

CASE REPORT

Scalp Acupuncture Treatment Protocol for Anxiety Disorders: A Case Report

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ABSTRACT

Anxiety disorders are among the most common psychiatric illnesses, and acupuncture treatment is widely accepted in the clinic without the side effects seen from various medications. We designed a scalp acupuncture treatment protocol by locating two new stimulation areas. The area one is between Yintang (M-HN-3) and Shangxing (DU-23) and Shenting (DU-24), and the area two is between Taiyang (M-HN-9) and Tianchong (GB-9) and Shuaigu (GB-8). By stimulating these two areas with high-frequency continuous electric waves, remarkable immediate and long-term effects for anxiety disorders have been observed in our practice. The first case was a 70-year-old male with general anxiety disorder (GAD) and panic attacks at night. The scalp acupuncture treatment protocol was applied with electric stimulation for 45 minutes once every week. After four sessions of acupuncture treatments, the patient reported that he did not have panic attacks at night and he had no feelings of anxiety during the day. Follow-up 4 weeks later confirmed that he did not have any episodes of panic attacks and he had no anxiety during the day since his last acupuncture treatment. The second case was a 35-year-old male who was diagnosed with posttraumatic stress disorder (PTSD) with a history of providing frontline trauma care as a Combat Medics from the Iraq combat field. He also had 21 broken bones and multiple concussions from his time in the battlefield. He had symptoms of severe anxiety, insomnia, nightmares with flashbacks, irritability, and bad temper. He also had chest pain, back pain, and joint pain due to injuries. The above treatment protocol was performed with 30 minutes of electric stimulation each time in combination with body acupuncture for pain management. After weekly acupuncture treatment for the first two visits, the patient reported that he felt less anxious and that his sleep was getting better with fewer nightmares. After six sessions of acupuncture treatments, the patient completely recovered from PTSD, went back to work, and now lives a healthy and happy family life. The above cases and clinical observation show that the scalp acupuncture treatment protocol with electric stimulation has a significant clinic outcome for GAD, panic disorder and PTSD. The possible mechanism of action of scalp acupuncture on anxiety disorder may be related to overlapping modulatory effects on the cortical structures (orbitofrontal cortex [OFC]) and medial prefrontal cortex [mPFC]) and subcortical/limbic regions (amygdala and hippocampus), and biochemical effect of acupuncture through immunohistochemistry (norepinephrine, serotonin) performed directly to the brain tissue for anxiety disorders.

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Key Words

Anxiety disorders, scalp acupuncture, electric stimulation

Disclosures

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INTRODUCTION

Anxiety occurs when an individual is frightened but the source of the danger is not known, not recognized, or inadequate to account for the symptoms. Anxiety disorders are a group of mental disorders with excessive feelings of anxiety and fear.¹ The somatic symptoms of anxiety (similar to fear) are shakiness and sweating, palpitations (subjective experience of tachycardia), tingling in the extremities and numbness around the mouth, dizziness and syncope (fainting), mydriasis (pupil dilation), and gastrointestinal and urinary disturbances (eg, diarrhea and urinary frequency).

Anxiety disorders are the most common mental disorders in Americans. Approximately 40 million American adults aged 18 years and older, or about 18.1% people in this age group have anxiety disorders in a given year.²

Anxiety disorders include general anxiety disorder (GAD), panic disorder (PD), obsessive-compulsive disorder (OCD), specific phobia, social phobias (social anxiety disorder), and posttraumatic stress disorder (PTSD). The approximate prevalence of specific anxiety

disorders in US adults are GAD: 5% to 6%; panic disorder: 3.5%; OCD 2% to 3%; specific phobia: 12.5%; social phobia: 12%; PTSD 5% to 6% in males, 10% to 14% in females.²

Animal studies have identified a network of brain regions that subserve behaviors related to fear and anxiety. These specific brain structures in the lower limbic regions include the amygdala and hippocampus, which play significant roles in most anxiety disorders.

