

The Science of Auricular Microsystem Acupuncture: Amygdala Function in Psychiatric, Neuromusculoskeletal, and Functional Disorders

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ABSTRACT

Addressing dysfunction of the amygdala via the auricular acupuncture microsystem has vast potential. Widespread medical consequences of amygdala dysregulation have been well-defined scientifically. Clinical results and a significant quantity of existing amygdala research support the rationale for addressing amygdala function through auricular-acupuncture techniques. Further scientific inquiry into their mechanisms of action, clinical applications, and expansion of both professional and public education of the merits of these techniques is warranted.

Keywords: amygdala, auricular therapy, auricular amygdala acupuncture

INTRODUCTION

THE AMYGDALA is a small almond-shaped structure within the temporal lobe of the brain, adjacent to the hippocampus. The left and right hemispheres of the amygdala are crucial to emotional responses, including anxiety, fear, and anger. It appears that the amygdala creates emotional meaning to our memories, and amygdala dysregulation is well-known to be associated with psychiatric disorders. However, the amygdala has significance far beyond that realm; a preponderance of published proof exists regarding the effect of various stimuli on the amygdala, as well as its functions and relevance to numerous medical conditions. Thus, evaluation and treatment of the amygdala via the auricular microsystem have the potential to serve as useful adjuncts to medications, surgeries, and psychotherapy. This microsystem offers the opportunity for acupuncture practitioners—regardless of philosophy, technique, or training—to enhance and complement existing protocols by treating auricular amygdala energetic projections.

Background

The term *medical* acupuncture reflects the cogently considered and comprehensive combination of conventional

Western medicine and ancient Chinese principles and practices. French-originated auricular therapy differs significantly from Traditional Chinese Medicine (TCM)-based acupuncture. Such ear acupuncture is not based upon the classical TCM meridian network and its terminologies. Modern auricular microsystem acupuncture is far less of a hybrid of Eastern and Western medical philosophies than TCM-originated whole-body medical acupuncture. Yet, auricular microsystem acupuncture is an approach that fits the *Western* medical model more closely. This kind of acupuncture's anatomical and embryologic derivations, neurophysiologic mechanisms, and clinical results justify its role as a complementary—and, in some cases, a primary—approach to addressing numerous medical maladies.

Energetic Blockages

Detection and treatment of energetic blockages has long been a critical aspect of successful acupuncture treatment, especially for chronic problems intractable to Western medical intervention. Paul Nogier, MD, discovered several specific energetic blockages unknown to TCM. These manifest as electrically active points on the skin of the auricle within somatotopic projection zones of the affected structures. Various brain structures have long been known to

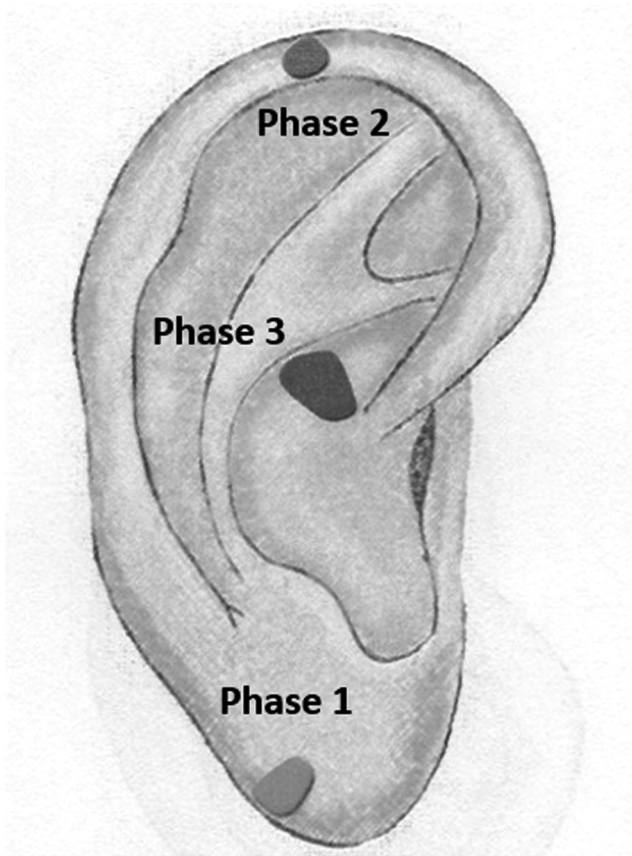


FIG. 1. Amygdala auricular projections. Image used with permission from Nader Soliman, MD, *Atlas of Auricular Therapy*.¹

proponents of auricular therapy to be prone to energetic blockages. Auricular acupuncture points that exist due to energetic blockage are entities beyond those that are basic reflexive manifestations of energetic and/or physical disturbances within corresponding anatomical structures. It appears that such blockages, if left untreated, will diminish the effectiveness of virtually any medical treatment and/or wellness-promoting intervention, including acupuncture itself.

