Acupuncture

Elia Vecchione, PhD
Leonard Vecchione, MA
Michael VanDenBergh, MA
Julie Ballschneider, BS

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General

Abbate, D., Santamaria, A., Brambilla, A., Panerai, A. E., & Di Giulio, A. M. (1980). beta-Endorphin and electroacupuncture. *The Lancet, 316*(8207), 1309.

Anderson, B., Nielsen, A., Kligler, B., & McKee, D. (2012). Acupuncture and heart rate variability: a systems level approach to understanding mechanism. *BMC Complementary and Alternative Medicine*, *12*(Suppl 1), 302.

Recent research has elucidated several different mechanisms for acupuncture. However the inter-relationship between these mechanisms and how acupuncture affects complex physiological systems is still not understood. Heart rate variability (HRV), the beat-to-beat fluctuations in the rhythm of the heart, results from the regulation of the heart by the autonomic nervous system (ANS). Low HRV is associated with increased risk of all-cause mortality and is a marker for a wide range of diseases. Coherent HRV patterns are associated with increased synchronization between the two branches of the ANS, and when sustained for long periods of time result in increased synchronization and entrainment between multiple body systems. This presentation is a systematic review of the clinical trials that have been undertaken examining the effect of acupuncture on HRV and the implications for HRV representing a systems level mechanism for acupuncture.

Bemis, R. (2013). Evidence for the NADA Ear Acupuncture Protocol: Summary of Research A Review of Literature. National Acupuncture Detoxification Association.

The National Acupuncture Detoxification Association (NADA) ear acupuncture protocol, originally developed for addiction treatment, has been adopted as a complementary therapy within a variety of community health settings. This review first offers an introduction to the NADA protocol, including its origins, development and its adjunctive application as a comprehensive model of care. Second, a review of evidence is offered on the use of the NADA protocol within addictions, behavioral health and cancer care.

Berman, A. H., & Lundberg, U. (2002). Auricular acupuncture in prison psychiatric units: a pilot study. *Acta Psychiatrica Scandinavica*, *106*(s412), 152-157.

Objective: The study explores whether auricular acupuncture can be a viable treatment form for inmates in prison psychiatric units. Method: Inmates in a prison psychiatric unit and in a support unit for violent behavior were offered group treatment with auricular acupuncture three times a week over a period of 9 months. Another prison psychiatric unit served as a control group. Results: Twenty-two inmates received treatment, and 11 inmates received treatment for over 8 weeks. Cortisol levels were higher for inmates in the support unit than for the other two groups. Inmates treated at least 25 times were prescribed fewer psycholeptic drugs than controls. Perceived autonomy increased for treated inmates in the psychiatric unit. Inmates treated for over 8 weeks experienced improved inner harmony and calm and better clarity over future plans. Conclusion: Acupuncture is a non-verbal form of treatment appropriate for prison psychiatric units. The treatment facilitates contact and complements other psycho-social treatment forms.

Da Silva, M. A., & Dorsher, P. T. (2014). Neuroanatomic and clinical correspondences: acupuncture and vagus nerve stimulation. *Journal of Alternative and Complementary Medicine*, *20*(4), 233-240.

BACKGROUND: The use of surgically implanted electronic devices for vagus nerve stimulation (VNS) is expanding in contemporary allopathic medical practice as a treatment option for selected clinical conditions, such as epilepsy, depression, tremor, and pain conditions, that are unresponsive to standard pharmacologic interventions. Although VNS device surgeries are considered minimally invasive, they are costly and have surgical and device-related risks; they can also cause serious adverse effects from excessive vagus nerve stimulation. OBJECTIVES: For millennia, acupuncturists have treated those same clinical conditions by piquering acupoints that are located proximate to the sternocleidomastoid muscle site where the VNS device is implanted on the vagus nerve. The hypothesis of this study is that these acupuncture points produce clinical benefits through stimulation of the vagus nerve and/or its branches in the head and neck region. METHODS: By using reference anatomic and acupuncture texts, classical and extraordinary acupoints in the head and neck region were identified that are anatomically proximate to vagus nerve pathways there, where the VNS electrode is surgically implanted. The clinical indications of these acupuncture points, as described in the acupuncture reference texts, were examined for similarities to those of VNS. RESULTS: This analysis demonstrated marked correspondences of the indications for those lateral head and neck acupoints to the clinical effects (beneficial and adverse) documented for the VNS device in the medical literature. This clinical correspondence, in conjunction with the anatomic proximity of the acupoints to the vagus nerve in the lateral neck, strongly suggests that vagus nerve (and hence the autonomic nervous system) stimulation is fundamental in producing the clinical effects of the acupoints. CONCLUSION: By having anatomic access to the vagus nerve and parasympathetic chain that permits electrical stimulation of those nerves in clinical practice, acupuncture may offer a less costly and safer alternative to implanted VNS devices for treating medically refractory epilepsy, tremor, depression, and pain conditions.

Eshkevari, L., Permaul, E., & Mulroney, S. E. (2013). Acupuncture blocks cold stress-induced increases in the hypothalamus-pituitary-adrenal axis in the rat. *Journal of Endocrinology*, *217*(1), 95-104.

Electroacupuncture (EA) is used to treat chronic stress; however, its mechanism(s) of action in allaying stress remains unclear. The interplay of stress hormones of the hypothalamus-pituitary-adrenal axis (HPA) and the sympathetic nervous system (SNS) is critical in the stress response. Our objective was to determine whether EA at acupoint, stomach 36 (EA St_{36}) is effective in preventing chronic cold stress-induced increased hormone levels in the rat by examining four groups of animals, three of which were exposed to cold and one of which was a non-treatment control group. Before exposure to the cold, two groups were treated with either EA St_{36}, or Sham-EA, before 10 days of cold stress. The EA St_{36} animals demonstrated a significant decrease in peripheral HP hormones (ACTH and CORT) compared with stress animals ($P<0.05$). These effects were specific; rats receiving Sham-EA had elevation of these hormones, similar to the stress-only animals. These effects were mirrored centrally in the brain; CRH levels were significantly ($P<0.05$) reduced in EA St_{36} animals compared with the other animals. Finally, EA effect on peripheral and adrenal SNS hormones (norepinephrine (NE) and neuropeptide Y (NPY) respectively) was examined, with no significant difference noted in adrenal tyrosine hydroxylase or circulating NE in any of the groups. However, EA St_{36} was effective in preventing stress-induced elevation is adrenal Npy mRNA. These results indicate that EA St_{36} blocks the chronic stress-induced elevations in the HPA and the sympathetic NPY pathway, which may be a mechanism for its specific stress-allaying effects.

He, W., Wang, X., Shi, H., Shang, H., Li, L., Jing, X., & Zhu, B. (2012). Auricular Acupuncture and Vagal Regulation. *Evidence-Based Complementary and Alternative Medicine*, *2012*, Article ID 786839.

Auricular acupuncture has been utilized in the treatment of diseases for thousands of years. Dr. Paul Nogier firstly originated the concept of an inverted fetus map on the external ear. In the present study, the relationship between the auricular acupuncture and the vagal regulation has been reviewed. It has been shown that auricular acupuncture plays a role in vagal activity of autonomic functions of cardiovascular, respiratory, and gastrointestinal systems. Mechanism studies suggested that afferent projections from especially the auricular branch of the vagus nerve (ABVN) to the nucleus of the solitary tract (NTS) form the anatomical basis for the vagal regulation of auricular acupuncture. Therefore, we proposed the "auriculovagal afferent pathway" (AVAP): both the autonomic and the central nervous system could be modified by auricular vagal stimulation via projections from the ABVN to the NTS. Auricular acupuncture is also proposed to prevent neurodegenerative diseases via vagal regulation. There is a controversy on the specificity and the efficacy of auricular acupoints for treating diseases. More clinical RCT trials on auricular acupuncture and experimental studies on the mechanism of auricular acupuncture should be further investigated.

