

Using Chinese scalp acupuncture in the treatment of brain disorders

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### **Abstract**

Acupuncture is an integral component of Traditional Chinese Medicine (TCM), which has been adopted by appropriately trained practitioners for the successful management of brain-based pathologies.

Brain-based disorders are associated with impaired cerebral fuel delivery and complex intracellular and intercellular communication systems. These pathologies result in insufferable human disabilities as well as burdening all economies.

Allopathic protocols dominate claims of new therapeutic breakthroughs for virtually all public health concerns. Now, Chinese scalp acupuncture is proving to be a safe, effective, science-based treatment system providing relief of symptoms and improving function in people experiencing advanced nervous system dysfunction.

### **Introduction**

Chinese culture has included the art of acupuncture in the treatment of various mental illnesses. The treatment of brain-based pathologies is often challenging since finding an effective and economical method is difficult. Recently, studies have focused on understanding the therapeutic background of this technique in treating such disorders such as Alzheimer's, Autism, depression, Parkinson's, schizophrenia, stroke, and traumatic brain injury (TBI). In the treatment of these maladies, scalp acupuncture is considered as an effective method. Traditionally, acupuncture needles are inserted at an angle of 15-30 degrees at different acupoint centers in the scalp at a depth of 10mm (Zhao & Ma 2018). During the insertion, the acupuncturist should ensure that the needles lie in between the loose connective areolar tissues and the aponeurosis (Asakawa, 2013). Scalp acupuncture treatment concentrates on mapped treatment zones on the scalp that are associated with controlling different brain and body parts. During the treatment

process, the needles may be subjected to varying types of rapid stimulations such as twirling and electro-stimulation (Zhao et al. 2015). In the treatment of depression, studies by (Gu W et al. 2014) show that acupuncture exerts some effect on the levels of Noradrenaline and dopamine in the brain. This effect is similar to the action of antidepressants used in the treatment of mental illness. Therefore, this research paper focuses on the use of acupuncture in the treatment of various brain-based pathologies.

### **History of Acupuncture**

According to medical records, acupuncture can be dated to as early as 5 BC in the treatment of various illnesses in Asian countries. In the mid-20th century, the association of multiple ailments with different brain centers created interest in the use of acupuncture in the management of neurological diseases (Wong et al. 2011). This interest has led to the development of effective protocols to improve treatment procedures. Knowledge of reflexology and neurology of the brain has resulted in increased use of scalp acupuncture in the management of brain diseases. There are different types of acupuncture like electroacupuncture, manual acupuncture, and laser acupuncture, which often produces outstanding clinical outcomes. Some of the advantages of scalp acupuncture are that it is less painful when compared to body acupuncture like dry-needling. Also, patients are not required to lie statically during the treatment and can perform therapeutic activities during the process.

The procedure for traditional head acupuncture involves using disposable needles in standard sizes placed at an angle between 15 and 30 degrees in different regions of the scalp. To ensure treatment effectiveness, the needles are inserted approximately 10mm deep into the scalp. At this depth, the patient will experience less pain and discomfort compared to when needles are placed shallow or deep. Rapid stimulation of the needles is sometimes done several times for up

to one hour before they are removed. According to TCM, acupuncture points in the body may be needed in combination with scalp regions for an enhanced therapeutic response. Some of the points in the head that are used in the treatment of neurological conditions include the lateral line and midline of the forehead, lines in the upper surface of the head, and Bai Hui (GV 20) (Zhuicheng, Yaochi, & Nianhong 2011).

The Sishencong region includes four acupoints located in and around Bai Hui. Although Sishencong is not among the ordinary meridians in the scalp, stimulation of these points is responsible for creating calmness and generating excitement moods in a person. According to TCM, pointing the needles in a different direction in the scalp causes the development of various therapeutic effects in the body (Cui, 2014). Acupuncture therapy is known to enhance the harmony between the yin and the yang. Scalp acupuncture works by evoking positive changes in both structural and body functioning. Through the autonomic nervous system, acupuncture acts to regulate various physiological systems such as heart rate and blood pressure in the body. Acupuncture also modulates complex signaling in deep brain centers, which can result in the restoration of normal EEG waveforms in depressed patients.