More recently, the amygdala has been identified as a brain structure that might manifest energetic blockages. An electrically active auricular point for the amygdala can exist reflecting an energetic blockage and/or a basic electrically active auricular point associated with a disturbance.¹ Comprehensive treatment is accomplished by seeking and treating electrically active acupuncture points within the borders of all three embryologically based phase zones. The amygdala Phase 1 projection zone exists along the free border of the ear lobule. In Phase 2, the amygdala projects to the undersurface of the helix. In Phase 3, the projection site lies on the upper concha, including the upper part of the Zero Zone (T4–T7 radii), extending upward and posteriorly to the antihelix. Numerous established auricular-acupuncture protocols that have proven effective as complementary and alternative approaches for addressing various symptoms and

conditions include stimulation of a point within the Zero Zone.^{2,3} One may infer that the consistency of results is likely due, in part, to treating the amygdala through the reflex mechanism of the auricular-therapy microsystem.

ADDICTION TREATMENTS

For many decades, various auricular-therapy techniques have produced impressive results in support of patients quitting smoking, as well as overcoming other addictions. According to Stuyt and Voyles, auricular therapy has been implemented extensively in hospitals, and prisons worldwide despite limited published research evidence of its effectiveness.⁴ These researchers referenced Hong Kong neurosurgeon Wen's 1972 discovery: Needles inserted on the ear intended for preoperative anesthesia resulted in diminished withdrawal symptoms from opium. In 1973, Wen and Cheng published their successful findings when using ear and body acupuncture to treat 40 patients who had heroin and opium addictions.⁵ In 1975, Omura et al. published an article on using electroacupuncture for addressing drug-addiction withdrawal.⁶ The National Acupuncture Detoxification Association protocol was established as an auricular-acupuncture support for patients with substance abuse and behavioral health disorders.⁴

At the Liebell clinic, treating amygdala auricular projections can be an effective complement to established auricular-acupuncture protocols for treating addiction. Semipermanent ear acupuncture needles are inserted on a case-specific basis, as indicated by the presence of electrical activity in any or all 3 amygdala projection zones. This action is supported by Shen et al.'s findings that, in addition to the orbitofrontal cortex, the amygdala plays a critical role in the brain circuitry associated with tobacco addiction.⁷

Pain Management

The auricular-acupuncture microsystem approach is organ- and tissue-specific. Therefore, any known pathophysiologic mechanisms will be open to investigation for electrical activity in any auricular-projection zones correlating with pain-associated anatomical structures. Chronic pain and chronic stress are concomitant human experiences. It is understood that the limbic system plays a major role in integrating stress signals involved with chronic pain of both musculoskeletal and psychologic natures. This is one of the reasons memory problems are a frequently experienced phenomenon by patients who suffer from chronic pain. In general, pain itself is a distraction against one's mental focus. Auricular-acupuncture treatment for any projections of limbic-system structures is an appropriate consideration.

Neuroscientific research has shown the hippocampus–amygdala relationship to be quite significant. Bass and

Manns found that memory of certain objects could be enhanced through electrical stimulation to the amygdala.⁸ Disturbances in the hippocampus and amygdala are reflected by auricular dermal projections that are electrically detectable on the auricle.

Acupuncture for pain relief has been long-established worldwide. However, less attention seems to be given to the amygdala's role in visceral and neuromusculoskeletal disorders; yet, a strong body of data does exist. Functional magnetic resonance imaging (fMRI) studies involving needling and electrical stimulation of auricular-amygdala projections could provide greater insights. The ease of access and safety of stimulating the brain via the auricular microsystem could lead to an abundance of medical breakthroughs. Practitioners and patients who have already experienced the benefits of treating auricular-projection acupuncture points of the amygdala in clinical practice can attest to the necessity for expanding public and professional awareness of its far-reaching effects. In clinical practice, electrical activity is frequently detected within one or more amygdala-auricular phase zones. Treatment using electrical stimulation and/or semipermanent needles consistently produces positive patient feedback, in terms of the technique's effectiveness for pain management. This could be alone or in conjunction with physical treatments and other complementary therapeutic modalities.