Hou, P., Hsu, H, Lin, Y., Tang, N., Cheng, C., & Hsieh, C. (2015). The History, Mechanism, and Clinical Application of Auricular Therapy in Traditional Chinese Medicine. *Evidence-Based Complementary and Alternative Medicine*, *(2015)*, Article ID 495684.

Auricular therapy includes acupuncture, electroacupuncture, acupressure, lasering, cauterization, moxibustion, and bloodletting in the auricle. For 2500 years, people have employed auricular therapy for treating diseases, but the methods have been limited to bloodletting and cauterization. Only after 1957, the international scientific community became aware that the map of the ear resembles an inverted fetus, its introduction has led to auricular acupuncture (AA) becoming a more systemic approach, and, following the identification and standardization of more precise points, AA has been employed in clinical applications. The mechanisms of AA are considered to have a close relationship with the autonomic nervous system, the neuroendocrine system, neuroimmunological factors, neuroinflammation, and neural reflex, as well as antioxidation. Auricular therapy has been applied, for example, for pain relief, for the treatment of epilepsy, anxiety, and obesity, and for improving sleep quality. However, the mechanisms and evidence for auricular therapy warrant further study.

Hui, K. K., Liu, J., Marina, O., Napadow, V., Haselgrove, C., Kwong, K. K., Kennedy, D. N., & Makris, N. (2005). The integrated response of the human cerebro-cerebellar and limbic systems to acupuncture stimulation at ST 36 as evidenced by fMRI. *NeuroImage*, *27*(3), 479-496.

Clinical and experimental data indicate that most acupuncture clinical results are mediated by the central nervous system, but the specific effects of acupuncture on the human brain remain unclear. Even less is known about its effects on the cerebellum. This fMRI study demonstrated that manual acupuncture at ST 36 (Stomach 36, Zusanli), a main acupoint on the leg, modulated neural activity at multiple levels of the cerebro-cerebellar and limbic systems. The pattern of hemodynamic response depended on the psychophysical response to needle manipulation. Acupuncture stimulation typically elicited a composite of sensations termed deqi that is related to clinical efficacy

according to traditional Chinese medicine. The limbic and paralimbic structures of cortical and subcortical regions in the telencephalon, diencephalon, brainstem and cerebellum demonstrated a concerted attenuation of signal intensity when the subjects experienced deqi. When deqi was mixed with sharp pain, the hemodynamic response was mixed, showing a predominance of signal increases instead. Tactile stimulation as control also elicited a predominance of signal increase in a subset of these regions. The study provides preliminary evidence for an integrated response of the human cerebro-cerebellar and limbic systems to acupuncture stimulation at ST 36 that correlates with the psychophysical response.

Kurono, Y., Minagawa, M., Ishigami, T., Yamada, A., Kakamu, T., & Hayano, J. (2011). Acupuncture to Danzhong but not to Zhongting increases the cardiac vagal component of heart rate variability. *Autonomic Neuroscience: Basic and Clinical*, *161*(1-2), 116-120.

There is currently no convincing evidence that acupuncture has any specific effects on autonomic nervous function as assessed by heart rate variability (HRV). We examined whether the stimulation of neighboring acupunctural points, Danzhong (CV17) and Zhongting (CV16) on the anterior median line of the thorax, induced different effects on HRV. In 14 healthy males, epifascial acupunctural stimulation (single instantaneous needle stimulation on the fascial surface without producing De-Qi sensation) was performed at CV17 and CV16 on different days in a clinical study utilizing a cross-over design. We found that the stimulation of CV17, but not of CV16, decreased the heart rate (P=0.01, repeated measures ANOVA) and increased the power of the high-frequency component of the HRV, an index of cardiac vagal activity (P=0.01). The low-frequency to high-frequency ratio, an index of sympathetic activity showed no significant changes for either point. Our observations could not be explained as either nonspecific or psychological/placebo effects of needle stimulation. This study provides strong evidence for the presence of a specific acupunctural point that causes the modulation of cardiac autonomic function.

Langevin, H. M., Churchill, D. L., Wu, J., Badger, G. J., Yandow, J. A., Fox, J. R., & Krag, M. H. (2002). Evidence of connective tissue involvement in acupuncture. *The FASEB Journal*, *16*(8), 872-874.

Acupuncture needle manipulation gives rise to "needle grasp," a biomechanical phenomenon characterized by an increase in the force necessary to pull the needle out of the tissue (pullout force). This study investigates the hypothesis that winding of connective tissue, rather than muscle contraction, is the mechanism responsible for needle grasp. We performed 1) measurements of pullout force in humans with and without needle penetration of muscle; 2) measurements of pullout force in anesthetized rats, with and without needle rotation, followed by measurements of connective tissue volume surrounding the needle; 3) imaging of rat abdominal wall explants, with and without needle rotation, using ultrasound scanning acoustic microscopy. We found 1) no evidence that increased penetration of muscle results in greater pullout force than increased penetration of subcutaneous tissue; 2) that both pullout force and subcutaneous tissue volume were increased by needle rotation; 3) that increased periodic architectural order was present in subcutaneous tissue with rotation, compared with no rotation. These data support connective tissue winding as the mechanism responsible for the increase in pullout force induced by needle rotation. Winding may allow needle movements to deliver a mechanical signal into the tissue and may be key to acupuncture's therapeutic mechanism.

Rabischong, P., & Terral, C. (2014). Scientific Basis of Auriculotherapy: State of the Art. *Acupuncture in Medicine*, *26*(2), 84-96.

Background: Using a modern scientific basis, this article examines clinical findings and experimentally reproducible data that demonstrate reliably the objective reality of the auriculotherapy procedures initiated by Paul Nogier, MD, of Lyon, France. Objective: The aims of this review are to: (1) identify the Chinese acupoints and all relevant related subjects; (2) offer a critical analysis of different auricle cartographies or ear maps; and (3) evaluate evidence for auriculotherapy with respect to the constant progress of our knowledge of nervous-system organization. Discussion: Acupuncture points have lower electrical impedance than nonacupoints. This was demonstrated by Niboyet and Terral, utilizing a sinusoidal current with the technical arrangements of different equivalent circuits made at Unit 103 of the French National Institute of Health and Medical Research (INSERM), Montpellier, France. This work demonstrated that physical behavior associated with acupuncture corresponds to a specific histologic structure located within the dermis termed the neurovascular complex (NVC). The concept of using sham points for testing acupuncture needs to be criticized. A reproducible experimental model of analgesia has been produced using the hind limb of a rabbit; this model is a proven demonstration of the positive action of acupuncture on pain. Acupuncture analgesia is a technique that has been used effectively by Chinese researchers in the 1970s for surgical applications. The different ear maps may have to be significantly modified because of the paucity of scientific validation of most of the localizations of organs or functions and, particularly, of nervous structures. Increased knowledge about complex nervous interactions should facilitate formulation of some scientifically acceptable hypothesis to explain the action of auriculotherapy. Conclusions: More scientific research should be performed to improve the scientific credibility of auriculotherapy.