The amygdala (nuclei within the medial temporal lobe), the key brain structure in the acquisition and expression of fear-related behaviors, can alert the rest of the brain that a threat is present and trigger a fear or anxiety response. The emotional memories stored in the amygdala may play a role in anxiety disorder involving very distinct fears.³

The hippocampus encodes threatening events into memories, which appears to be smaller and play a role in the flashbacks, deficits in explicit memory, and fragmented memories of the traumatic event that are common in PTSD.⁴

The higher prefrontal regions, including the orbi-

to frontal cortex (OFC) and medial prefrontal cortex (mPFC) send dense inhibitory projections to the lower limbic regions including the amygdala and hippocampus in order to modulate the neural activity of fear and anxiety.³

Specific neurochemical systems are implicated in anxiety related disorders. The neurotransmitters involved in the development of anxiety include increased activity of norepinephrine (NE) and dopamine and decreased activity of gamma-aminobutyric acid (GABA) and 5-HT (serotonin).⁵

Figure 1 shows the locations of the brain regions of amygdala, hippocampus, OFC, and mPFC, which may help readers to understand how to locate the stimulation areas on the scalp for our scalp acupuncture treatment protocol for anxiety disorders.

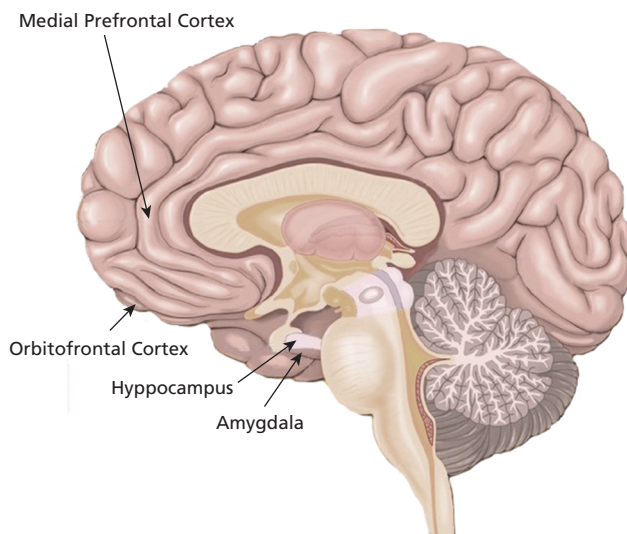


Figure 1 Locations of the brain regions of amygdala, hippocampus, orbitofrontal cortex, and medial prefrontal cortex.

Most cases of anxiety disorder do not have an identified specific causal factor; they may result from a combination of genetic, environmental, psychological, and developmental factors. Risk factors include exposure to extreme stress or threat, early life events of physical, sexual, and emotional trauma, physical and psychological stress, and genetic or other biological factors. Conventional intervention for anxiety disorders include pharmacotherapy and cognitive behavioral therapy (CBT). Benzodiazepines, alprazolam (Xanax), buspirone, beta blockers, selective serotonin reuptake inhibitors (SSRIs), and antidepressants are commonly used medications for anxiety. Common side effects include risks of tolerance, dependence, abuse, and withdrawal symptoms (benzodiazepines, alprazolam); dizziness, headache, somnolence, nervousness (buspirone); fatigue, dizziness (beta blockers); and restlessness, sedation, weight gain (SSRIs).⁶ Medications are only indicated if other measures have not been found to be effective or a person is not interested in trying them.⁷

The use of complementary and alternative medicine (CAM) in the Western world has increased during the past decade.⁸ Some reports suggest that those individuals with psychiatric conditions are more likely to use CAM than those without a psychiatric medical history.⁹ CAM treatments for anxiety disorders include interventions such as acupuncture, naturopathy, and homeopathy and self-help techniques including tai chi and meditation. Complementary medicines include herbal medicine and nutritional products. The use of acupuncture for psychiatric patients is on the rise in the United States and it is considered a safe and effective treatment modality.¹⁰ Acupuncture has been widely applied in the treatment of anxiety disorders and statistically significant effects have been observed.¹¹ The treatment methods include body acupuncture and ear acupuncture, with the common selected points of Baihui (DU-20), Shenmen (HE-7), Neiguan (P-6), and Sanyinjiao (SP-6), which is based on traditional Chinese Medicine (TCM) theory of Zang-Fu organs.¹² Based on the integration of TCM with biomedical knowledge of brain regions related to anxiety disorders, we designed and located two new stimulation areas on the scalp with electric stimulation, and this treatment protocol for anxiety disorders has shown remarkable immediate and long-term effect in our clinical practice.

TREATMENT PROTOCOL OF SCALP ACUPUNCTURE WITH ELECTRIC STIMULATION

1. Stimulation area one: The line between Yintang (M-HN-3) and Shangxing (DU-23) and Shenting (DU-24)

The above points are commonly used classic acupuncture points for the treatment of anxiety, palpitations, and the like. The treatment method is that one acupuncture needle inserts from Yintang (M-HN-3) toward Shenting (DU-24) and Shangxing (DU-23), and another needle inserts from Shenting (DU-24) penetrating Shangxing (DU-23) toward Yintang (M-HN-3). These two needles are then attached to electric wires with high-frequency continuous electric pulse delivered from an electric device. The small electric current is passed between the pair of needles to stimulate the higher prefrontal regions, including the OFC and mPFC to regulate the neural activity of fear and anxiety.

