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President's Message

BY MICHAEL PREBEG, DC

I hope this message finds you well and your practice thriving at year's end. Today, I would like emphasize the deep significance of the pursuit of excellence in the field of acupuncture and related techniques, and its role in advancing our professions and impacting patient care. To this day I have not found a better modality in treating pain with movement disorders. If you are not using acupuncture on almost every patient, you are not getting the full value of your skills.

The CCAA is committed to adding value and knowledge to assist in making acupuncture a larger portion of your practice. In today's information era, there are a lot of self-proclaimed experts whose content has questionable clinical validity. It is hard to differentiate true value and information from mere opinion.

We at the CCAA continue to root ourselves in science and clinical expertise that will directly help you as a practitioner and the patients you treat.

We invigorate each other with passion and community. This year, we have added new board volunteers to help explore methods to update our website community and organize our 2024 symposium on the treatment and diagnosis of lower back disorders. Keep your eyes open for more information coming soon!

Every patient is a gift — it gives us the opportunity to practice our skills and give back. Enjoy each day of practice!

Thank you for your commitment to excellence.

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Does Acupuncture Have a Role in the Treatment of Tension Type Headaches?

BY ADAM BLANCHARD, DC

Tension Type Headaches have been ranked as the second most prevalent health condition worldwide.¹ Tension type headaches can be very debilitating and have significant impacts on an individual's quality of life. Given the prevalence and severity of tension type headaches, there has been an increased focus on finding effective treatment options. Pharmacological management is one of the first lines used for treatment, but are there other effective conservative treatment options available?

A recent systematic review and meta-analysis published by Krøll *et al.* in the Journal of Headache and Pain looked at the evidence for acupuncture and various other conservative treatments on the effect of decreasing headache frequency and improving quality of life.² One randomized control trial was identified regarding the use of acupuncture in the treatment of tension type headaches. Acupuncture was found to potentially have a positive impact on both headache frequency and quality of life.³ Acupuncture was also rated as 79% likely to expectedly reduce the number of headache days out of 360 individuals who took the survey. This was the highest out of various

different conservative interventions including chiropractic, physiotherapy, psychology and education.

Based on the identified benefits, patient preferences and the certainty of evidence, the multidisciplinary expert group of this review concluded that acupuncture can be considered as an appropriate treatment approach for tension type headaches. They state that it should be used in adjunct with medical care and state that individual preferences may also dictate whether it should or should not be used as a line of treatment.

One important thing to note is the randomized control trial assessed in the review was deemed to be of low quality due to risk of bias and imprecision. It is also important to note that this review excluded studies using electroacupuncture as intervention and studies using sham acupuncture with needle insertion. Consideration should be given when generalizing the information in this review across all patient demographics and types of acupuncture. Further studies will help improve the quality and quantity of evidence available.

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The Effect of Electro-Acupuncture on Spasticity of the Wrist Joint in Chronic Stroke Survivors

BY AMRIT SANGHERA, DC

The article titled “The Effect of Electro-Acupuncture on Spasticity of the Wrist Joint in Chronic Stroke Survivors” was published in the *Archives of Physical Medicine and Rehabilitation* in 2007. The study aimed to investigate the effect of electro-acupuncture on wrist spasticity in chronic stroke survivors.

Spasticity is a common complication of stroke and can affect a patient’s quality of life. Electro-acupuncture is a type of acupuncture that involves applying electrical stimulation to acupuncture points. It has been shown to be effective in treating various musculoskeletal disorders, including spasticity.

The researchers conducted a randomized controlled trial involving 40 chronic stroke survivors with wrist spasticity. The participants were randomly assigned to two groups: an electro-acupuncture group and a control group. The electro-acupuncture group received electro-acupuncture treatment twice a week for four weeks, while the control group received conventional rehabilitation treatment.

The results showed that the electro-acupuncture group had a significant reduction in wrist spasticity compared to the control group. The researchers used the Modified Ashworth Scale (MAS) to measure spasticity, which is a widely used tool for assessing spasticity in stroke patients. The MAS scores of the electro-

acupuncture group decreased significantly after treatment, indicating a reduction in spasticity.