Sapolsky, R. M. (2004). *Why zebras don't get ulcers: The acclaimed guide to stress, stress-related diseases, and coping*. New York, NY: Holt Paperbacks, Macmillan.

Spire-Sweet, T., & Powell, C. (Producers). (2014, March 24). *The Science Behind Acupuncture* [Audio podcast]. Retrieved from http://yinyangpodcast.com/all-podcasts/65-19-the-science-behind-acupuncture.html

Spire-Sweet, T., & Powell, C. (Producers). (2014, May 31). *The Science Behind Acupuncture Part 2* [Audio podcast]. Retrieved from http://yinyangpodcast.com/all-podcasts/72-24-the-science-behind-acupuncture-part-2.html

Williams, D. P., Cash, C., Rankin, C., Bernardi, A., Koenig, J., & Thayer, J. F. (2015). Resting heart rate variability predicts self-reported difficulties in emotion regulation: a focus on different facets of emotion regulation. *Frontiers in Psychology*, *6*, 261.

The Model of Neurovisceral Integration suggests that vagally mediated heart rate variability (vmHRV) represents a psychophysiological index of inhibitory control and thus, is associated with emotion regulation capacity. Over the past decade, growing empirical evidence supports this notion, showing that those with higher resting vmHRV can regulate negative emotions more adequately. However, to our knowledge, no study has previously examined how resting vmHRV may relate to everyday perceived difficulties in emotion regulation. The present study attempts to examine such relationship in 183 undergraduate students (98 female, 60 minority, mean Age = 19.34). Resting vmHRV was collected during a 5-min resting baseline period, and everyday

difficulties in emotion regulation were assessed using the Difficulties in Emotion Regulation Scale (DERS). Controlling for potential covariates (including both trait anxiety and rumination), results revealed a negative relationship between resting vmHRV and DERS such that lower resting vmHRV was associated with greater difficulties in emotional regulation, especially a lack of emotional clarity and impulse control, as indicated by the respective subscales of the DERS. These findings provide further evidence for the Neurovisceral Integration Model, suggesting that emotion regulation and autonomic regulation share neural networks within the brain. Moreover, the present study extends prior research by highlighting two distinct facets of emotion regulation (impulse control and emotional clarity) that should be of particular interest when investigating the link between emotion regulation, resting vmHRV, and related health outcomes including morbidity and mortality.

Yu, J. S., Zeng, B. Y., & Hsieh, C. L. (2013). Acupuncture stimulation and neuroendocrine regulation. *International Review of Neurobiology*, *111,* 125-140.

Acupuncture has been used to treat different conditions for at least 3000 years in China and has gained increasing acceptance worldwide. The acupuncture needle inserted into the muscle layer at the acupoint produces the so-called obtaining qi sensation that causes the excitation of A-δ and C-fibers of the muscle tissue, resulting in afferent signals. The afferent signals pass through the dorsal horn cells of the spinal cord ascending to the brain, such as the hypothalamus, enhancing the release of neuropeptides and hormones, and these afferent signals in the spinal segment may innervate the visceral organ, inducing effect on visceral function. Here, we reviewed the effect of acupuncture stimulation on neuropeptides and hormones, including β-endorphin, serotonin, oxytocin, adrenocorticotropic hormone, gonadotropin-releasing hormone, corticotrophin-releasing hormone, cholecystokinin, and acetylcholine, as well as insulin sensitivity, immunomodulation (anti-inflammation), and autonomic nerve activity.

Sleep Disorders

Cao, H., Pan, X., Li, H., & Liu, J. (2009). Acupuncture for Treatment of Insomnia: A Systematic Review of Randomized Controlled Trials. *Journal of Alternative and Complementary Medicine*, *15*(11), 1171-1186.

Background Acupuncture is commonly used in treating insomnia in China, and clinical studies have shown that acupuncture may have a beneficial effect on insomnia compared with Western medication. Methods We included randomized controlled trials on acupuncture for insomnia. We searched PubMed, the Cochrane Library (2008 Issue 3), China Network Knowledge Infrastructure (CNKI), Chinese Scientific Journal Database (VIP), and Wan Fang Database. All searches ended in December 2008. Two authors extracted data and assessed the trials' quality independently. RevMan 5.0.17 software was used for data analysis with effect estimate presented as relative risk (RR) and mean difference (MD) with a 95% confidence interval (CI). Results Forty-six (46) randomized trials involving 3811 patients were included, and the methodological quality of trials was generally fair in terms of randomization, blinding, and intention-to-treat analysis. Meta-analyses showed a beneficial effect of acupuncture compared with no treatment (MD −3.28, 95% CI −6.10 to −0.46, p = 0.02; 4 trials) and real acupressure compared with sham acupressure (MD −2.94, 95% CI −5.77 to −0.11, p = 0.04; 2 trials) on total scores of Pittsburgh Sleep Quality Index. Acupuncture was superior to medications regarding the number of patients with total sleep duration increased for >3

hours (RR 1.53, 95% CI 1.24–1.88, p < 0.0001). However, there was no difference between acupuncture and medications in average sleep duration (MD −0.06, 95% CI −0.30–0.18, p = 0.63). Acupuncture plus medications showed better effect than medications alone on total sleep duration (MD 1.09, 95% CI 0.56–1.61, p < 0.0001). Similarly, acupuncture plus herbs was significantly better than herbs alone on increase of sleep rates (RR 1.67, 95% CI 1.12–2.50, p = 0.01). There were no serious adverse effects with related to acupuncture treatment in the included trials. Conclusions Acupuncture appears to be effective in treatment of insomnia. However, further large, rigorous designed trials are warranted.

Autism Spectrum Disorder

Cheuk, D. K., Wong, V., & Chen, W. X. (2011). Acupuncture for autism spectrum disorders (ASD). *The Cochrane Database of Systematic Reviews*, *7*(9), CD007849.

BACKGROUND: Autism spectrum disorders (ASD) are characterized by impairment in social interaction, impairment in communication and lack of flexibility of thought and behavior. Acupuncture, which involves the use of needles or pressure to specific points on the body, is used widely in Traditional Chinese Medicine and increasingly within a western medical paradigm. It has sometimes been used as a treatment aimed at improving ASD symptoms and outcomes, but its clinical effectiveness and safety has not been rigorously reviewed. OBJECTIVES: To determine the effectiveness of acupuncture for people with ASD in improving core autistic features, as well as communication, cognition, overall functioning and quality of life, and to establish if it has any adverse effects. SEARCH STRATEGY: We searched the following databases on 30 September 2010: CENTRAL (The Cochrane Library, 2010, Issue 3), MEDLINE (1950 to September 2010 Week 2), EMBASE (1980 to 2010 Week 38), PsycINFO, CINAHL, China Journal Full-text Database, China Master Theses Full-text Database, China Doctor Dissertation Full-text Database, China Proceedings of Conference Database, Index to Taiwan Periodical Literature System, metaRegister of Controlled Trials and the Chinese Clinical Trials Registry. We also searched AMED (26 February 2009) and Dissertation Abstracts International (3 March 2009), but these were no longer available to the authors or editorial base at the date of the most recent search. TCMLARS (Traditional Chinese Medical Literature Analysis and Retrieval System) was last searched on 3 March 2009. SELECTION CRITERIA: We included randomized and quasi-randomized controlled trials. We included studies comparing an acupuncture group with at least one control group that used no treatment, placebo or sham acupuncture treatment in people with ASD. We excluded trials that compared different forms of acupuncture or compared acupuncture with another treatment. DATA COLLECTION AND ANALYSIS: Two review authors independently extracted trial data and assessed the risk of bias in the trials. We used relative risk (RR) for dichotomous data and mean difference (MD) for continuous data. MAIN RESULTS: We included 10 trials that involved 390 children with ASD. The age range was three to 18 years and the treatment duration ranged from four weeks to nine months. The studies were carried out in Hong Kong, mainland China and Egypt.Two trials compared needle acupuncture with sham acupuncture and found no difference in the primary outcome of core autistic features (RFRLRS total score: MD 0.09; 95% CI -0.03 to 0.21, P = 0.16), although results suggested needle acupuncture might be associated with improvement in some aspects of the secondary outcomes of communication and linguistic ability, cognitive function and global functioning.Six trials compared needle acupuncture plus conventional treatment with conventional treatment alone. The trials used different primary outcome measures and most could not demonstrate effectiveness of acupuncture in improving core autistic features in general,