Some of the regions in the brain that are affected during acupuncture procedures include the temporal lobes, the amygdala, hippocampus, and the cortex (Zhao et al. 2015). People with brain disorders often have altered levels of catecholamines compared to those found in healthy people. With the use of scalp acupuncture, a surge in hormones in the central nervous system is experienced. Some of the hormones whose levels are altered with the use of scalp acupuncture include beta-endorphins, serotonin, and GABA proteins (Lee et al. 2018). Apart from hormones, there are other molecules important in the mental functioning that are altered, and these include nitric oxide synthase as well as brain-derived neurotrophic factors.

### **Treatment of Parkinson's Using Scalp Acupuncture**

Parkinson's affects the neurons in the midbrain. Dopamine levels reduce as a result leading to inhibition of information transmission from the brain to other parts of the body. The approach of using acupuncture for this pathology seeks to ensure that adequate cerebral fuel delivery is maintained for tissue survivability. In evaluating the effectiveness of scalp acupuncture on treating Parkinson's, a contemporary technique was used. Scalp acupuncture techniques use needles that penetrate corresponding skin areas of the head for an expected therapeutic benefit. Needle sites are based upon classical acupuncture theory, brain neurophysiology, and the clinical experience of the practitioner. In a span of three to seven years, some patients recovered their normal motor skills and were said to feel better as the result of the therapy. According to the Preferred Reporting Items for Systematic reviews and Meta-Analysis, the quality assessment threshold of the therapy shows promising, but not convincing results (Chen et al. 2019).

Various databases were searched including, EMBASE, AMED, PubMed, and Chinese Medical Database to compile previous works on the effectiveness of scalp acupuncture in treating Parkinson's.

*Method:* Twenty-five patients who have verum, and twenty- five patients acting as controls. The length of the study is six weeks.

*Criteria:* Patients included in this study had Parkinson's for at least one year. They were between the ages of fourteen and thirty years and were able to walk, keep appointments, and fill out questionnaires.

*Excluded:* Patients who were bedridden, using herbal remedies, or had been treated with acupuncture four weeks before this experiment.

*Materials:* Acupuncture needles and standardized questionnaires.

*Procedure:* The verum group gets ten acupuncture needles in two sessions once a week. The patients are required to complete PDG39 forms before and after acupuncture treatments. During every acupuncture session, a UPDRS interview is given using sections (a) and (b). There is a twenty-five-minute break between the sessions, and afterward, the needles are removed. The second UPDRS interview is given to the patients four days after the acupuncture sessions. The control group only fills out the PDQ39 questionnaire.

*Results:* The assumption is that this protocol is the initial treatment for patients with Parkinson's disease. The primary purpose of the study is to evaluate the effectiveness of scalp acupuncture in treating patients with Parkinson's as opposed to traditional western medicine. Scalp acupuncture is more comfortable, attends to patient's needs, and elicited better results (Lee H. et al. 2013).

### **Treatment of Depression Using Scalp Acupuncture**

Depression is associated with pathophysiological alterations of stress hormones and changes in the levels of neurotransmitters such, as dopamine and serotonin. Acupuncture is useful in the treatment of many conditions, such as depression and other psychiatric disorders like anxiety. Depression affects a large section of the population. According to (Zhuicheng, Yaochi, & Nianhong 2011), over 121 million people suffer from depression, making depression significant in terms of the global disease burden. Psychiatric conditions such as depression are challenging to treat because there is a high percentage of care plan noncompliance in patients when drugs and psychotherapy are used to manage their symptoms. Instances of noncompliance are often attributed to the adverse side effects and the high cost associated with psychiatric medication. These factors often cause patients to seek non-allopathic methods of management,

such as acupuncture. Depression is associated with alteration of stress hormones and changes in the levels of neurotransmitters such as dopamine and serotonin.