The researchers also found that the electro-acupuncture group had a significant improvement in wrist range of motion, hand function, and activities of daily living compared to the control group. The participants in the electro-acupuncture group had greater improvement in grip strength, thumb-index finger pinch strength, and wrist flexion and extension range of motion. They also reported better performance in daily activities such as dressing, grooming, and feeding. The study concluded that electro-acupuncture can be an effective treatment for wrist spasticity in chronic stroke survivors. The findings suggest that electro-acupuncture may be a valuable adjunct therapy for stroke survivors undergoing rehabilitation.

In conclusion, this study provides evidence for the effectiveness of electro-acupuncture in treating wrist spasticity in chronic stroke survivors. This finding is significant because spasticity is a common complication of stroke and can significantly impact a patient’s quality of life. Electro-acupuncture is a non-invasive and low-risk therapy that can be easily incorporated into stroke rehabilitation programs. However, further research is needed to explore the optimal frequency and duration of treatment and the long-term effects of electro-acupuncture.

Mukul Mukherjee, Lisa K. McPeak, John B. Redford, Chao Sun, Wen Liu, The Effect of Electro-Acupuncture on Spasticity of the Wrist Joint in Chronic Stroke Survivors, *Archives of Physical Medicine and Rehabilitation*, Volume 88, Issue 2, 2007, Pages 159-166, ISSN 0003-9993, <https://doi.org/10.1016/j.apmr.2006.10.034>.

Acupuncture: Flipping the Switch on Inflammation

BY ANN SZCZEPANSKI, MSCPT

The body works as a complex interconnected system. A loss of adaptability to this system can be indicated by pain and inflammation, which are some of the indicators for acupuncture.¹ With addition of a nociceptive stimulus (acupuncture needle), a complex array of interactions ensues that affects gene regulation leading to downstream increase of blood flow to affected areas, increase of healing potential and regulation of pain.² Research proposes acupuncture modulates the body's regulatory system, the neuro-endocrine-immune (NEI) network, which results in these changes.² The nervous, immune and endocrine systems communicate via common signalling molecules to coordinate and remodel to meet the body's dynamic homeostasis needs.³

An important component of this system that helps to reduce inflammation is the response of macrophages. There are 2 main subtypes of macrophages: M1, that releases IL-6, TNF-alpha, NO and other molecules necessary for an inflammatory response, and M2, that release IL-10 and other anti-inflammatory molecules.^{1,4} Balance between these systems is essential in the body for a proper tissue healing response. M1 polarization is needed to initiate the signal, but prolonged signalling inhibits tissue repair. M2 polarization is needed to cease inflammation and stimulate tissue remodelling and angiogenesis.⁴ Acupuncture can act as a catalyst to promote a shift in macrophage polarization.⁴

Acupuncture needle insertion triggers a traumatic tissue response resulting in various bio-mechanical changes.⁵ Damage-associated molecular patterns (DAMPs) are released and trigger activation of cells expressing pattern recognition receptors (PPRs) — mast cells, macrophages and leukocytes — which release cytokines and chemokines to attract

more cells to the area.⁶ Epithelial cells also release NO which activates nearby nerves to promote vasodilation of blood vessels, aiding with cell recruitment to the area.^{5,6} Acupuncture (via complex and unclear mechanisms involving the nervous and endocrine systems) also decreases activation of the HPA axis to promote release of glucocorticoids.^{5,7} These glucocorticoids affect the T-cells that cause a polarization from an M1 predominant to M2 predominant response.^{1,4} Research has shown macrophage polarization towards an M2 response can improve outcomes in inflammatory muscle pain disorders, digestive issues, cancer and acute injury.^{8,9,10} Acupuncture can affect the local tissue microenvironment in these conditions to activate cell functions, release chemical substances and excite afferent nerves.² Interaction of these processes can amplify the original effect producing a widespread regulation via complex mechanisms including macrophage polarization.²

Understanding how acupuncture can contribute to regulating the body can help practitioners decide which conditions acupuncture is appropriate for, educate patients, and aid in the development of treatment goals and selection of relevant targets to achieve them. As with anything in life, the more understanding there is of acupuncture mechanisms, the more specific practitioners can be with their target selection. The mechanism presented here is a small piece of the puzzle that is acupuncture regulation; by understanding the small pieces we can put them together and zoom out to better understand the bigger picture of the human body.