though one trial reported patients in the acupuncture group were more likely to have improvement on the Autism Behavior Checklist (RR 1.53; 95% CI 1.09 to 2.16, P = 0.02) and had slightly better post-treatment total scores (MD -5.53; 95% CI -10.76 to -0.31, P = 0.04). There was no evidence that acupuncture was effective for the secondary outcome of communication and linguistic ability, though there seemed to be some benefit for the secondary outcomes of cognitive function and global functioning.Two trials compared acupressure plus conventional treatment with conventional treatment alone and did not report on the primary outcome. Individual study results suggested there may be some benefit from acupressure for certain aspects of the secondary outcomes of communication and linguistic ability, cognitive function and global functioning.Four trials reported some adverse effects, though there was little quantitative information, and at times both intervention and control groups experienced them. Adverse effects noted included bleeding, crying due to fear or pain, irritability, sleep disturbance and increased hyperactivity. None of the trials reported on quality of life.There are a number of problems with the evidence base: the trials were few in number and included only children; six of the trials were at high risk of bias; they were heterogeneous in terms of participants and intervention; they were of short duration and follow-up; they reported inconsistent and imprecise results, and, due to carrying out large numbers of analyses, they were at risk of false positivity. AUTHORS' CONCLUSIONS: Current evidence does not support the use of acupuncture for treatment of ASD. There is no conclusive evidence that acupuncture is effective for treatment of ASD in children and no RCTs have been carried out with adults. Further high quality trials of larger size and longer follow-up are needed.

Li, N., Jin, B. X., Li, J. L., & Liu, Z. H. (2011). Treatment of autism with scalp acupuncture. *Zhongguo Zhen Jiu*, *31*(8), 692-696.

OBJECTIVE: To verify the efficacy on autism treated with scalp acupuncture for regaining the consciousness and opening the orifice in children. METHODS: Seventy cases of child autism were divided into an observation group (30 cases) and a control group (40 cases). In observation group, the cases were treated with scalp acupuncture for regaining the consciousness and opening the orifice, in combination with music therapy and structure education method. Scalp acupuncture was applied to intelligent nine needles (frontal five needles, Sishencong (EX-HN 1)), affection area, heart and liver area, once a day, at the interval once every one week. Totally, 60 treatments made one session. In control group, music therapy and structure education method were applied simply. Clancy Autism Behavior Scale, Childhood Autism Behavior Scale (CARS), Autism Behavior Checklist (ABC) and Gesell Developmental Scale (social adaptive behaviors and language development) were adopted to assess the scores before treatment and after 1 session of treatment. RESULTS: After treatment, the scores in Clancy Autism Behavior Scale, CARS and ABC were lower apparently in observation group as compared with those before treatment (all P < 0.01), and the scores in Clancy Autism Behavior Scale and ABC were lower than those in control group (both P < 0.01). In observation group, the scores of social adaptive behavior scale and language development scale were improved obviously after treatment (both P < 0.01), which were all higher than those in control group (both P < 0.01). In observation, between the group aged from 4 to 6 years and the group aged from 2 to 3 years, the value differences in Clancy Autism Behavior Scale, ABC and social adaptive development scale did not present statistical significance in group comparison before and after treatment (all P > 0.05). CONCLUSION: Scalp acupuncture for regaining the consciousness and opening the orifice can significantly improve the efficacy on autism, effectively relieve child autism

symptoms and enhance the intelligence, language ability and social adaptive ability. Moreover, the efficacy cannot be impacted by child's age.

Ming, X., Chen, X., Wang, X. T., Zhang, Z., Kang, V., & Zimmerman-Bier, B. (2012). Acupuncture for Treatment of Autism Spectrum Disorders. *Evidence-Based Complementary and Alternative Medicine*, *2012*, Article ID 679845.

Background. There has been lack of reviews of evidence on efficacy, methodology, and/or safety of acupuncture in autism spectrum disorders. This paper examines the emerging evidence of the effects of acupuncture in the treatment of autistic children. Method. A literature review was completed via Medline and three Chinese search engines. A total of 31 studies were evaluated for acupuncture methodology, study design, treatment effects, and tolerability. Results. The acupoints used, the duration of needling, the frequency of treatment, the choice of stimulation, and the course of the treatment were highly variable amongst the studies. Behavioral and/or developmental improvements were reported in all acupuncture treatment studies. All studies reported general tolerability. Weakness of experimental designs was discussed. Conclusions. Vigorously controlled double-blinded clinical trials are needed to evaluate the efficacy and safety of acupuncture in children with autism spectrum disorders.

Wong, V. C., & Chen, W. X. (2010). Randomized controlled trial of electro-acupuncture for autism spectrum disorder. Alternative Medicine Review, *15*(2), 136-146.

OBJECTIVE: To study the efficacy, safety, and compliance of short-term electro-acupuncture for children with autism spectrum disorder (ASD). DESIGN: Randomized, double-blind, sham-controlled, clinical trial. SUBJECTS AND METHODS: Children with ASD were randomly assigned to an electro-acupuncture (EA) group (n=30) or a sham electro-acupuncture (SEA) group (n=25) matched by age and severity of autism. The EA group received electro-acupuncture for selected acupoints while the SEA group received sham electro-acupuncture to sham acupoints. A total of 12 EA and SEA sessions over four weeks were given. Primary outcome measures included Functional Independence Measure for Children (WeeFIM), Pediatric Evaluation of Disability Inventory (PEDI), Leiter International Performance Scale-Revised (Leiter-R), and Clinical Global Impression-Improvement (CGI-I) scale. Secondary outcome measures consisted of Aberrant Behavior Checklist (ABC), Ritvo-Freeman Real Life Scale (RFRLS), Reynell Developmental Language Scale (RDLS), and a standardized parental report. Data were analyzed by the Mann-Whitney test. RESULTS: There were significant improvements in the language comprehension domain of WeeFIM (p=0.02), self-care caregiver assistant domain of PEDI (p=0.028), and CGI-I (p=0.003) in the EA group compared to the SEA group. As for the parental report, the EA group also showed significantly better social initiation (p=0.01), receptive language (p=0.006), motor skills (p=0.034), coordination (p=0.07), and attention span (p=0.003). More than 70 percent of children with ASD adapted to acupuncture easily, while eight percent had poor acupuncture compliance. Mild side effects of minor superficial bleeding or irritability during acupuncture were observed. CONCLUSION: A short, four-week (12 sessions) course of electro-acupuncture is useful to improve specific functions in children with ASD, especially for language comprehension and self-care ability.

