommendations

1) The research of the thesis involves a comparative study with the epileptic seizure waveform, and more microscopic physiological research is needed on the acupoint arrest experiment and epilepsy, which also provides support for further research in this thesis.
2) Individuals have different subjective pain thresholds for acupoint stimulation, and acupoint grasping requires special hand shapes and techniques, and there is no corresponding force measuring instrument that can be replaced. All subjects were pressed with maximum force. Most subjects would feel extremely unbearable pain during the test, but very few subjects did not feel much pain due to individual differences. For some combat effects, it is necessary to practice the basic actions of grappling, so as to prepare for timely remedy after the failure of acupoint grappling.
3) While learning acupoint arrest, you should learn more about Yixue and Chinese medicine. Acupoints are the intersection of body qi and blood. Only by understanding and mastering the corresponding knowledge of Chinese medicine and Yixue can you experience the best combat effect.

Appendix

"Subjective Pain Gradient Scale”

According to the 12-level list of pain levels in medicine, the pain that humans can feel is divided into 12 levels. The higher the level (number), the greater the pain. After the experimental stimulation was performed on the subjects, the subjects were allowed to choose according to their subjective feelings.

The subjective pain gradient is as follows:

1) Inconspicuous pain, such as mosquito bites.
2) Pain that has just been noticed, such as preparation for surgery after anesthesia.
3) Very weak pain, scratched by a knife.
4) Weak pain, such as being slapped in the face.

5) Mild pain, such as hitting a door, or being pinched by a door.
6) Moderate pain, such as gastroenteritis and stomach pain caused by unclean diet.
7) Strong pain, such as being beaten with a stick.
8) Severe pain, such as painful restlessness.
9) Very strong pain, such as neck, shoulder, waist and leg pain, neuralgia.
10) Severe pain, such as a severed finger.
11) Extremely severe pain, such as appendicitis pain and other visceral pain.
12) Unbearable pain, such as life is worse than death.

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