There is a complete list of references on page 13.

Case Study: The Use of Neurofunctional Acupuncture in the Treatment of Ankle Sprain

BY MELISSA LORRAINE ARLANTICO, PT

Ankle sprains account for a majority of injuries observed amongst adolescent soccer players, with 77% of ankle injuries in soccer being classified as a sprain.¹ Traditional Western rehabilitation protocols for ankle sprains commonly cite strategies such as semi-rigid ankle bracing, normalization of range of motion and weight-bearing capacity, strength training, neuromuscular training, proprioceptive training, ankle balance/stability exercises, and soccer-specific programming.^{2,3,4} Amongst these rehabilitation protocols, acupuncture is rarely mentioned as a modality for recovery and performance restoration.

A 2013 systematic review and meta-analysis found that acupuncture was an effective adjunct to standard rehabilitation protocols, with findings such as improving pain, facilitating return to activity and promoting quality of life.⁵ However, authors' results were confounded by inadequate randomization, concealment, heterogeneity and high risk of bias in the available studies.⁵ Thus, authors concluded that there was insufficient evidence to support the use of acupuncture in the treatment of ankle sprains. In contrast, a recent 2020 systematic review and meta-analysis concluded that there may be some benefit to acupuncture in the treatment of ankle sprains because when combined with other treatment strategies such as RICE and massage, there was a significant decrease in patient reported pain.⁶ A Cochrane systematic review found that available studies had a high degree of bias and a lack of reporting on patient-reported assessment of function, a key component in athletic return to

sport.⁷ Authors concluded there was a need for more rigorous and large sample size randomized control trials to generate conclusions regarding the effectiveness of acupuncture for treatment of ankle sprains.⁶

This case study examines a 15 year-old female high level soccer player with persistent anterolateral ankle pain 3 months post-injury. The patient was attending physiotherapy to rehabilitate a grade II ATFL and CFL sprain. During this stage of recovery her swelling resolved, range of motion normalized, and gross motor functioning was restored.

Therapeutic goals shifted to return-to-sport activities, particularly developing sound movement patterning in plyometric and agility-type movements and kicking a soccer ball long distance. The patient reported continued pain along the lateral ankle when kicking the ball greater than 20 yards and at the end of soccer games or long runs. Functional testing revealed reduced endurance along anterolateral leg musculature and hip abductors and external rotators.

Following the Neurofunctional Acupuncture approach, a simple acupuncture blueprint was used:

Peripheral Segmental: BL-53, BL-54, GB-30, GB-39, GB-40, ST-38, ST-40

Spinal Segmental: BL-19 to BL-27

Extra Segmental: ST-36, GB-34, LV-3

Stimulation: low-frequency, 12 minutes

Functional testing was re-administered and showed improvement in pain and muscular endurance.

This case demonstrates the effectiveness of Neurofunctional Acupuncture in activating previously inhibited muscle and the importance of functional testing as a clinical indicator of treatment effectiveness; two outcomes unaccounted for in the aforementioned studies. Future studies exploring the use of acupuncture for the treatment of ankle sprain would benefit from distinguishing between different acupuncture methodologies (i.e. Traditional Chinese Medicine versus dry needling versus Neurofunctional Acupuncture) and include functional outcome measures as a means to determine clinical effectiveness.

There is a complete list of references on page 13.

Case Study: Professional Golfer with Lower Back Pain

BY JOSHUA KOLLMANN, DC

Introduction

This case study describes to the reader an example where Neuro Functional Acupuncture (NFA) combined with McKenzie Mechanical Diagnosis and Therapy (MDT) assisted a professional golfer to not only compete but successfully make the weekend cut and improve his FedEx ranking as well as his standings on the money list.