During the treatment process using scalp acupuncture, multiple protocols are used in depression patients. Depression can be treated using a cumulative dose, which comprises the total number of treatments with various changes in treatment frequency. Another method involves the use of neurophysiological dosing consisting of a change in the number of needles used in the procedures and the type of stimulations used in the treatment process. Studies by (Zhuicheng, Yaochi, & Nianhong 2011) show that changing the acupuncture dosage results in changes in the outcomes. Although there are often amazing positive outcomes in the treatment of depression, there are no definitive statistics to show the effects of acupuncture in the treatment of patients with depression are always ideal. However, the number and frequency of acupuncture procedures performed on the patients have a beneficial impact on increasing the levels of neurotransmitters in the body. The use of scalp acupuncture results in the neurotransmitters returning to normal homeostatic levels and reducing the symptoms of depression in patients.

According to TCM, depression is caused by stagnation in the liver Qi, resulting in the mental disruption of patients. In TCM, some points of treatment for depression are Yin-Tang, LIV-3, and Bai Hui in the scalp. However, LU-7 and KI-6 points are also crucial in the treatment of depression because they improve the sleeping patterns of patients. A study by (Zhao et al. 2015) found that the use of electroacupuncture was effective in similarly reducing the symptoms of depression to fluoxetine, which is used in the management of the mental disorder. To achieve a reduction of depression symptoms, patients underwent six weeks of acupuncture treatment while the control group received the standard daily dose of fluoxetine, which is the generic form of the drug Prozac. After six weeks, the levels of GDNF neurotrophic factor had returned to their

normal levels. Also, the rate at which the symptoms reduced was faster in the acupuncture patients compared to the control group using medication. There were a higher number of patients in the acupuncture treatment cohort who showed a positive outcome compared to those patients in the control group. Therefore, the use of acupuncture in the treatment of depression must be promising since the intervention using drugs and psychotherapy is both expensive and has multiple side effects.

### **Treatment of Schizophrenia**

Schizophrenia is a chronic disorder that affects about 0.5 percent of the population. The disease causes patients to experience cognitive defects and sleeping disorders. Pharmacotherapy is often the preferred method for intervening to reduce the incidences of the disorder (Van den Noort et al. 2018). However, as with many other mental disorders, medications and noncompliance are often high. According to (Zhao & Ma 2018), 47% of the patients with schizophrenia were found to be non-compliant in taking the prescribed medication. This noncompliance issue has resulted in the adoption of alternative non-pharmaceutical treatments in the management of schizophrenia. Acupuncture is one of the newly accepted techniques adopted in western medication for the treatment of mental disorders. A study by (Bosch et al. 2015) showed that the use of acupuncture positively impacted symptoms of schizophrenia in five patients that were under their survey. A study by (Zhao & Ma 2018) also showed that combination therapy of acupuncture treatment and small doses of antipsychotic drugs provided the same results as the use of a full dose of antipsychotic medications. However, when the combination therapy was used as the intervention, fewer side effects associated with the drugs were observed. Therefore, the combination therapy of both acupuncture and few drugs is suitable to enable an increase in the number of patients who are compliant with schizophrenia



medication. Another study by (Bosch et al. 2015) showed that scalp acupuncture was able to treat patients with florid schizophrenia symptoms. Acupuncture is also used in the treatment of accompanying symptoms of schizophrenia, such as memory loss. According to (Bosch et al. 2015), there was a positive memory performance in patients who underwent twelve weeks of treatment using acupuncture.

Patients who have schizophrenia are also affected by sleep disorders. However, treatment using acupuncture was beneficial since the patients showed improvement in different sleep variables. A study by (Zhao & Ma 2018) using a randomized controlled trial found that patients with schizophrenia accompanied by sleeping disorder exhibited similar results to those patients who used eszopiclone to manage their sleeping disorders. Therefore in the management of schizophrenia, acupuncture treatment should be administered as an additional treatment since the patients showed positive improvement when the method is used in combination with drug therapy in the management of the mental condition.

Another factor that necessitates the use of acupuncture in the management of schizophrenia is that a majority of patients did not perceive the needles differently in their hallucinations. The hallucinating effect of schizophrenia may make the patients have delusional thoughts about needles, which may increase positive thoughts. However, from the studies by (Asakawa, 2013), it is evident that patients with cognitive symptoms of schizophrenia do not benefit from the treatment using scalp acupuncture. However, the therapy may be used in the treatment of sleeping disorders that are associated with a mental disorder. Some of the sleeping variables that had shown improvement when acupuncture was used in include mean wake up activity, reduction of wake episodes, sleep onset latency, and the average number of wake episodes (Asakawa, 2013). Therefore more trials are required to investigate the effect of

acupuncture treatment in the management of cognitive symptoms. Currently, there are a limited number of studies in the management of schizophrenia using scalp acupuncture. Future research should focus on using longer treatment plans with schizophrenia patients.