Wong, V. C., & Sun, J. G. (2010). Randomized controlled trial of acupuncture versus sham acupuncture in autism spectrum disorder. *Journal of Alternative and Complementary Medicine*, *16*(5), 545-553.

OBJECTIVE: We aim to study the efficacy of acupuncture versus sham acupuncture in children with autism spectrum disorder. METHODS: A single-blind randomized control trial was conducted in 50 children. These children were randomly assigned to the treatment group with tongue acupuncture (40 sessions over 8 weeks) or the control group (sham tongue acupuncture to nonacupoints in the tongue). RESULTS: There was improvement in both the treatment and control groups in all assessed measures but more so in the treatment than in the control group: (1) eye-hand coordination, performance, and practical reasoning of Griffiths Mental Developmental Scale; (2) sensory-motor, social, affectual, language, and total score of Ritvo-Freeman Real Life Scale; (3) Comprehension Language age in the Reynell Language Developmental Scale; and (4) Total Score and Mental Age in Symbolic Play Test. The only statistically significant improvement in the treatment as compared to the control group was seen in self-care and cognition domains of the Functional Independence Measure for children. CONCLUSIONS: We had demonstrated that a short course of acupuncture had efficacy in improving various developmental and behavioral aspects of children with autism. The long-term efficacy in functional gain needs to be further explored.

Wong, V. C., Sun, J. G., & Yeung, D. W. C. (2014). Randomized control trial of using tongue acupuncture in autism spectrum disorder. *Journal of Traditional Chinese Medical Sciences*, *1*(1), 62-72.

Objective The therapeutic approach of traditional chinese Medicine (TCM) in autism spectrum disorder (ASD) is a functional one. To study the efficacy, safety and functional brain change from the use of tongue acupuncture (TAC) on ASD children. Methods 21 autistic boys (3–16 years old) were randomly assigned to TAC group (TAC: n = 12; receiving daily TAC for 8 weeks) or control (C: n = 9; no acupuncture). Primary outcome measures included Autism Treatment Evaluation Checklist (ATEC), Reynell Language Developmental Scale, Symbolic Play Test (SPT), Functional Independence Measure for Children (WeeFIM), Clinical Global Impression (CGI) Scale and Cerebral FDG Metabolism by PET. Results There were significant improvement in speech domain of ATEC (p = 0.030), Self-care domain of WeeFIM (p = 0.021), cognition domain of WeeFIM (p = 0.001) and Total score domain of WeeFIM (p = 0.001) in TAC group compared to the C group. There were significant difference in positive clinical response between C and TAC group in language (p = 0.0211), functional (p = 0.0011), parental Impression criteria (p = 0.0003) and overall cerebral glucose metabolism (p = 0.0451) using ROC criteria. No significant association of PET Glucose Metabolism with Clinical response was found. None of the children developed any side-effects. Conclusion A short course of TAC can improve specific functions in children with autism spectrum disorder, especially speech and cognition function. No statistical significant association of PET Glucose Metabolism with Clinical response. Larger scale with more sample size trial should be done for further investigation.

Depression

Geib, J., Rieger, M. A., Joos, S., Eschweiler, G. W., Dresler, T., & Metzger, F. G. (2015). Introduction of Auricular Acupuncture in Elderly Patients Suffering from Major Depression: Protocol of a Mixed Methods Feasibility Study. *BioMed Research International*, *2015*, Article ID 678410.

Background. Due to an increasing number of elderly people suffering from major depression and potential side effects of the prescribed drugs, the introduction of new therapeutic approaches is needed. Currently, in Germany, auricular acupuncture is no

part of clinical care for gerontopsychiatric patients. Based on promising clinical experiences and existing evidence for treating addiction and trauma, a benefit of auricular acupuncture integrated in existing treatment programs in elderly patients may be hypothesized. Within this project auricular acupuncture according to the National Acupuncture Detoxification Association (NADA) will be integrated in the multimodal treatment regime for elderly patients with major depression in a daytime ward setting. Methods/Design. To evaluate the feasibility and acceptance a mixed method approach is used. In a day clinic, a sample of 20 psychogeriatric patients with the diagnosis of major depression will be enrolled. The patients will receive a total of nine auricular acupuncture treatments according to the standardized NADA protocol in a group setting. The therapeutic process, its organization, the experience, and the willingness of patients to participate will be evaluated by interviews with patients and the therapeutic team. Data will be analyzed qualitatively using content analysis. Additionally, quantitative outcome parameters will be measured by standardized questionnaires.

Mukaino, Y., Park, J., White, A., & Ernst, E. (2005). The effectiveness of acupuncture for depression--a systematic review of randomised controlled trials. *Acupuncture in Medicine, 23*(2), 70-76.

OBJECTIVE: To summarise the existing evidence on acupuncture as a therapy for depression. METHODS: RCTs were included, in which either manual acupuncture or electroacupuncture was compared with any control procedure in subjects with depression. Data were extracted independently by two authors. The methodological quality was assessed. Pre and post means and SDs for depression specific measures were extracted, when available, for meta-analysis. RESULTS: Seven randomised comparative trials involving 509 patients were included. The evidence is inconsistent on whether manual acupuncture is superior to sham, and suggests that acupuncture was not superior to waiting list. Evidence suggests that the effect of electroacupuncture may not be significantly different from antidepressant medication, weighted mean difference -0.43(95% CI -5.61 to 4.76). There is inconclusive evidence on whether acupuncture has an additive effect when given as an adjunct to antidepressant drugs. CONCLUSION: The evidence from controlled trials is insufficient to conclude whether acupuncture is an effective treatment for depression, but justifies further trials of electroacupuncture.

Nixon, M. K. (2003). An Open Trial of Auricular Acupuncture for the Treatment of Repetitive Self-Injury in Depressed Adolescents. *Journal of the Canadian Academy of Child and Adolescent Psychiatry, 12*(1), 10-12.

Repetitive self-injurious behavior (SIB) is frequently seen in depressed adolescents. In addition to it providing relief for dysphoric symptoms there is evidence of an addictive component to this behaviour. Because auricular acupuncture (AA) has been shown to be effective as an adjunct treatment to cocaine dependence, we wished to test the feasibility and potential efficacy of this treatment in depressed adolescents with repetitive SIB. Our pilot results suggest that AA is an acceptable treatment in this group and that it may be an effective adjunct treatment for repetitive SIB. Moreover, decreases in SIB were evident while depressive symptoms remained unchanged.

Shi, X., Litscher, G., Wang, H., Wang, L., Zhao, Z., Litscher, D., Tao, J., … Sheng, Z. (2013). Continuous auricular electroacupuncture can significantly improve heart rate variability and clinical scores in patients with depression: first results from a transcontinental study. *Evidence-Based Complementary and Alternative Medicine*, *16*(8), 872-874.

