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Mini Review

TCM4.0: Why Acupuncture and Photobiomodulation Are a Perfect Marriage

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Abstract

Traditional Chinese Medicine (TCM) has gone through changes and evolutions with impacts on human health similar to the industrial revolutions on human lives. The author coined the latest version as TCM4.0, which integrates acupuncture with Photobiomodulation (PBM) therapy. The therapeutic benefits of acupuncture have been proven over thousands of years and have become a part of the universal healthcare system. Although PBM therapy is relatively new, the scientific evidence of PBM presented in the last twenty years on illness and disease treatments cannot be ignored. Modern acupuncturists mostly see chronic pain and ailments, and integrating PBM with acupuncture can superiorly enhance the treatment outcomes. The author reviewed his published paper on the treatment of chronic shoulder tendonitis to emphasize the effectiveness of the integrative method. It is the author's opinion that acupuncture and PBM therapy together are a perfect marriage.

Keywords: Chronic Supraspinatus Tendonitis Pain; Laser Acupuncture; Photobiomodulation; Traditional Chinese Medicine

During the late 18th and early 19th centuries, the first industrial revolution (IR1.0) used water and steam power to mechanize production had helped modernize Europe. The Second Industrial Revolution (IR2.0) used electric power to create mass production of goods in the late 19th and early 20th centuries and computers gave rise to the automatic factory in the second half of the 20th century. The Third Industrial Revolution (IR3.0) from the late 20th century to the early 21st century was based on the advancement of computer and information technology to form a system architecture called the Internet that revolutionized mass communication, mass media, and commerce by allowing various computer networks around the world to interconnect. Then, built on IR3.0, came the Fourth Industrial Revolution (IR4.0) now we are living with daily, which is the digital revolution that has been occurring since the end of the last century, characterized by a fusion of various technologies, and is blurring the lines between the physical, digital, and biological spheres such as Artificial Intelligence (AI) and human-like robots. Electric cars many people are driving now are an example of the fusion of AI and automobile-like robots.

In my opinion, Traditional Chinese Medicine (TCM) has gone through changes and evolutions with impacts on human health similar to the industrial revolutions on human lives. About 4000 years ago to the 4th century, the earliest acupuncture devices were invented with sharpened stones, bones, or bamboo to stimulate acupuncture points and helped develop elaborate meridian systems to lay the TCM foundations. I coined the period TCM1.0. Around the 4th century, TCM2.0 began with Chinese acupuncture practitioners experimenting with bronze, copper, tin, gold, and silver metals to puncture the skin. Eventually, steel became the favored material for acupuncture needles. Since the 1950s, acupuncture needles have been made of stainless steel in China, making them flexible and preventing them from rusting or breaking to improve safety and durability. Then these needles became sterile and disposable to prevent cross-contamination and mass-produced to lower the cost. Because of the needle material evolution, acupuncture therapy then became widely acceptable and accessible in the US and Europe in the 1980s. This golden period for TCM popularity in the West was TCM3.0. Then in 1999 I encountered and learned about laser acupuncture and soon later photobiomodulation (PBM), these two modalities changed my life and my private TCM practice forever. The perfect marriage of the two therapies is what I call TCM4.0.

When integrating PBM and acupuncture in one therapy as an integrative medicine model, whether a PBM device placed on the acupoints, or a PBM device near the acupuncture needles, in my opinion, is the biggest evolution in TCM since the invention of the sterile stainless steel needle because its science and the practical applications of laser acupuncture give acupuncturists the edge in modern healthcare.

In 1999 while I was still in a TCM college I read a published laser acupuncture study by Dr. Margaret Naeser [1]. She used laser acupuncture successfully to heal nerve pain from carpal tunnel syndrome. Soon after I visited her in Boston, and later she mentored me for my first published article, "Laser Acupuncture Primer" in the California Journal of Oriental Medicine (CJOM) 2001 Spring issue, and my second follow-up article, "Treatment of Carpal Tunnel Syndrome with Laser Acupuncture" in CJOM's 2001 Summer issue. As a renowned neurological researcher and a licensed acupuncturist, Dr. Naeser has published many research studies in the last two decades on PBM therapy on brain disorders such as epilepsy, Chronic Traumatic Encephalopathy (CTE), Post-Traumatic Stress Disorder (PTSD), Traumatic Brain Injury (TBI), stroke-aphasia, and dementia. One of her latest published papers titled "Transcranial Photobiomodulation Treatment: Significant Improvements in Four Ex-Football Players with Possible Chronic Traumatic Encephalopathy" concluded transcranial photobiomodulation (tPBM) significantly improved CTE subjects' cognitive tests and behavior/mood ratings [2].

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A joint global summit in photobiomodulation science and applications was held virtually in October 2021 [3]. The international conference, PBM2021, was sponsored by the North American Association for PhotobiomoduLation Therapy (NAALT) and the World Association of PhotobiomoduLation Therapy (WALT). I consider this conference to be the most significant review of PBM as a medical modality in the past 20 years since I became a member of NAALT in 2001 and its president from 2008 to 2010. During the conference's laser acupuncture session, I presented two research reports. The first report was on treating both chronic soft-tissue pain in the knee with a unique clinical technique I developed that utilizes acupuncture and photobiomodulation therapy, and severe arthritis pain in the knee using laser acupuncture. My second report was on the treatment of peripheral neuropathy in the feet with acupuncture and photobiomodulation therapy (detailed in my article, "Three-Part Integrative Approach for the Treatment of Peripheral Neuropathy," published in the October 2021 issue of Acupuncture Today).