### **The use of acupuncture in the management of Alzheimer's disease**

Alzheimer's disease (AD) is one of the significant forms of dementia that is often diagnosed among the elderly population. Some of the main symptoms of the disease include the deterioration of mental functioning. At the initial stages, the disease begins with subtle cognitive decline, but as the illness progresses, the neural damage worsens, resulting in mental disorientation and memory loss. Other symptoms observed with the disease include cases of dysphagia, anterograde amnesia, mood lability, and anxiety. Adverse effects of the condition are that patients forget normal activities such as dressing-up, poor communication, and may develop a predilection for pneumonia.

According to (Zhou et al. 2015), acupuncture is successful in the treatment of Alzheimer's disease compared to the use of drug therapy.

Research by Gu W et al. (2014) examined the efficacy of acupuncture and the drug donepezil in the treatment of Alzheimer's disease. Acupuncture had better results in terms of improvement of symptoms compared to the use of drug therapy. In addition, there were no adverse side effects among the patients treated using acupuncture compared to those treated using donepezil drug therapy. Acupuncture helps the patients by protecting the neurons from deterioration. Acupuncture therapy increases the growth of axons in the neurons and also regulates glucose metabolism (Cui, 2014). This regulation of intake helps in the protection of the neurons by developing a brief hyper-glycolytic state in the neuron system. Acupuncture in AD patients increases brain activity in the cognitive related areas such as the supramarginal gyrus,

cerebellum, and inferior frontal gyrus (Cui, 2014). Studies show that acupuncture is effective in providing therapeutic effects such as decreasing the deposition of A $\beta$  proteins and preventing the phosphorylation of tau protein. These activities increase the transmission of neural activities and reducing the oxidative stress in the same system (Zhou et al. 2015). The therapeutic function of acupuncture depends on the accurate selection of potential acupoints. According to (Gu W et al. 2014), acupoint specificity is necessary for exerting a therapeutic role in a patient.

Different acupoints bring about different brain responses. According to TCM, modification of the DU meridian is essential in the management of dementia. Acupuncture helps in the regulation of the Qi in this meridian. This effect results in uplifting the spirit and clearing the mind of the patients. In animal studies, acupuncture was found to increase the synaptic transmission in the hippocampus (Zhou et al. 2015). This increase in neuronal activity reduces neuroinflammation, which helps in preventing apoptosis of the neurons and mitochondrial damage. When electroacupuncture is introduced at GV 20, patients may improve learning memory with an increase in glucose metabolism that helps in preventing neural damage. After monitoring the regional hemodynamics through MRI studies, there was found a similarity between the neighboring voxels in terms of increased fuel delivery activities. This pattern of physiology results in an improved minimum mental state examination showing that there was better cognitive functioning after acupuncture therapy. Although the drugs are somewhat effective in the management of Alzheimer's, there are more side effects such as stomach upsets, low appetite, and nausea associated with the drugs.

### **Autism**

According to the data provided by (Lee et al. 2018), 1 in every 150 children has autism. Although the disease has no definite cure, there are numerous ways in which the

symptoms of the pathology can be improved. The use of complementary medicine in the treatment of autism in China and Hong Kong has shown some positive results. According to (Zhihui & Jianqiang 2018) the use of scalp acupuncture has helped in the improved behavioral functioning of the children. Children with autism spectrum disorder (ASD) also exhibit elevated emotional deregulation compared to healthy children. However, studies by (Wong et al. 2011) indicated the use of scalp acupuncture helped in reducing the incidences of deregulation. Some of the habits displayed by autistic children that indicate emotional deregulation include increased aggression, injuries afflicted on self, tantrums, and anxiety disorder.