Migraine Headaches

A 2017 study by Chen et al. reported the association between amygdala functional connectivity dysfunction and the development of migraines.⁹ Additionally, Wanasuntronwong et al.'s 2017 study on the effect of analgesic medication on rats produced significant data regarding amygdala involvement. The researchers investigated headaches related to medication overuse and determined that analgesics could not only provoke chronic headaches but also anxiety and depression.¹⁰ This research implicated pathogenesis involving the effects of chronic usage of the medications on the amygdala.¹⁰ Data derived from this and other research, as well as the positive experiences of patients and practitioners, validates further study of auricular-amygdala acupuncture for patients who suffer from migraines and other headaches.¹¹

Lower-Back Pain

During the 1950s, Dr. Paul Nogier's odyssey of auricular scientific discovery began with a case of lumbar-based sciatic pain. At that time, the amygdala was not a consideration (Dr. Paul Nogier had not yet determined the complete auricular-anatomical cartography). However, given that medical research conducted over many decades has revealed that the amygdala plays a major role in pain control—and its emotional motivational components—inclusion of the amygdala as a part of auricular-acupuncture evaluation and treatment is logical. Support for this assertion included a

2015 article by Meier et al. that reported amygdala effects associated with chronic low-back pain.¹² These researchers revealed differentiation of amygdala activity and connectivity to the pregenual anterior cingulate cortex in subjects with and without histories of back pain. The researchers posited that their results shed new light on the underlying psychologic factors relevant to disability with respect to future episodes of lower-back pain.¹² Such evidence supports the application of auricular-amygdala acupuncture when treating back pain, as well as numerous musculoskeletal disorders.

Psychiatric Applications

Medical research involving psychiatric disorders associated with amygdala dysfunction is plentiful. Evidence of its critical significance appears irrefutable. Amygdala changes have been linked to many neuroemotional conditions, including anxiety, depression, post-traumatic stress disorder (PTSD), and phobias. Tang et al. determined that functional connectivity was decreased between the amygdala and the ventral prefrontal cortex in patients suffering from major depressive disorder, compared to patients in healthy control groups.¹³ In a 2011 study, Passarotti et al. observed overactive amygdala function in subjects afflicted with pediatric bipolar disorder (PBD). The researchers recorded various changes in amygdala activity before and after pharmacologic treatment for patients diagnosed with the disorder and concluded that the amygdala was overactive in patients with PBD, compared with healthy controls.¹⁴

A 2016 study conducted by Wang et al. demonstrated the effectiveness of combining the antidepressant fluoxetine (Prozac®) with TCM acupuncture. These researchers concluded that the additional benefit of acupuncture was achieved via its positive regulatory influence on the limbic system, particularly the amygdala and anterior cingulate cortex.¹⁵

Benefits derived from auricular amygdala acupuncture are consistent, precise, and frequently extraordinary. Patients from the current author's clinical practice are well-informed regarding the clinical significance amygdala function and the rationale for addressing it through the auricular-acupuncture microsystem. Thus, such amygdala-savvy patients seek the treatment to address various symptoms and conditions, including anxiety, depression, grief, obsessive compulsive disorder, bipolar manic depression, and general stress management. Upon detection of an auricular point within amygdala zones, electrical stimulation may be provided for 15–30 seconds. Spinex™ intradermal semipermanent needles (size #3) can be inserted and covered with protective adhesive tape. Aiguille Semipermanante (ASP; Sedatelec, France) ear-acupuncture needles may also be inserted in some cases.

Electrical treatment of amygdala-auricular projection points requires an instrument capable of providing the full spectrum of frequencies, as determined by Dr. Paul Nogier

decades ago. The amygdala in Phase 1 (acute) requires a frequency of 160 Hz. An amygdala point detected in Phase 3 (chronic) requires 5 Hz. Phase 2 (degenerative) treatment requires 10 Hz for proper stimulation. In the absence of an electrical stimulator capable of the 5, 10, and 160 Hz frequencies, manual needling is essential.

BRIEF CLINICAL CASE EXAMPLES OF AURICULAR AMYGDALA ACUPUNCTURE USE

The following are brief descriptions of a few of the author's cases involving patients who experienced clinical benefits derived from auricular acupuncture, when the treatment included an amygdala component.

A 40-year-old woman and her sons (ages 15 and 9) seek auricular acupuncture approximately every 2 months to address anxiety, depression, and obsessive-compulsive type symptoms. One or more semipermanent ear acupuncture needles are inserted in points electrically detected within amygdala-projection zones. These patients retain the needles for several weeks, and report noticeable, consistent, and lasting improvements in their conditions.