At this summit, I co-chaired the laser acupuncture session with Dr. Volkmar Kreisel of Germany. Dr. Kreisel is chairman and founding member of the College of Photobiomodulation Therapy and the co-author of a textbook on laser acupuncture. I first met Dr. Kreisel when he presented a lecture on using laser acupuncture for the treatment of macular degeneration at a 2013 PBM conference in Germany, where he also showed me many clinical applications of laser acupuncture in the book he wrote. At that moment, I realized that laser acupuncture had the potential to play a major role for future acupuncturists in the integrative medicine model.

One of my most successful clinical integrative treatment protocols to completely heal chronic soft tissue injury pain is to integrate acupuncture with photobiomodulation and several other alternative therapies. I published a paper titled "Chronic Supraspinatus Tendonitis Pain - An Integrative Approach for Treatment with Cross-Fiber Massage, Electroacupuncture, Far-Infrared Heat, and Photobiomodulation" with Medical Acupuncture's Special Issue Laser Acupuncture, August 2022 [4]. In this paper, I pointed out that acupuncture and standard TCM modalities, such as moxibustion, cupping, and tuina massage, often work well to relieve pain in the acute phases of soft-tissue injuries, but ineffective to completely heal chronic pain. Many American acupuncturists see chronic pain patients after all allopathic modalities have been utilized and failed to heal them. Afterward, typical acupuncture and Chinese medical techniques may not be effective in treating these injuries when they reach the chronic stage. A 2022 published study by Parisien et al., confirmed why initial acute pain later becomes chronic after taking anti-inflammatories [5]. The study found transient neutrophil-driven upregulation of inflammatory responses, to be protective against the transition to chronic pain. This study concluded that, despite analgesic efficacy at the early time of an injury, management of acute inflammation with NSAIDs may be counterproductive for long-term outcomes. Therefore, a new integrative TCM approach is needed to treat these chronic pain patients more effectively since many go to acupuncturists as their last resort.

The article described how an integrative approach may solve the dilemma by focusing on a combination of clinical modalities that integrate osteopathic cross-fiber massage, microcurrent electroacupuncture, far-infrared heat, and photobiomodulation to break up the scar tissue and reactivate the body's intrinsic repair mechanism. Chronic shoulder pain, associated with supraspinatus tendonitis is used in the paper, to illustrate this integrative treatment in an acupuncture clinic setting. This method completely heals chronic pain from an injury with clinic visits, twice per week, for 3–5 weeks.

The cross-fiber massage is used to break up scars and adhesions and prepare tissue for microcurrent Ashi acupuncture therapy. Ashi acupuncture performed with needles may restart the healing process by producing tiny ''puncture wounds'' when healing is incomplete or interrupted by the use of NSAIDs, cortisone injections, and/or icing. PBM therapy is a noninvasive, pain-free, light-based therapy that uses red (630–670nm) or near-infrared (810–904nm) electromagnetic energy to target inflamed and injured tissues. Photons stimulate adenosine triphosphate (ATP) production, thereby accelerating the healing process. PBM therapy increases the flow of oxygenated blood to the injured tissue to accelerate tissue healing. This therapy promotes collagen production by properly aligning and re-modeling collagen to help reduce internal scar formation and enhance tissue elasticity. Most importantly, PBM therapy helps increase inflammatory mediators, such as macrophages, neutrophils, and lymphocytes, to accelerate and resolve the inflammatory process quickly. Last, far-infrared heat therapy is applied over the treatment area to stimulate deep muscle relaxation, increasing blood circulation, and promoting faster healing.

It is crucial to develop an integrative model to treat modern-day complex medical issues, especially chronic musculoskeletal and neurological pain. PBM offers an array of benefits as an alternative therapy that can easily be combined with acupuncture to accelerate the healing process. Patients recover from musculoskeletal and peripheral nerve injuries with less scar tissue, cell regeneration, and improved function.

Consistent research shared during the PBM2021 conference showed evidence that photobiomodulation increases the output of oxygenated blood to the injured tissue to promote healing and resolve inflammation by incrementing the number of inflammatory mediators such as macrophages, neutrophils, and lymphocytes. Furthermore, based on studies on neuromodulation, applied PBM promotes neuronal sprouting and myelin formation for optimal nerve regeneration.

This therapeutic approach can undoubtedly provide successful results in combination with acupuncture and TCM. Acupuncture is known to balance the body's energy, and unblock chronic qi stagnation and blood stasis where patients experience pain. This action activates the inherent healing properties of the organism by unblocking the meridians and moving the blood, while PBM accelerates the activated healing process.

It is a perfect marriage when acupuncture, a time-proven ancient healing art that activates innate healing mechanisms, with PBM therapy, an evidence-based modern healing technology that quickens and enhances the healing, resolves many challenging medical conditions modern acupuncturists face every day. I hope that PBM will soon be taught nationally in all acupuncture schools to offer future acupuncturists an additional resource and therapeutic tool for their future successful practices.

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