2. Stimulation area two: The line between Taiyang (M-HN-9) and Tianchong (GB-9) and Shuaigu (GB-8).

The above points are commonly used classic acupuncture points for the treatment of mental disorders. The treatment method is that one acupuncture needle inserts from Taiyang (M-HN-9) toward Shuaigu (GB-8) and Tianchong (GB-9), and another needle inserts from Tianchong (GB-9) penetrating Shuaigu (GB-8) toward Taiyang (M-HN-9). These two needles are then attached to the electric wires through which a high-frequency continuous electric pulse is delivered from the electric

device. The small electric current is passed between the pair of needles to stimulate the amygdala and hippocampus regions to regulate the neural activity of fear and anxiety. For the locations of selected points in the treatment protocol, see Figure 2.

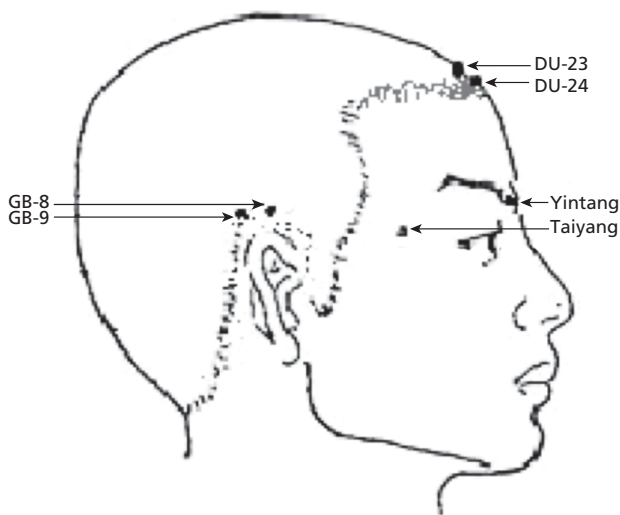


Figure 2 Locations of selected points.

Generally, this treatment protocol of scalp acupuncture is performed by selecting gauge #34 in diameter and 1 to 1.5 cun in length needles. The needles are inserted obliquely (30 degree angle) into the subgaleal layer of the scalp for 0.5 to 1 cun (depending on the patient's sensitivity). After rotating the needles with needling sensation (De Qi), the two groups of needles are connected to the electric wires for electric stimulation with high-frequency continuous waves/pulse for 30 to 45 minutes (depending on the patient's tolerance). The treatment is given once or twice per week for 6 weeks as one course of treatment, and then the effectiveness is evaluated after every 12 visits to determine the medical necessity for the second and third course of treatments.

CASE ONE

A 70-year-old male patient presented with a chief complaint of anxiety and panic attack. For the last 2 months, almost every night he had awakened around midnight with a sudden onset of rapid heartbeat, palpitations, chest tightness, shortness of breath, and light headedness. This problem interfered with his sleep and alertness. He was tired and anxious and had a jittery feeling in the abdomen. He had a history of similar panic attacks and GAD 15 years ago, for which he took paroxetine (Paxil) for several years. His son has similar symptoms of anxiety. The patient had been taking multivitamins and calcium and fish oil supplements for the last several weeks and avoiding triggers such as caffeine and chocolate; he also tried meditation and focused on enjoyable activities without improvement. He had told his neighbor (one of our patients) that he

did not want to take Paxil again because to fear of adverse effects. His neighbor suggested he try acupuncture treatment.

Physical examination revealed good physical health. His bloodwork and electrocardiogram (ECG) findings were normal. His tongue was pale red with a thin white coating, and the pulse was slightly thready and wiry.

Treatment and Outcome

The treatment protocol described previously was applied. The treatment plan was scalp acupuncture with electric stimulation for 45 minutes once every week until improvement of the symptoms was observed.

In the first visit, after 45 minutes of electric stimulation and after the needles were removed, the patient said that he had a brief nap during the treatment and woke up feeling relaxed, peaceful, and calm.

One week later, the patient had a second visit, and he mentioned that his nighttime panic attacks had been reduced by half, and sometimes he still had feelings of anxiety during the day. The same treatment was applied with 45 minutes of electric stimulation.