On several occasions, a 65-year-old businesswoman sought treatment for anxiety and stress management for unpleasant business meetings. She reported consistent and significant and emotional support from having one or more ASP ear acupuncture needles inserted into amygdala zones.

In 2013, a 35-year-old woman with a long history of bipolar manic depression sought auricular acupuncture, specifically with the goal of enabling her to cease long-term usage of prescription medication for bipolar disorder. She had taken various prescription medications since childhood. Among other brain auricular projections treated (pineal gland, corpus callosum, and frontal cortex per Soliman/Nogier localizations), treating amygdala points were instrumental in her achieving her goal. This patient was able to wean herself off all medication easily and has not experienced any bipolar episodes. For several years since initial presentation, she requests auricular acupuncture for preventative maintenance every 1–2 months and experiences astonishing success. She has been able to function extremely well without medication, reporting that the treatment easily, safely, and cost-effectively prevents or manages any impending recurring symptoms.

A 63-year-old female experienced significant grief-management support related to the death of her 97-year-old mother. Electrically active points located in the amygdala Phase 1 zone, as well as an adrenal-gland auricular projection were treated with stainless-steel ASP needles.

A 46-year-old restaurant owner receives weekly stress-management support via amygdala-auricular therapy (usually electrical stimulation, but occasionally ASP needles).

A disabled U.S. merchant marine reports consistent benefit from treatment to manage stress incurred while awaiting a lengthy and uncertain disability benefits decision, as well as managing physical pain and dysfunction from chronic illness.

Additionally, numerous patients request and laud the benefits of amygdala-auricular acupuncture during the holiday season for management of both existing and *anticipated* stressors.

In all cases, electrical stimulation was provided for 15–30 seconds. In some, but not all cases, Spinex intradermal semi-permanent needles (size #3) were inserted and covered with protective adhesive tape. ASP ear acupuncture needles have also been inserted in some cases.

PTSD

Diamond and Zoladz described the amygdala in PTSD as “the bull in the evolutionary China shop.”¹⁶ The misery experienced by the victim is a hyperfunctioning survival state that is abnormal under calm conditions.¹⁶ In a 2008 article, Bryant, et al. reported that approximately half of patients with PTSD did not respond to cognitive-behavioral therapy (CBT), which was considered the conventional treatment of choice at the time. The researchers cited an excessive amygdala response to fear as a key factor in the suboptimal CBT success rate.¹⁷ Dengler et al.'s 2015 study reported that as many as 20% of soldiers returning from Operations Iraqi Freedom and Enduring Freedom were affected by PTSD.¹⁸ Furthermore, ~30% did not respond to conventional medical care. The researchers hypothesized that electrical stimulation of the amygdala would be effective. Their rat model study provided supportive data.¹⁸

Over the past 10 years, more research has been conducted to promote somewhat better outcomes. Koek et al. described the benefits of deep-brain stimulation (DBS) of the basolateral amygdala for combat patients whose PTSD was unresponsive to previous treatment methods.¹⁹ The results of these researchers' 2014 pilot study suggested the potential for DBS due to its targeting of the amygdaloid complex.¹⁹ The DBS procedure involves surgical implantation under anesthesia of a thin insulated-wire electrode into the brain through an opening made in the skull. The intention is to target specific areas of the brain to modulate dysfunctional activity electrically, by a mechanism akin to a pacemaker supporting cardiac rhythm. Another 2014 DBS study conducted with rats revealed reductions in fear-conditioning via direct electrical surgical amygdala treatment.²⁰ Nicholson et al. demonstrated successful amygdala downregulation, using real-time fMRI neurofeedback (rtfMRI-nf). This method utilizes fMRI to monitor a patient's brain activity during scanning, while providing patient feedback. The intent is to train functional brain activity.²¹ Zotev, et al also cited patients' benefits derived from rtfMRI-nf for military veterans suffering from PTSD. The results showed that the

treatment can correct the amygdala-prefrontal functional connectivity, which is altered in PTSD.²²

Successful auricular acupuncture to address pain, as well as PTSD, has been documented in military medicine.²³ A practical proposal is addition of auricular-amygdala evaluation and management to existing protocols and systems. Given that self-regulatory and physiologically sound responses of the amygdala can be evoked via stimulation of its auricular-projection sites; expanding existing approaches with inclusion would be easy to implement and cost-effective. However, electrical acupuncture point-detection devices would be necessary; no uniform and consistent “amygdala point” exists. If stress or dysfunction exists, one or more amygdala points may be found by scanning the auricle of the patient’s three distinct and separate phase projection zones. As a complementary approach, treatment of such points could prove to be invaluable, particularly with challenging or unresponsive cases of PTSD and other emotion-based disorders.