Intervention using scalp acupuncture helps in reducing the incidences of these emotional habits in children. There are high chances that children with autism are also affected by sleep disorders. Also, there is a positive relationship between sleeping disorders and poor cognitive functioning in people with autism (Lee et al. 2018). The symptoms of autism are improved when people who have autism develop good sleeping patterns. Since acupuncture has been shown to help in treating people with sleeping disorders, by using the therapy on ASD patients, the symptoms of the disease will be reduced. A study by (Zhihui & Jianqiang 2018) showed that after thirty sessions of acupuncture therapy, patients with autism experienced an improvement in some of the symptoms related to autism. Some of the areas that were improved with the use of scalp acupuncture included their verbal communication and social problems, such as connecting with other people, and these results were highly significant in children. Studies by (Lee et al. 2018) demonstrate that there was a decreased improvement in verbal and social communication among autistic children as they grew. This finding probably means that young children with autism are more responsive to acupuncture compared to older age groups.

People with autism have an altered level of catecholamines in the blood within their brains. Therefore, the use of scalp acupuncture helps in modulating the levels of these substances in the brain. This effect on catecholamines also helps in regulating the defective brain waves hence enabling children to improve in their symptoms. The underdevelopment of the inferior portion of the prefrontal lobe and the presence of hypoperfusion are often observed in children with autism. These defects result in impaired language abilities, poor cognitive development, and the inability of the children to communicate effectively (Zhihui & Jianqiang 2018). The use of scalp acupuncture helps in improving the perfusion that is low in children with autism, and this will have an effect of improving the cognitive functioning and the communication ability of the children. When intervention is made at an early stage, the ability to grow in the symptoms of ASD is higher because the brain of the children is still developing. However, symptoms such as language and cognitive development can improve through the intervention because children have a long period of maturation.

### **Traumatic Brain Injury**

Traumatic brain injury (TBI) is one of the health problems that result in multiple disabilities as well as death. According to the World Health Organization, over fifty million people suffer from TBI every year in the world. TBI is an economic burden because the mortality rate of the condition ranges between twelve and twenty percent depending on countries (Wong et al. 2011). The rehabilitative process for TBI is extremely complex and leaves the patients entirely dependent on their families for supportive care. The cost of treating TBI is prohibitively expensive, which forces many patients to seek alternative forms of treatment that are more cost-effective. According to studies by (Naeser, & Hamblin 2011), acupuncture is efficacious when applied in the management of traumatic injuries. Acupuncture acts in one way

by stimulating nerves, which send messages to the spinal cord and the brain to activate endogenous opioid receptors. A series of responses follow, which include the changes in the level of hormones such as adrenocorticotrophic hormones and spinal fluids. These chemical changes result in the activation of various pathways in the body, reinforcing innate self- healing.

### **Treatment of Stroke**

Scalp acupuncture is often applied in the rehabilitation of neurological impairments that are observed in stroke patients. The region of focus that has the highest efficacy in the management of stroke sequellae includes the precentral gyrus. Although scalp acupuncture has been effective in the rehabilitation process of patients with stroke, the major limitation for most of the studies is making an evaluation based on systems available to modern medicine (Wang, Xie, & Zheng, 2014). This element makes an accurate evaluation of the curative effect of acupuncture arduous. Studies by (You et al. 2017) demonstrate that a potent scalp acupuncture protocol for patients with stroke involves an eight-week treatment program that is followed by another eight weeks follow up process. The study also found that people recover better from a stroke when the scalp and body acupuncture are combined. Some of the dysfunctions associated with stroke include facial palsy, speech, walking difficulty, and gazing (You et al. 2017). When stroke disorder dysfunction and inflammation makers are monitored at the beginning, middle, and end of the care plan, there is commonly a significant improvement among the people treated using scalp acupuncture.

### **Conclusion**

Chinese scalp acupuncture methodologies are practiced today alongside traditional western medicine. Many patients seek non-allopathic alternatives when pharmacology fails. Most studies, including those experiments with various construct deficiencies, have

demonstrated acupuncture to be a safe and promising therapeutic option for Alzheimer's, Autism, depression, Parkinson's, schizophrenia, stroke, and TBI.

In this paper, the effects of Chinese Scalp Acupuncture in the management of neurodevelopmental and neurodegenerative disorders were analyzed. Scientists may argue that non-allopathic methods of treatment for devastating neurological conditions are meritless, but with the many proven benefits from acupuncture, healthcare paradigms are evolving.

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