On the third visit, the patient reported that he only had occasional panic attacks at night, and sometimes he had anxious feelings in social circumstances. The treatment plan was adjusted to acupuncture treatment once every other week based on the symptom improvement and his financial situation.

Two weeks later, the patient came back for a fourth visit, and he reported that he did not have panic attacks at night after his last acupuncture treatment, and he had no anxiety during the day. He said that he almost cancelled this appointment but he decided to come just to make sure that he did not make any mistake to affect the treatment.

A follow-up phone call 4 weeks later confirmed that he did not have any panic attacks since his last session of acupuncture treatment. He is enjoying his retirement without any mental health issues.

CASE TWO

A 35-year-old male was brought to our clinic by his father-in-law with a chief complaint of anxiety and back pain. The patient was a Combat Medic who had returned from Iraq in 2010. He was married with two children and was living a happy life without any physical and mental health issues before he went to the Iraq war. One year ago, he started to develop anxiety as a result of his experience providing frontline trauma care for the wounded soldiers on the battlefield. He also had 21 broken bones and multiple concussions that were caused in the battlefield. When he returned from Iraq, he was diagnosed with PTSD with symptoms of severe anxiety, insomnia and nightmares with flashbacks, irritability, and bad temper. He also had chest, back, hip, and shoulder pain as well as muscle pain due to injuries. He had fatigue, had lost weight, and was experiencing nausea. He was unable to function in his daily life. He

refused to take medication for his pain and PTSD, and his explanation was that he wanted to avoid dependence on medications for the rest of his life.

Physical examination showed considerable distress and anxiety. He had clear breath sounds and normal S1/S2, and his abdomen was soft without tenderness. There were many tender trigger spots distributed along the spine and muscle areas of his back and shoulder, hip, and other joints, with limited range of motion. His tongue was pale and purple, and his pulse was wiry and rapid.

Treatment and Outcome

The treatment protocol described previously was applied in combination with body acupuncture for the management of pain. With the patient in the supine position, after finishing the body acupuncture points and Ashi points, needling manipulation with the needles retained for the treatment of pain in the front of the body, scalp acupuncture was performed with 30 minutes of electric stimulation. Then, after all the needles were removed, the patient was turned into prone position for acupuncture by needling Huatuojiayi (M-BW-35) points and Ashi points with the needles retained for another 15 minutes for the treatment of pain in the back of the body. The treatment plan was to perform acupuncture with the described treatment protocol once every week for 6 sessions and then evaluate the effectiveness.

After weekly acupuncture treatment for the first two visits, the patient reported that he felt less anxious and that his sleep was improved and he was having fewer nightmares. He had more energy and less pain and enjoyed playing with his children.

One month later, after four sessions of acupuncture treatments, the patient mentioned that his sleep was much better and he was only occasionally having nightmares. He still felt anxious when he went out, so he tried to avoid social situations. His pain was also much better, and he was able to do some yard work at home.

This patient received weekly acupuncture treatments for six visits. In September 2013, he visited the clinic again with the complaint of lower back pain for 2 weeks due to sprains from his injury history. In response to an inquiry about his medical history, he reported that he has completely recovered from PTSD without physical pain after acupuncture treatments. He went back to work, has a healthy and happy family life, and he was recently promoted to be a State Department director.

DISCUSSION

Acupuncture is commonly used and well accepted in the clinic for the treatment of anxiety disorders. It remains an effective treatment for those suffering from anxiety without the side effects seen with various drugs. The literature review revealed that most acupuncture treatments were based on TCM theory of Zang-fu organs by selecting points on the body such as

Baihui (DU-20), Neiguan (P-6), Shenmen (HT-7), Tiachong (LIV-3), Sanyinjiao (SP-6), Zusanli (ST-36), etc, and ear acupuncture with Shenmen, Tranquilizer, and Relaxation points.¹³ Our treatment protocol corrects the imbalance and dysfunction of the brain regions in anxiety disorder by selecting points on the Governing Vessel and local acupoints on the head. Based on the theory of scalp acupuncture, in combination with new medical findings on the organic basis and neurobiology in the brain regions for anxiety disorders, we have developed these two new scalp acupuncture stimulation areas between Yintang (M-HN-3) and Shenting (DU-24) and Shangxing (DU-23), and between Taiyang (M-HN-9) and Shuaigu (GB-8) and Tianchong (GB-9). Instead of traditional high-frequency needling manipulation by hand, we enhance the effect of the acupuncture needling stimulation by adding high-frequency continuous electric current, which has shown significant improvement in effectiveness in our clinic practice. According to TCM theory and ancient classic acupuncture literature, Taiyang (M-HN-9) and Yintang (M-HN-3) points have the function of quieting the spirit and clearing the mind; Shenting (DU-24) and Shangxing (DU-23) act to anchor and settle anxiety and calm the spirit with the indications of anxiety, palpitations, and fright; Shuaigu (GB-8) and Tianchong (GB-9) function to quiet the spirit and stabilize the mind and are indicated for mental disorders.¹⁴

