Dynamic Chiropractic

Magnetic Resonance: Impact on Cell Function

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The use of magnetism in medicine is recorded in the history of most civilizations. The first usage is noted in Chinese writings (approximately 2000 B.C.), referencing the use of magnetism in conjunction with acupuncture. Cleopatra is said to have worn a lodestone on her forehead to prevent aging.

Long ago, the Earth was surrounded by a much stronger magnetic field than it is today. Scientists have observed a decline in its strength over the past 155 years. They have also discovered, from studying ocean floor samples, that higher vertebrates have died out due to the decline. The effects of this decline on human health were discovered when astronauts experienced bone-calcium loss and muscle cramps as a result of being distant from the Earth's magnetic field for an extended time. When artificial magnetic fields were placed in the space vessels, the astronauts maintained their health.

Healthy cells generally have trans-membrane potentials of approximately 70 millivolts. These potentials are considerably lower in aged and diseased cells due to the alterations of structure, making them unable to function normally. Restoration of the original potentials enables aged or damaged subcellular structure to regain their function.

In the late 1950s, magnetic-field deficiency syndrome was identified in Japan. It resembles chronic fatigue syndrome, with symptoms including fatigue, dizziness, general aches and pains, and frequent headaches. These symptoms were alleviated by the external application of a magnetic field to the human body. Even today, athletes use metal, magnets and electric shocks in various ways to enhance their performance and alleviate pain. Golfers wear copper bracelets, claiming it stops arthritis from hindering their game. Golfers and baseball pitchers tape magnets to their arms to boost blood flow and ameliorate pain. During breaks in a game, athletes often relieve their soreness with electric shocks. Electro-stimulators send helpful charges to the muscles and joints.[1-10]

Chiropractic and Magnetic Therapy: The Mutually Advantageous Synergy

Dr. Daniel D. Palmer, founder of modern chiropractic, began his career as a magneto-therapist. He understood that magnetic forces restore balance, harmony and alignment to living systems at fundamental levels of structure and function, providing basis for the natural restoration of homeostasis.[2,6,9]

The essential feature of chiropractic is the adjustment by hand of any and all luxations of the articular joints of the body; more especially the articulations of the spinal column for the purpose of freeing impinged nerves, which cause strain, imbalance and deranged function. Even a slight displacement of the vertebrae causes electromechanical interference with the spinal cord and nerves, impairing electrochemical conduction mechanisms required for coherent communications between the brain and end organs. Severe cases like brachial neuritis, disc protrusions, bulging / slipped / herniated or ruptured discs, sciatica and torticollis may present with acute pain and inflammation.

When the patient suffers an acute phase, it is often difficult to manipulate the displaced structures. Forces exerted when one body part presses on, pulls on, pushes against or tends to compress or twist another body part produces deformations and strain that can be physical, chemical and emotional. The tension and anxiety enhances stiffness, rigidity, pain and swelling.

Recent studies at the University of Oklahoma Health Sciences Center have revealed that naturally occurring, biologically intrinsic, picoTesla pulsed electromagnetic fields (pT PEMFs) enhance parasympathetic function at specified intensities and extremely low-level frequencies.[7-8] More specifically, stress adversely affects the autonomic nervous system, which innervates smooth and cardiac muscles, as well as glands. The visceral nervous system is a major component of the autonomic nervous system (ANS). The ANS functions automatically, below conscious levels, but is influenced by stress, physical or emotional. The ANS and central nervous system (CNS) interact through centers within the hypothalamus, brain stem and spinal cord, integrating the brain's cortex and limbic systems with visceral inputs and the rest of the ANS activity.

What's more, parasympathetic stimulation maintains body functions under quiet, day-to-day living conditions. It decreases heart rate, promotes digestion and absorption of food, promotes regular heart rhythm, normal sleep patterns and kidney function, and enhances feelings of relaxation, promoting reduction of pain, tension, anxiety and strain. Therefore, pT PEMF therapy used to modulate ANS function is an efficient and safe synergistic modality to assist the chiropractor in the performance of their vital function, addressing conditions of acute stress, pain, stiffness and inflammation.[1,3,5-10]

Why Does Magneto-Therapy Work?

Albert Einstein said that all matter is composed of condensations of electromagnetic field: fundamental elementary electric charges. Clerk Maxwell, the father of modern electromagnetic theory, said that all moving electrical charges have associated magnetic fields, and all pulsed magnetic fields induce the movement of electrically charged particles. In his famous 1905 paper on Brownian motion, Einstein pointed out that the elementary particles comprising all matter are incessantly in motion. Simply stated, everything in the universe is electromagnetic in nature, and all bodies are always moving through space and time.