History

The case study took place this past February 2023 at a professional golf tournament in Orlando, FL. The golfer's name shall remain anonymous so I will call him Greg.

Greg presented to the trailer on the first main practice day, Tuesday. On presentation Greg explained he did not believe he would be able to play the week and was contemplating withdrawing from the event. I have worked with this golfer in the past and asked if it was ok for me to perform an assessment. Greg stated his pain on a 0-10 pain scale was at an 8.

His chief complaint was low back pain (LBP) that radiated down into his right glute. Greg explained he had been experiencing these symptoms for the past few weeks. Greg stated he was getting regular chiropractic adjustments at prior tournaments which gave him temporary relief.

Assessment

Standing active range of motion (AROM) testing was first performed. Greg had full spinal flexion without pain. Extension was limited, obstructed, and painful. Greg did not experience

radiating symptoms (sx's) with any AROM testing except for Extension. He had local pain at the L5 level with slight irritation into his right Glute. Active trunk rotation as well as lateral side bending were tested and unremarkable.

Greg had a negative slump test and a negative Valsalva test. Greg presented with a positive supine SLR on the right side. Raising the left leg only produced hamstring tightness, no neural sensations.

I demonstrated to Greg a proper prone press up on the table. I instructed Greg to perform 10 prone press ups (aka Extension in Lying or EIL). EIL was a challenge for Greg. His movement pattern was inconsistent and challenged. Greg described a considerable amount of discomfort from his 10 EIL. He did not report a change in Glute sensation post 10 EIL.

I assured Greg the potential of EIL and how it might benefit his current presentation. I asked if the irritation going into the right glute increased or decreased in either direction. He stated no change. Greg and I worked together through another 30 EIL. Around repetition 17 Greg stated he felt the irritation down into his right glute start to diminish into a dull ache into his low back. At that point my working diagnosis was a Lumbar Derangement.

Treatment

My clinical thought process was to decrease the central nervous system component of his pain, increase cellular metabolism of the lower extremities including the low back, and activate the stabilizing musculature of the pelvis. My tool to accomplish this was NFA. My treatment plan included some manual overpressure with mobilization prone post needling session.

(Continued)

Case Study: Professional Golfer with Low Back Pain

I asked Greg to lay prone on the table. I placed Systemic Regulatory Needles at the following sites: **LI-4, GV-20, LR-3, SP-6, and GB-34**. I placed 40mm needles into the sacral foramen that coordinate with the following points: **BL-31 to BL-34**. I placed 4 50mm needles bilaterally at **T-10 to L-2** with the expected outcome to improve metabolic vascular activity to the low back and lower extremities. 75mm needles were placed bilaterally in **BL-53' and BL-54**. The target tissue was the superior and inferior gluteal nerves.

Two stimulation boxes with a low frequency of 2-5Hz was used in accordance with electroacupuncture (EA) guidelines. A stim lead was hooked up the points at **T-10 to L2** as well as **BL-53' and BL-54**. A lead was also used on **GB-34 and SP-6**, bilaterally.

The treatment stated above was in place on a 15-minute timer. During the 15 minutes I educated Greg on box breathing and how to perform it during the treatment as well as on the course in between shots. I also educated Greg on incorporating extension work into his daily routine. I explained and demonstrated extension in standing (EIS) as an opportunity he can use while on the course.

After the 15-minute NFA needle session, I performed light manual therapy to both hip internal rotators as well as a prone manual extension mobilization.

Post treatment I had Greg perform a standing Pallof Press and banded hip openers. The goal was to load the tissue post treatment

and prepare Greg to attempt to swing a golf club.

Outcome

Post treatment Greg stated "I feel like I can swing a club." He stated his discomfort level was down from the initial 8 to a mild 2. Greg went to the driving range and was able to swing the club. The treatment described above was performed on Wednesday and Thursday. A modified version was performed Friday and Saturday. Greg did not drop out of the tournament and was able to play well and made the cut. The following week at the 5th major, Greg accomplished a top 10 finish.