Scientific research has found that acupuncture increases a number of central nervous system neurohormones and neurotransmitters (adrenocorticotrophic hormone, beta-endorphins, serotonin, and noradrenaline) and urinary levels of 3-methoxy-4-hydroxyphenylglycol (MHPG)-sulfate, an adrenergic metabolite inversely related to the severity of illness in schizophrenics.¹⁵ There is growing evidence showing significant biochemical effects of acupuncture through immunohistochemistry performed directly to the brain tissue for anxiety disorders, including expression of neuropeptide Y in the basolateral amygdala.^{16,17} Acupuncture accelerates the synthesis and release of serotonin and norepinephrine in the central nervous system; this could possibly explain acupuncture's effect in reducing anxiety and depression symptoms by mimicking the mechanism of various anti-anxiety and anti-depressive medications by increasing amounts of serotonin and norepinephrine available to postsynaptic cells in the brain.¹⁰

In recent years, modern neuroimaging techniques, such as PET, fMRI, EEG, and MEG, have been used in the research of acupuncture mechanisms of action in the human brain.¹⁰ These neuroimaging data strongly suggest that acupuncture at specific acupuncture points has significant overlapping modulatory effects on the cortical structures (eg, orbitofrontal cortex, prefrontal cortex, and medial temporal lobe), and subcortical/limbic regions (eg, hypothalamus, amygdala, cingulate, hippocampus), which may support the effect of acupuncture on anxiety disorders by modulating those

brain regions as well as the effect of acupuncture on PTSD by affecting arousal and motivational states within the nervous system.¹⁸

There are many different acupuncture modalities for the treatment of anxiety disorders. Our clinical observation shows that scalp acupuncture treatment protocol with electric stimulation has a more significant clinical outcome for GAD, PD, and PTSD. Regarding the electric stimulation, the high-frequency continuous waves/pulses need to be used to produce a sedating effect. The stimulating intensity needs to be adjusted to an appropriate level until the patient has a comfortable feeling of vibration just before he or she feels the pain.¹⁹ The stimulation time needs to be about 30 to 45 minutes in each session, depending on the patient's tolerance and conformability. Regular body acupuncture treatment can be combined to treat other symptoms (eg, pain, insomnia, fatigue) by selecting the points based on TCM syndrome differentiation to enhance therapeutic effect. This treatment protocol can also be applied for the treatment of mood disorders, such as depression and bi-polar disorder.

CONCLUSION

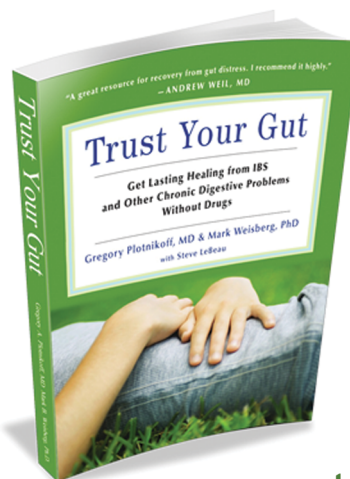
Conventional intervention with pharmacotherapies has limitations and various side effects and often are only indicated if other measures have not been found to be effective or a person is not interested in trying them. CAM for anxiety disorders is a safe and effective treatment modality. Acupuncture is a common practice in the clinic for the treatment of anxiety disorders, and scientific data have demonstrated its statistically significant effectiveness. The unique aspect of our scalp acupuncture treatment protocol is in selecting points on the Governing Vessel and local points on the head to locate the two scalp stimulation areas with electric stimulation in order to regulate and balance the function of the corresponding brain regions related to anxiety disorders. The demonstration of remarkable immediate and long-term effects of this treatment protocol reveals new and developing prospects of scalp acupuncture for the treatment of anxiety disorders. It also encourages further study on a large scale and fundamental research on the mechanism(s) of action on the brain regions using modern research techniques.

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