Our Earth is a magnet, and as all living systems move upon its surface, electricity is induced within the cells. These electrical currents produce intrinsic magnetic fields. Additionally, molecules, trace metals and cells within circulatory systems move incessantly through bodies, further inducing magnetic fields. And all the molecules of living systems are incessantly vibrating, once again inducing production of magnetic fields. Indeed, all life on Earth evolved within a sea of electromagnetic energies, including solar radiation and electrical storms.[2]

The hierarchy of organ systems, tissues and cells must always maintain functional integrity. Each cell is composed of subcellular organelles, which are made of atoms, and retains further smaller particles such as nucleons (protons, neutrons) and electrons that act like tiny magnets. Remember, when a neutron is split apart, a proton and an electron come out. These permanently spinning magnets make up all matter, and the electromagnetic force holds atoms together.[2,6,9]

Recognizing that atoms are magnets of almost all space and that electromagnetism holds atoms together, it is reasonable to conclude that manipulation of them by means of electromagnetic resonance will alter their state – and consequently the function of the cells. Resonance is a condition wherein a vibrating system (including atoms, molecules and cells) responds with maximum amplitude to an alternating driving force. The condition exists when the frequency of the

driving force (or amplitude) coincides with the natural oscillatory or vibrating frequency (or amplitude) of the system.

When the atoms of a living system are altered by natural electromagnetic fields, a balance and homeostasis may return to the structure being treated. The restructuring of critical molecules, cells and tissues, through atomic manipulations with resonant energies may result in the improvement of symptoms, derived from renormalization of magnetic profiles of elementary electrically charged particles.[2-6,9]

Cutting-Edge Research Advances in Magneto-Therapy

David Cohen of MIT was the first to use a superconducting quantum interference detector (SQUID) to measure the normal magnetic fields emanating from the human brain and heart. He found that these naturally occurring magnetic fields were in the picoTesla range, much weaker than the Earth's magnetic field. This is quite logical because the Earth is composed of so many more atoms than we are.

Further advances by Barker and Sheffield were reported in *Lancet* in 1985, when they magnetically stimulated the human motor cortex. Various output waveforms, coil designs and techniques for providing trains of pulses were then used for therapy in rehabilitation, sports medicine, and in the treatment of psychiatric disorders.[1,2,4-6]

In 1989 a seminal clinical paper was published by the *International Journal of Neuroscience*, reporting the successful use of picoTesla magnetic fields in the treatment of epilepsy. Photios Anninos of the Democrition University of Thrace, Greece, confirmed the predictions calculated with Jacobson Resonance Theory, announced 10 years earlier. After substantiating that pT PEMFs were physiologic, rigorous scientific studies ensued.[5]

PicoTesla PEMFs have been shown to regenerate peripheral nerves in mice. Professor Anjali Saxena, neuroscientist and principle investigator at Fairleigh Dickinson University, said, "After replicating the studies executed at the Weill Medical College of Cornell University, spearheaded by Professor Brij Saxena (Director of Reproductive Endocrinology), we can say with certainty that these results are the first to demonstrate a biological effect of low level EMFs in vivo on the restoration of subcellular structures required for nerve impulse conduction and metabolism in nerves; and consequently a grip strength recovery from motor neuropathy under controlled experimental conditions."[6]

Studies executed at the Arrhythmia Research Institute, at the University of Oklahoma Health Sciences Center, by Professor Benjamin Scherlag revealed that pT PEMFs, externally sourced, profoundly regulated the autonomic function of the heart in dogs. Professor Scherlag, a world-renowned research pioneer in heart electrophysiology, said, "Pulsed low level EMFs in the pico Tesla range, applied to the dissected vagal trunks or non-invasively across the chest, can significantly suppress atrial fibrillation caused by sustained AF; as a result of parasympathetic stimulation. These low level EMFs also manifest a profound effect on heart rate and A-V conduction."[7]

The effects of pT PEMFs also were studied on open and sutured wounds in rats at Mississippi State University. According to Professor John Lamberth, "Exposure to pico Tesla range EMFs caused no adverse effects on clinico-pathologic, histologic or bacteriologic variables. PT EMFs represent a safe form of adjuvant treatment for wounds, improves strength of sutured wounds, and speeds

contraction of open wounds."[10]

In addition, pT EMFs were shown to modulate electrical potentials of spinal-cord neurons in rats at the University of Oklahoma Health Sciences Center. Said Professor Robert Foreman, chairman of physiology: "Results showed pT EMF stimulation of cardiac nociceptors stimulated with noxious chemicals can modulate noxious afferent input that innervates spinal neurons. These neurons might participate in the processing of noxious information, and transmitting the information to areas of the brain that interprets the stimulus as pain of angina pectoris. This new type of therapy may have a profound effect on the future of medicine by giving patients relief from their angina pain, and at the same time helping to improve cardiac function."[8]

Furthermore, after a double-blind, randomized, placebo-controlled clinical study, Dr. Olga Klepitskaya of the University of Colorado, stated, "Low level pico Tesla EMFs may improve motor and non-motor features of Parkinson's disease beyond that achieved with standard medical therapy. These effects are long lasting."[3]

Double-blind, randomized and placebo-controlled clinical studies, under the auspices of Institutional Review Board scrutiny, were also conducted at five outpatient facilities. They revealed that picoTesla-range pulsed electromagnetic field therapy significantly reduced the pain and stiffness caused by osteoarthritis and fibromyalgia. No adverse events were reported by any of the more than 100 subjects in experimental groups.[9]

Finally, more than 12,000 documented treatments have been provided to patients since 2007, with no significant risk factors noted. In short, picoTesla-range magneto-therapy has proven to be a viable, safe, non-invasive and natural modality to be utilized as a synergistic complement to chiropractic care.[1-10]

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