Acupuncture needle manipulation gives rise to "needle grasp," a biomechanical phenomenon characterized by an increase in the force necessary to pull the needle out of the tissue (pullout force). This study investigates the hypothesis that winding of connective tissue, rather than muscle contraction, is the mechanism responsible for needle grasp. We performed 1) measurements of pullout force in humans with and without needle penetration of muscle; 2) measurements of pullout force in anesthetized rats, with and without needle rotation, followed by measurements of connective tissue volume surrounding the needle; 3) imaging of rat abdominal wall explants, with and without needle rotation, using ultrasound scanning acoustic microscopy. We found 1) no evidence that increased penetration of muscle results in greater pullout force than increased penetration of subcutaneous tissue; 2) that both pullout force and subcutaneous tissue volume were increased by needle rotation; 3) that increased periodic architectural order was present in subcutaneous tissue with rotation, compared with no rotation. These data support connective tissue winding as the mechanism responsible for the increase in pullout force induced by needle rotation. Winding may allow needle movements to deliver a mechanical signal into the tissue and may be key to acupuncture's therapeutic mechanism.

Wu, J., Yeung, A. S., Schnyer, R., Wang, Y., & Mischoulon, D. (2012). Acupuncture for depression: a review of clinical applications. *The Canadian Journal of Psychiatry*, *57*(7), 397-405.

While increasing numbers of patients are seeking acupuncture treatment for depression in recent years, there is limited evidence of the antidepressant (AD) effectiveness of acupuncture. Given the unsatisfactory response rates of many Food and Drug Administration-approved ADs, research on acupuncture remains of potential value. Therefore, we sought to review the efficacy and safety of acupuncture treatment for depression in clinical applications. We conducted a PubMed search for publications through 2011. We assessed the adequacy of each report and abstracted information on reported effectiveness or efficacy of acupuncture as monotherapy for major depressive disorder (MDD) and as augmentation of ADs. We also examined adverse events associated with acupuncture, and evidence for acupuncture as a means of reducing side effects of ADs. Published data suggest that acupuncture, including manual-, electrical-, and laser-based, is a generally beneficial, well-tolerated, and safe monotherapy for depression. However, acupuncture augmentation in AD partial responders and nonresponders is not as well studied as monotherapy; and available studies have only investigated MDD, but not other depressive spectrum disorders. Manual acupuncture reduced side effects of ADs in MDD. We found no data on depressive recurrence rates after recovery with acupuncture treatment. Acupuncture is a potential effective monotherapy for depression, and a safe, well-tolerated augmentation in AD partial responders and nonresponders. However, the body of evidence based on well-designed studies is limited, and further investigation is called for.

Zhang, Z. J., Chen, H. Y., Yip, K. C., Ng, R., & Wong, V. T. (2010). The effectiveness and safety of acupuncture therapy in depressive disorders: systematic review and meta-analysis. *Journal of Affective Disorders*, *124*(1-2), 9-21.

BACKGROUND: Although acupuncture has been used as an alternative treatment for depressive disorders, its effectiveness and safety are not well defined. The purpose of this systematic review with meta-analysis was to evaluate the effectiveness of acupuncture as monotherapy and as an additional therapy in treating various depressive conditions, particularly major depressive disorder (MDD) and post-stroke depression

(PSD). METHODS: Following systematic review, meta-analysis was conducted on high-quality randomized controlled trials (RCTs). RESULTS: Of 207 clinical studies of acupuncture for various depression retrieved, 113 (54.6%) were on MDD and 76 (36.7%) on PSD. Twenty RCTs of MDD (n=1998) and 15 of PSD (n=1680) identified for high-quality protocol (Jadad score >or=3) were included for meta-analysis. The efficacy of acupuncture as monotherapy was comparable to antidepressants alone in improving clinical response and alleviating symptom severity of MDD, but not different from sham acupuncture. No sufficient evidence favored the expectation that acupuncture combined with antidepressants could yield better outcomes than antidepressants alone in treating MDD. Acupuncture was superior to antidepressants and waitlist controls in improving both response and symptom severity of PSD. The incidence of adverse events in acupuncture intervention was significantly lower than antidepressants. CONCLUSIONS: Acupuncture therapy is safe and effective in treating MDD and PSD, and could be considered an alternative option for the two disorders. The efficacy in other forms of depression remains to be further determined.

Anxiety

Goyata, S. L., Avelino, C. C., Santos, S. V., Souza Junior, D. I., Gurgel, M. D., & Terra Fde, S. (2016). Effects from acupuncture in treating anxiety: integrative review. *Revista Brasileira de Enfermagem*, *69*(3), 602-609.

OBJECTIVE: to evaluate the scientific evidence that is available in the literature on the effects of acupuncture for treating anxiety and on the quality of such studies. METHOD: the study is an integrative review of CINAHL, LILACS, PUBMED-PICO, SciELO, and The Cochrane Library between 2001 and 2014. Keywords anxiety, acupuncture therapy, acupuncture, and anxiety disorders were combined among themselves to ensure a wide search of primary studies. RESULTS: among 514 articles, 67 were selected to be fully read and 19 were included. Among these, 11 were found to have strong evidence levels. Among the six articles about randomized clinical studies, five were found to be of reasonable quality. Two studies used acupuncturist nurses to perform their interventions. Its results showed positive and statistically significant effects from using acupuncture for treating subjects with anxiety. CONCLUSION: acupuncture seems to be a promising treatment for anxiety; however, there is a need for improving the methodological quality of the research on this field.

Havens, J. F., Gudino, O. G., Biggs, E. A., Diamond, U. N., Weis, J. R., & Cloitre, M. (2012). Identification of Trauma Exposure and PTSD in Adolescent Psychiatric Inpatients: An Exploratory Study. *Journal of Traumatic Stress*, *25*(2), 171-178.

Trauma exposure and posttraumatic stress disorder (PTSD), though prevalent among adolescent psychiatric inpatients, are under-identified in standard clinical practice. In a retrospective chart review of 140 adolescents admitted to a psychiatric inpatient unit, we examine associations between probable PTSD identified through the Child PTSD Symptom Scale and adolescents' service use and clinical characteristics. Results suggest a large discrepancy between rates of probable PTSD identified through standardized assessment and during the emergency room psychiatric evaluation (28.6% vs. 2.2%). Adolescents with probable PTSD had greater clinical severity and service utilization, an increased likelihood of being diagnosed with bipolar disorder (27.5% vs. 9.2%) and being prescribed antipsychotic medications (47.5% vs. 27.6%), and were prescribed more psychotropic medications. Upon discharge, those with probable PTSD were more likely to be assigned a diagnosis of PTSD (45% vs. 7.1%), a comorbid

diagnoses of major depressive disorder (30% vs. 14.3%), to be prescribed an antidepressant medication (52.5% vs. 33.7%), and they continued to be prescribed more medications. The under-identification of trauma exposure and PTSD have important implications for the care of adolescents given that accurate diagnosis is a prerequisite for providing effective care. Improved methods for identifying trauma-related problems in standard clinical practice are needed.

Ma, R., Xu, S., Wen, X., Wu, Q., Wu, Y., Huang, Y., & Fu, W. (2014). Acupuncture for Generalized Anxiety Disorder: A Systematic Review. *Journal of Psychology & Psychotherapy*, *4*(5), 155.