Conclusion

The purpose of this case study was to provide the readers an actual case involving a professional athlete utilizing the NFA and MDT methodologies. I am a proud chiropractor. I understand the remarkable possibilities that adjustment possesses. It is important for the reader to understand the value of different tools within the toolbox and how or when to utilize each tool.

The Impact of Electroacupuncture on Quality of Life for Patients with Relapsing-Remitting Multiple Sclerosis

BY HARNEET KUKREJA, RMT

Multiple sclerosis (MS) is very prevalent in North America. A recent study published by MS International Federation indicates that out of every 100,000 people, over 280 are living with MS in Canada and the US.¹

MS is thought to be an autoimmune disorder. It is a disease affecting the central nervous system, in which the myelin sheath that protects nerve fibers is destroyed by the body in an unpredictable manner. Once this demyelination occurs, lesions are formed that cannot conduct electrical impulses in the same way as a healthy, fully myelinated nerve.²

A study conducted at the University of Campinas Hospital in Brazil from 2008 to 2010 examines the effects of electroacupuncture on the quality of life of Relapsing-remitting multiple sclerosis (RRMS) patients.³ All 31 patients included in the study were taking a self-administered daily injection of interferon beta 1-a or interferon beta 1-b, a conventional treatment/immunomodulator for MS, which continued to be taken throughout the study.

Points administered bilaterally were: ST-36, SP-6, LI-4, LI-11, and a 9th needle at the traditional

insertion site Yintang (GV 29). These points (asides from GV 29) were electrically stimulated at 4 Hz.

In order to determine the effects of electroacupuncture, a control group was created, receiving “sham electroacupuncture” (SEA). In this group, needles were inserted superficially (less than 0.2 cm), and were not inserted at the actual point locations themselves. No electrical stimulation was given to the SEA group. In comparison to this control group, patients that received the electroacupuncture (EA) treatment reported improvements such as better sleep, appetite, reduced incontinence and constipation. Although fatigue levels did not show a significant difference between the two groups, EA improved various aspects of quality of life, including a reduction in pain and depression. A final interesting point to note, is that the progression of the disease in regards to reduction in mobility, over the 6 month period of the study, appeared to have slowed down for those receiving EA, in comparison to those receiving the sham acupuncture treatment.

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Efficacy and Safety of Acupuncture Treatment on Primary Insomnia

BY SAHIB GILL, DC

Primary insomnia is a sleep disorder that is not caused by another medical condition or substance use. This study conducted a randomized control trial to investigate the efficacy and safety of acupuncture treatment on primary insomnia.

Seventy-two participants were randomly assigned to either an acupuncture treatment group or a control group. The acupuncture treatment group received a total of 36 sessions of acupuncture over a period of 12 weeks. The control group did not receive any acupuncture treatment.

The acupuncture treatment group received acupuncture at seven acupoints, including DU20 (Baihui), EX-HN3 (Yintang), ST36 (Zusanli), ST37 (Shangjuxu), SP6 (Sanyinjiao), ST25 (Tianshu), and LR3 (Taichong). The needles used were 40 mm in length and 0.30 mm in diameter and the depth of insertion was determined based on the standard permissible depth of insertion for each acupoint. The needles were maintained for 30 minutes in each session and were manipulated twice every 10 minutes with intermittent stimulation. Each manual performance lasted for 10 seconds. The participants in the acupuncture treatment group received acupuncture 3 times per week.

The primary outcome measure was the Pittsburgh Sleep Quality Index (PSQI), which is a self-rated questionnaire that assesses sleep quality and disturbances over a one-month time interval. Secondary outcome measures included the

Insomnia Severity Index (ISI), the Hamilton Anxiety Scale (HAMA), the Hamilton Depression Scale (HAMD), and the World Health Organization Quality of Life-Brief Version (WHOQOL-BREF) questionnaire. The results of the study showed that after 12 weeks of treatment, the acupuncture group had a significant improvement in PSQI scores compared to the control group. Additionally, the acupuncture group had significant improvements in ISI scores, HAMA scores, and WHOQOL-BREF scores compared to the control group. The acupuncture group did not have any significant changes in HAMD scores compared to the control group.