Gastrointestinal Considerations

Amygdala function has been considered for addressing various gastrointestinal (GI) disorders. Henke’s 1988 animal study indicated an amygdala-related emotional component correlated with susceptibility to stress ulcers.²⁴ Myers et al. cited the necessity for addressing the amygdala’s role in the pathophysiology of irritable-bowel syndrome (IBS) to enhance therapeutic outcomes.²⁵ In such cases, the usage of corticosteroids presents concerns. A 2007 article by Brown et al. suggested that corticosteroid exposure could provoke diminishing of amygdala volume.²⁶

Corrective outcomes for conditions, such as gastroesophageal reflux disease and IBS are rare, prompting the need for other avenues of treatment. From an auricular-therapy perspective, addressing the energetic projections of GI structures in all 3 Nogier phases is a logical course of action. However, it must be preceded by evaluation of energetic blockages, including amygdala-projection sites. No single or distinct “reflux point” exists, nor is there a single anatomical auricular point for the esophagus or stomach. The existing body of research data revealing a potential amygdala component of GI dysfunction also justifies consideration of auricular therapy, complementing any necessary medications, dietary changes, and other natural and holistic supports.²⁷

Olfactory Function

In 1997, Zald and Pardo explored human responses to stimuli.²⁸ At the time, electrophysiologic and lesion studies of animals had provided most scientific knowledge of the amygdala and emotional processing. These researchers’ positron emission tomography research revealed correlations of amygdala function and emotional processing of olfactory stimuli.²⁸

A 2017 case study documented auricular acupuncture’s effect on olfactory function. A 20-year-old man who had no cognition of the sense of smell throughout his life, acquired this sense as the direct result of a single auricular-acupuncture treatment.²⁹ Approximately 1 month following insertion of 6 semipermanent ear acupuncture needles, this patient acquired an olfactory sense and has maintained it for more than 1 year, with no need for further treatment. One of the needles was inserted in a point electrically located in the Phase 1 auricular zone (on the lobule).²⁹

Erectile Dysfunction

A 2000 article by Heaton suggested an amygdala component associated with erectile dysfunction (ED).³⁰ Chen et al. investigated psychogenic components of ED and determined that amygdala abnormalities could be a factor.³¹ Although the aforementioned studies primarily focused on neuropharmacologic advancement, their findings provided a rationale for addressing auricular-acupuncture projections of the amygdala as part of protocols for patients with ED who desire this treatment. In a 2007 article, Soliman proposed auricular therapy for somatotopic projection of the amygdala in the Phase 3 zone (in addition to various other projections).³²

Renal Function

Numerous acupuncture applications involve consideration of kidney bioenergetic function. Conventional medical research cites favorable responses to amygdala stimulation relevant to renal function. Koepke et al.’s 1987 study determined that stimulation of the amygdala prevented increased sympathetic-nerve activity and a decrease in the excretion of sodium in the urine.³³ In 2017, Chen et al. published fMRI research that revealed significant and specific amygdala-based emotional processing for patients who were receiving hemodialysis.³⁴ Such data justify expansion of acupuncture research regarding renal function beyond the consideration of only its effects on genitourinary structures; amygdala-auricular acupuncture could prove to be a beneficial enhancement.

CONCLUSIONS

Medical research has validated influencing amygdala function by various medical means, in pursuit of alleviating numerous maladies. Three auricular-acupuncture microsystem energetic projection zones have been established for the amygdala, comprising a basis for treatment in clinical practice.¹ During a clinical encounter, 1 or more points might exist that correlate with amygdala distress. They can be detected via electrical dermal evaluation and treated accordingly.

It appears plausible that, other than direct-to-brain amygdala-stimulation techniques, auricular acupuncture may provide the closest access presently possible. Auricular-amygdala acupuncture empowers clinicians with an extraordinarily safe, rapid, highly accessible and cost-effective means by which amygdala function can be affected positively, as a complementary or primary support for addressing a broad range of disorders. Medical knowledge of the amygdala's clinical significance, combined with the benefits derived through its application (as observed by both practitioners and patients) is a rationale for its implementation in many medical settings, as well as being an impetus for conducting further research.

DISCLOSURE STATEMENT

No competing financial conflicts exist.

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