Objective: Generalized Anxiety Disorder (GAD) is the most common anxiety disorder in primary care. The clinical studies on anxiety disorders have been commonly conducted; however the efficacy of acupuncture in treating GAD is uncertain. We therefore performed a systematic review to evaluate the evidence regarding acupuncture for GAD. Data sources: CBM, CAJ, CSJD, CNKI, Wan Fang, EMBASE, Pubmed/MEDLINE, OVID EBM Reviewers, Cochrane Library, Up-to-date, ACP journal club were searched through July 2013. Search terms included Condition = (Generalized Anxiety Disorder or Generalized Anxiety or GAD) And Intervention = (acupuncture* or acupressure or acupoint* or electro acupuncture* or electro-acupuncture*). Study selection: Included in this study were randomized controlled trials of participants have GAD diagnosed by operational criteria. Data extraction: Two review authors extracted data from each study independently. Information relating to study population, sample size, interventions, comparators, potential biases in the conduct of the trial, outcomes including adverse events, follow-up and methods of statistical analysis were abstracted from the original reports. Data synthesis: 3 RCTs (443 patients) were included. Overall the risk of bias in included studies was high. The included trials were extremely heterogeneous regarding acupuncture and control interventions. Therefore, pooling of data was not performed. We found equal benefits of acupuncture and medicationsfor HAMA or SAS in 2 trials. In another trail no difference was found in the baseline analysis with HAMA and SAS measurement between groups at the2nd, 4thweek time-point. Adverse events associated with acupuncture are rarely reported. Conclusion: Even though some methodological shortcomings influence the quality of the included studies, this review still suggests that acupuncture was an effective alternative therapy for generalized anxiety is safe.

Pilkington, K. (2010). Anxiety, depression and acupuncture: A review of the clinical research. *Autonomic Neuroscience: Basic and Clinical*, *157*(1-2), 91-95.

Depression and anxiety together constitute a significant contribution to the global burden of disease. Acupuncture is widely used for treatment of anxiety and depression and use is increasing. The theoretical basis for acupuncture diagnosis and treatment derives from traditional Chinese medicine theory. An alternative approach is used in medical acupuncture which relies more heavily on contemporary neurophysiology and conventional diagnosis. Trials in depression, anxiety disorders and short-term acute anxiety have been conducted but acupuncture interventions employed in trials vary as do the controls against which these are compared. Many trials also suffer from small sample sizes. Consequently, it has not proved possible to accurately assess the effectiveness of acupuncture for these conditions or the relative effectiveness of different treatment regimens. The results of studies showing similar effects of needling at specific and non-specific points have further complicated the interpretation of results. In addition to measuring clinical response, several clinical studies have assessed changes in levels

of neurotransmitters and other biological response modifiers in an attempt to elucidate the specific biological actions of acupuncture. The findings offer some preliminary data requiring further investigation.

Sniezek, D. P., Siddiqui, I. J. (2013). Acupuncture for Treating Anxiety and Depression in Women: A Clinical Systematic Review. *Medicine in Acupuncture*, *25*(3), 164-172.

Background Anxiety and depression are high in prevalence, especially in the female population, whose incidence is approximately double that of the male population. In addition, these conditions are difficult to treat and have high relapse rates and medication side-effects. There is evidence to suggest that acupuncture may be an effective treatment modality. Objective The aim of this review is to summarize the existing evidence on acupuncture as a therapy for anxiety and depression in women and to present a novel method for assessing acupuncture trial quality. Methods Published randomized controlled trials were included, whereby acupuncture was compared with any control procedure in subjects with anxiety and/or depression. Two authors extracted data independently. A novel acupuncture trial quality-assessment tool was developed to analyze the literature quality. Results Six articles used the desired inclusion and exclusion criteria. The quality of research varied heavily. Five studies were properly randomized. Three were double-blinded. Three used individualized acupuncture. Four studies were of at least reasonable quality. One was of marginal quality, and one was of poor quality. There was a significant difference between acupuncture and at least one control in all six trials. Conclusions With respect to six reviewed studies, there is high-level evidence to support the use of acupuncture for treating major depressive disorder in pregnancy.

Wang, S., Gaal, D., Maranets, I., Caldwell-Andrews, A., & Kain, Z. N. (2005). Acupressure and Preoperative Parental Anxiety: A Pilot Study. *Anesthesia & Analgesia*, *101*(3), 666-669.

In this randomized sham-controlled study we examined the anxiolytic and sedative effects of acupressure on parents in the preoperative holding area before their children's surgery. Sixty-one parents received acupressure either at the Yintang point (midpoint between the two eyebrows) or at a sham point. Anxiety (as measured by the Stait-Trait Anxiety Inventory), arterial blood pressure, and heart rate were assessed before and after the intervention and a Bispectral Index monitor was used to continuously monitor hypnotic sedation levels. Repeated-measures analysis of variance showed that parents in the acupressure group reported significantly less anxiety at 20 min postintervention as compared with parents in the sham group (37 ± 10 versus 45 ± 13, P = 0.03). Bispectral Index values, heart rate, and arterial blood pressure, however, did not differ between the two study groups (P = not significant). We conclude that acupressure at the Yintang point may be used as a treatment for parental preoperative anxiety. Future studies are needed to quantify the magnitude and duration of the anxiolytic effect.

Epilepsy

He, W., Rong, P., Li, L., Ben, H., Zhu, B., & Litscher, G. (2012). Auricular Acupuncture May Suppress Epileptic Seizures via Activating the Parasympathetic Nervous System: A Hypothesis Based on Innovative Methods. *Evidence-Based Complementary and Alternative Medicine*, *(2012)*, Article ID 615476.

Auricular acupuncture is a diagnostic and treatment system based on normalizing the body's dysfunction. An increasing number of studies have demonstrated that auricular

acupuncture has a significant effect on inducing parasympathetic tone. Epilepsy is a neurological disorder consisting of recurrent seizures resulting from excessive, uncontrolled electrical activity in the brain. Autonomic imbalance demonstrating an increased sympathetic activity and a reduced parasympathetic activation is involved in the development and progress of epileptic seizures. Activation of the parasympathetic nervous system such as vagus nerve stimulation has been used for the treatment of intractable epilepsy. Here, we propose that auricular acupuncture may suppress epileptic seizures via activating the parasympathetic nervous system.

Posttraumatic Stress Disorder

Hollifield, M., Sinclair-Lian, N., Warner, T. D., & Hammerschlag, R. (2007). Acupuncture for posttraumatic stress disorder: a randomized controlled pilot trial. *Journal of Nervous and Mental Disease*, *195*(6), 504-513.

The purpose of the study was to evaluate the potential efficacy and acceptability of accupuncture for posttraumatic stress disorder (PTSD). People diagnosed with PTSD were randomized to either an empirically developed accupuncture treatment (ACU), a group cognitive-behavioral therapy (CBT), or a wait-list control (WLC). The primary outcome measure was self-reported PTSD symptoms at baseline, end treatment, and 3-month follow-up. Repeated measures MANOVA was used to detect predicted Group X Time effects in both intent-to-treat (ITT) and treatment completion models. Compared with the WLC condition in the ITT model, accupuncture provided large treatment effects for PTSD ($F [1, 46] = 12.60$; $p < 0.01$; Cohen's $d = 1.29$), similar in magnitude to group CBT ($F [1, 47] = 12.45$; $p < 0.01$; $d = 1.42$) (ACU vs. CBT, $d = 0.29$). Symptom reductions at end treatment were maintained at 3-month follow-up for both interventions. Accupuncture may be an efficacious and acceptable nonexposure treatment option for PTSD. Larger trials with additional controls and methods are warranted to replicate and extend these findings.

Kim, Y., Heo, I., Shin, B., Crawford, C., Kang, H., & Lim, J. (2013). Acupuncture for Posttraumatic Stress Disorder: A Systematic Review of Randomized Controlled Trials and Prospective Clinical Trials. *Evidence-Based Complementary and Alternative Medicine*, *2013*, Article ID 615857.