The study concluded that acupuncture treatment is effective and safe for improving sleep quality and quality of life in patients with primary insomnia. The study also suggested that acupuncture treatment may be beneficial for reducing anxiety symptoms in patients with primary insomnia. However, further studies with larger sample sizes and longer follow-up periods are needed to confirm these findings.

Yin, X., Gou, M., Xu, J., Dong, B., Yin, P., Masquelin, F., Wu, J., Lao, L., & Xu, S. (2017). Efficacy and safety of acupuncture treatment on primary insomnia: a randomized controlled trial. *Sleep Medicine*, 37, 193–200. <https://doi.org/10.1016/j.sleep.2017.02.012>

Efficacy and Safety of Acupuncture in Children: An Overview of Systematic Reviews

BY ALEX WU

This article presents a comprehensive summary of existing systematic reviews on the effectiveness and safety of acupuncture in children. The authors conducted a thorough search of electronic databases to identify 17 systematic reviews that fulfilled their inclusion criteria. These reviews covered various pediatric conditions such as pain, asthma, gastrointestinal disorders, and neurological disorders.

The authors concluded acupuncture has shown promising efficacy in the treatment of cerebral palsy (CP), nocturnal enuresis, tic disorders, amblyopia, and pain reduction. However, its efficacy in hypoxic ischemic encephalopathy, attention deficit hyperactivity disorder, mumps, autism spectrum disorder (ASD), asthma, nausea/vomiting, and myopia remains unclear. Acupuncture has been found to be ineffective in treating epilepsy. Although only six reviews reported adverse events (AEs), no fatal side effects were reported. The authors suggest that healthcare professionals should consider acupuncture as a potential treatment option for pediatric patients, particularly when other treatments have failed or are not well-tolerated. However, many of these reviews noted the need for additional high-quality studies to confirm the efficacy of acupuncture for the various pediatric conditions. The authors emphasized the importance of conducting further research to establish the efficacy and safety of acupuncture in children.

In summary, this article provides an overview of the available evidence regarding acupuncture's effectiveness and safety for children with a variety of medical conditions. There is a need for more high-quality research in this field to determine the potential benefits and risks of acupuncture for children, as well as recommendations for effective acupuncture points and protocols for specific conditions.

Yang, C., Hao, Z., Zhang, LL. et al. Efficacy and safety of acupuncture in children: an overview of systematic reviews. *Pediatr Res* 78, 112–119 (2015). <https://doi.org/10.1038/pr.2015.91>

Acupuncture for Frozen Shoulder

BY KINGSLEY WU, PT

Frozen shoulder, also known as adhesive capsulitis, affects 2-5% of the population and is most prevalent in those over the age of 50. Treatment strategies including physiotherapy, laser therapy, steroid injections, and other treatments are utilized to alleviate the restrictions of adhesive capsulitis. Although acupuncture is commonly used to treat adhesive capsulitis, there are significant inconsistencies in the research about its efficacy. As a result, Ben-Arie et al. (2020) conducted a systematic study to assess the efficacy of acupuncture for adhesive capsulitis.

Through their research, the writers looked at thirteen studies. They found that these studies showed that acupuncture significantly reduced pain, improved shoulder function, and increased shoulder flexion ROM. The most commonly used acupuncture points in these investigations were **LI-15 and TH-14**, which were thought to increase local blood circulation and alleviate shoulder discomfort. It should be noted that several of the studies did not give a consistent or valid measurement for their variables, as well as sufficient randomization. The review study indicated that acupuncture can be a safe and effective therapy strategy for restoring shoulder function, discomfort, and range of motion for the short and mid-term; however, further large-scale RCTs are needed to further examine the benefits of acupuncture on frozen shoulders.