To evaluate the current evidence for effectiveness of acupuncture for posttraumatic stress disorder (PTSD) in the form of a systematic review, a systematic literature search was conducted in 23 electronic databases. Grey literature was also searched. The key search terms were “acupuncture” and “PTSD.” No language restrictions were imposed. We included all randomized or prospective clinical trials that evaluated acupuncture and its variants against a waitlist, sham acupuncture, conventional therapy control for PTSD, or without control. Four randomized controlled trials (RCTs) and 2 uncontrolled clinical trials (UCTs) out of 136 articles in total were systematically reviewed. One high-quality RCT reported that acupuncture was superior to waitlist control and therapeutic effects of acupuncture and cognitive-behavioral therapy (CBT) were similar based on the effect sizes. One RCT showed no statistical difference between acupuncture and selective serotonin reuptake inhibitors (SSRIs). One RCT reported a favorable effect of acupoint stimulation plus CBT against CBT alone. A meta-analysis of acupuncture plus moxibustion versus SSRI favored acupuncture plus moxibustion in three outcomes. This systematic review and meta-analysis suggest that the evidence of effectiveness of acupuncture for PTSD is encouraging but not cogent. Further qualified trials are needed to confirm whether acupuncture is effective for PTSD.

Dementia

Rodriguez-Mansilla, J., Gonzalez-Lopez-Arza, M. V., Varela-Donoso, E., Montanero-Fernandez, J., Jimenez-Palomares, M., & Garrido-Ardila, E. M. (2013). Ear therapy and massage therapy in elderly people with dementia a pilot study. *Journal of Traditional Chinese Medicine*, *33*(4), 461-467.

Objective To assess the impact of massage versus ear acupuncture on behavior and participation in occupational therapy of dementia patients. Methods We performed a controlled, randomized longitudinal trial approved by the Bioethics Commission of the University of Extremadura. One hundred twenty elderly subjects with dementia institutionalized in residential homes in Extremadura (Spain) received treatment based on massage and ear acupuncture over three months. Behavior alterations, sleep disturbance, and participation in rehabilitation and eating were assessed every month during the three months of intervention, and at one and two months of follow-up after the end of treatment. The assessment was performed through a structured questionnaire with closed format questions done by an occupational therapist not involved in the study. Results There was a statistically significant positive effect of massage and ear acupuncture ($P<0.001$) on measured variables in the third month of intervention, which were maintained at two months after completing the treatment ($P<0.021$), when compared to the control group. Conclusions Massage therapy and ear acupuncture can improve behavior and sleep disturbances, and increase the participation in eating and rehabilitation organized in residential homes, in dementia patients.

Substance Abuse

Sapir-Weise, R., Berglund, M, Frank, A., & Kristenson, H. (1999). Acupuncture in alcoholism treatment: a randomized out-patient study. *Alcohol & Alcoholism*, *34*(4), 629-635.

Seventy-two alcoholics were treated with acupuncture to the ear in a randomized single-blind controlled design over 10 weeks. Orthodox points and incorrect points 3-5 mm from orthodox points were used. No initial differences were found regarding social characteristics, the responses to the Swedish version of the Alcohol Use Inventory and the Three-dimensional Personality Questionnaire, indicating a successful randomization. There were non-significant tendencies towards gender differential response after acupuncture treatment ($P = 0.07$). There was no difference in the number of drinking days or level of craving between treatment and control patients. Among females, those in the treatment group reported reduction of anxiety after 1 month, more often than those in the control group ($P < 0.05$). Response to acupuncture was not related to personality or drinking pattern. Patients' experience of needle placement was similar in the study and control groups. The effects of acupuncture were less pronounced than those previously reported.

Stuyt, E. B. (2014). Ear acupuncture for co-occurring substance abuse and borderline personality disorder: an aid to encourage treatment retention and tobacco cessation. *Acupuncture in Medicine*, *32*(4), 318-324.

OBJECTIVES: Retention of individuals with co-occurring borderline personality disorder (BPD) and substance use disorders in treatment is known to be difficult. An outcome study of a tobacco-free 90-day inpatient dual-diagnosis treatment programme that uses several evidenced-based treatments in addition to ear acupuncture (acudetox) was

undertaken to determine overall treatment effectiveness. METHODS: Between January 2009 and December 2011, 231 patients were treated in the programme, 88% with nicotine dependence and 79% with personality disorder diagnoses. All patients completing the programme were invited to enrol in a 1-year follow-up study in which they responded to monthly questionnaires to assess outcomes. RESULTS: 185 patients (80%) successfully completed the programme. There was no correlation between successful programme completion and gender, race, age, primary drug dependence diagnosis or primary psychiatric diagnosis. The use of acudetox was positively correlated with successful completion (p=0.006). Of the 78 patients with BPD, 100% of men and 83% of women successfully completed the programme. Their use of acudetox was positively correlated with successful completion (p=0.026). At the end of the year, 140 questionnaires were returned: 51 patients with BPD reported outcomes similar to the group as a whole, with 55% sober and doing well. CONCLUSIONS: The use of acudetox was positively correlated with both successful completion of the programme for those with BPD as well as successful tobacco cessation, which ultimately improves the ability to maintain sobriety.

Wen, H. L., Ho, W. K. K., Wong, H. K., Mehal, Z. D., Ng, Y. H., & Ma, L. (1978). Reduction of Adrenocortiocotropic Hormone (ACTH) and Cortisol in Drug Addicts Treated by Acupuncture and Electrical Stimulation (AES). *The American Journal of Chinese Medicine*, *6*(1), 61-66.

Forty-two heroin addicts and 31 non-addicts were examined for the effect of acupuncture and electrical stimulation (AES) on plasma ACTH, cortisol and cyclic-AMP levels. Both ACTH and cortisol levels were reduced significantly in the addicts after treatment whereas no such significant reduction was observed in the normals. Plasma cyclic-AMP level was not affected in either group. Taken together, results from the present study suggest that the mechanism of AES in the treatment of addiction may have a neuroendocrinological basis. This hypothesis is particularly attractive in view of the isolation of opiate-like peptides from the brain.

Hypertension

Zhou, W., & Longhurst, J. C. (2012). Neuroendocrine Mechanisms of Acupuncture in the Treatment of Hypertension. *Evidence-Based Complementary and Alternative Medicine*, *2012*, Article ID 878673.

Hypertension affects approximately 1 billion individuals worldwide. Pharmacological therapy has not been perfected and often is associated with adverse side effects. Acupuncture is used as an adjunctive treatment for a number of cardiovascular diseases like hypertension. It has long been established that the two major contributors to systemic hypertension are the intrarenal renin-angiotensin system and chronic activation of the sympathetic nervous system. Recent evidence indicates that in some models of cardiovascular disease, blockade of AT1 receptors in the rostral ventrolateral medulla (rVLM) reduces sympathetic nerve activity and blood pressure, suggesting that overactivity of the angiotensin system in this nucleus may play a role in the maintenance of hypertension. Our experimental studies have shown that electroacupuncture stimulation activates neurons in the arcuate nucleus, ventrolateral gray, and nucleus raphe to inhibit the neural activity in the rVLM in a model of visceral reflex stimulation-induced hypertension. This paper will discuss current knowledge of the effects of acupuncture on central nervous system and how they contribute to regulation of

acupuncture on the endocrine system to provide a perspective on the future of treatment of hypertension with this ancient technique.