Ben-Arie, E., Kao, P.-Y., Lee, Y.-C., Ho, W.-C., Chou, L.-W., & Liu, H.-P. (2020). The effectiveness of acupuncture in the treatment of frozen shoulder: A systematic review and meta-analysis. *Evidence-Based Complementary and Alternative Medicine*, 2020, 1–14. <https://doi.org/10.1155/2020/9790470>

Electroacupuncture and its Effect on Bone Stimulation in Post Menopausal Osteoporosis

BY SONIA ROSATELLI, PT

Recently my osteoporotic mother suffered a fall resulting in a comminuted fracture to her right distal tibia and fibula requiring surgical intervention. Ouch! She is currently casted above the knee and is non-weight bearing; which is gradually causing a loss in muscle mass and bone density amongst other markers of well-being and quality of life. The sooner her bones begin to show signs of healing, the better!

My emerging interest and studies in the Contemporary Acupuncture Program at McMaster University has revealed that electroacupuncture (EA) proves useful for a multitude of health-related issues. Could EA also improve the rate of bone healing in a post-menopausal female? I set out to find the answer.

Let's start with a basic understanding of bone remodeling and osteoporosis (OP). Bone remodeling is the process by which osteoclast resorption of old or damaged bone is complemented by osteoblast deposition of new bone. Osteoporosis is the most common skeletal metabolic disorder. Post-menopausal osteoporosis (PMOP) results from estrogen deficiency and decreased ovarian function and is characterized by low bone mass, micro-architectural bone tissue deterioration, and increased risk of fracture. Estrogen deficiency in PMOP induces osteoblast dysfunction, age-related reduction in osteoblasts relative to demand, as well as increased osteoclast activity.

A review of 4 studies found in the literature suggest that EA is effective as a treatment modality to improve bone health. All studies were performed on ovariectomy (OVT) induced osteoporosis (OP) in rats as this is the well-established model of OP.

In a Chinese study in 2015, several positive results were noted, including: a reduction in body weight, prevention of the increase in the bone resorption marker uDPD, an increase in the bone formation marker sBAP, and recovery of micro-architecture.

Research published in *Molecular Medicine Reports* demonstrated that EA improved the osteoporotic morphological changes that occurred in rats, increased serum ALP (alkaline phosphatase) and BGP (bone gla protein), both markers of improved bone metabolism, increased bone mineral density and activated the Wnt-B-catenin signaling pathway which promotes osteoblast proliferation and differentiation.

Another study using EA on OVT induced OP in rats revealed that EA upregulated OPG (osteoprotegerin) which inhibits osteoclast formation and the activation of mature osteoclasts, downregulated RANKL (receptor activator of nuclear factor kB ligand), which promotes osteoclast formation and Wnt-B-catenin signaling pathways, therefore alleviating OP induced by OVT.

Last but not least, a systematic review and meta-analysis of 11 RCT (randomized controlled trials) involving 731 participants revealed EA successfully decreased serum beta-CTX levels which is a marker for bone resorption.

As relevant and important as this is to me, the benefit of EA on bone health in PMOP has a tremendous impact on society as a whole and our health care system. Worldwide there are 9 million patients with osteoporosis fractures annually. Many require hospitalization, most use medications and some use alternative therapy including physiotherapy and acupuncture. Hospitalization sometimes leads to an overall reduction in the quality of life and medicines such as estrogen, bisphosphonates and calcium have side effects including breast cancer, cardiovascular disease and cerebrovascular diseases.

(Continued)

A review of the literature reveals that EA proves to be a useful adjunct to the treatment and prevention of PMOP.

It should be noted that this review remained limited to the effect of EA on PMOP, however, EA has also been shown to improve bone stimulation post fracture in general populations. A review of the literature surrounding this hot topic is forthcoming. Stay tuned!

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11 King Street West, Suite C120

Toronto, Ontario M5H 4C7

(416) 937-1826

www.contemporaryacupuncture.ca



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