Scientific Evidence in Support of Acupuncture and Meridian Theory: I. Introduction

Description

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Acupuncture is a therapeutic modality used in China as early as the late stone age. Throughout Chinese history both acupuncture theory and practice has steadily evolved into an increasingly rich and complex system, eventually offering treatments for virtually every form of medical condition. Much of the history of the development of acupuncture therapeutics can be seen in the evolution of the needles themselves, but the meridian system is of primary importance, and the conceptualization of the system has changed very little in the last 2000 years (Figs. 1 and 2).

Acupuncture has long been considered more important then herbal pharmacology. The earliest classical books on traditional Chinese medicine discuss Acupuncture and do not discuss herbal pharmacology. These include Huangdiâ€™s Internal Classic (ca. 100 B.C.E.) and two other works that pre-date it, the Moxibustion Classic with Eleven Foot-Hand Channels and the Moxibustion Classic with Eleven Ying-yang Channels, both of which were discovered during the Mawangdui tomb excavations in 1973. [1] There is even a traditional saying: â€œfirst you use the needle (acupuncture), then fire (moxibustion), and then herbs.â€•

A traditional diagram of the meridians along on the front of the body
Figure 1: A traditional diagram of the meridians along on the front of the body

Acupuncture did not enter modern Western consciousness until the 1970â€™s when China ended a period of isolation and resumed foreign political and cultural contacts. In 1972 the respected New York Times columnist James Reston underwent an emergency appendectomy while in China. He latter wrote about acupuncture treatment for post-operative pain that was very successful. This report attracted attention and many American physicians and researchers went to China to observe and learn acupuncture techniques.

It appeared as though Acupuncture was used to treat everything in China, but the number of accepted acupuncture applications has grown very slowly in the West. The first area of partial acceptance was in analgesia, which is still the area where its effectiveness is best documented [2]. Acupuncture research has since become a very broad, active area both in Asia and the West. Research at the Shanghai Institute has demonstrated acupunctureâ€™s effect on various biological systems, including the digestive tract, cardiovascular system (helpful in hypotensive states), immune system (phagocytosis), and the endocrine system (the secretion of ACTH, oxytocin, vasopressin, norepinephrine, follicle stimulating hormone, prolactin, and 17-hydroxycorticosteroids) [3]. A recent issue of the bilingual, Chinese journal Acupuncture Research includes successful studies of acupuncture treatment for hemiparalysis, facial paralysis, cervical spondylosis, humeral epicondylitis, herpes zoster, and lumbago [4].Current research in North American and Europe includes uterine contractions [5], pulmonary disease [6], addiction, mental disorders, and as an adjunct to AIDS treatment [7]. Research continues,

but widespread acceptance and integration are still far from realized.

Traditional Meridian Theory

According to traditional Chinese medicine, a form of bodily energy called chi is generated in internal organs and systems. This energy combines with breath and circulates throughout the body, forming paths called meridians. The meridians form a complex, multilevel network which connects the various areas of the body, including the surfaces with the internal. All of the various meridian systems work together to assure the flow and distributon of chi thoughout the body, thus controlling all bodily functions. The interwoven meridian systems and the possibilities for diagnosis and treatment they offer, are called meridian theory. When an organ or system is not balanced, related acupuncture points may become tender or red, allowing for diagnosis. For treatment, a point on the skin is stimulated through pressure, suction, heat, or needle insertion, affecting the circulation of chi, which in turn affects related internal organs and systems.

â€œMeridianâ€• is the most common translation of the Chinese ching-lo (jingluo), but it is a very imperfect translation. Ching means to pass through, and lo means a net or to connect. â€œMeridianâ€• was originally used by French researchers to describe all meridians, and is used in this article in that sence. The term â€œchannelâ€• is used increasingly for all meridians, while some prefer to maintain the original distinction between ching and lo and use the terms channels and collaterals respectively. For them, meridian theory would be reffered to as the theory of channels and collaterals. There is another sub-classification of meridians called vessels. Although it is a valid distinction, it is not important to the immediate discussion.

Meridians are classified into 6 groups according to their location and function. The best known of the meridians are the 12 regular meridians, also called the major trunks. They connect with the organ they are named for by way of collateral meridians (see bellow) and run along the surface of the body either on the chest or back and along either both of the arms or both of the legs. These are the primary conduits for the passage of chi through the body, which flows through this network in a regular, 24-hour pattern. The 12 regular meridians therefore control or take part in every facet of the daily metabolic and physiological functioning of the body.

There are three meridian groupings directly associated with the regular meridians, each with 12 meridians. 1) Each of the divergent meridians arises from one of the 12 regular meridians, passes through the thorax or abdomen to join with the named organ, and then surface at the neck or head. 2) The muscle network meridians distribute chi from the 12 regular meridians among muscles, tendons, and joints, ensuring normal body motion and flexibility. This circulation of chi is referred to as superficial because there is no direct connection with an internal organ. 3) The cutaneous network meridians run parallel to the regular meridians in the cutaneous skin layer and are therefore considered even more superficial. We believe that they are a part of the function of the sensory nervous system.

The 8 extra meridians (also referred to as vessels) are the paths by which the 12 regular meridians connect, share chi, and support each other. None of the individual extra meridians are associated with a specific organ or regular meridian, though all of them connect with a number of other meridians. Their paths are considered superficial but deep. It is through the extra meridians that imbalances in chi are regulated through storage and drainage. The most important of the extra meridians are the govorner meridian, which runs along the middle of the back, and the conception meridian, which runs along the

middle of the chest and stomach.

The system of 15 collateral meridians is responsible for the thorough and complete circulation of chi. One collateral meridian arises from each of the 12 regular meridians, the governor and conception meridians, and from the spleen (which does not have a regular meridian). Each of the collateral meridians branch out, forming minute or â€œgrandsonâ€• collateral meridians, creating both horizontal and vertical connections within the complete meridian system.

Energy Medicine

This energetic view of the body is not entirely new to Western medicine. The basic concepts were present in the work of â€œvitalistâ€• scientists such as Galvani, Hahnemann, and Mesmer, who were active in the 17th through 19th centuries. Vitalism was gradually pushed out of the relm of accpeted medical science in the 19th and 20th centuries due to apparent inefficacy, but the real problem was inadequate instrumentation and a medical paradigm that made no room for energetic processes. Technology has advanced to a point where devices can successfully and consistently measure biological energy. The bodyâ€™s energetic processes have always been there and were always important, as the history of acupuncture suggests. It is now time to standardize and integrate energetic practices into modern health care and make energy medicine an essential part of medical science.

The basic premise of energy medicine (also called bio-energetic medicine) is that energetic processes, including electrical and magnetic processes, vibrational resonance, and bio-photon emission, are essential to life processes. Bio-energy functions as a carrier of â€œbio-informationâ€• and is crucial to biological self-regulation. With this in mind, there are at least three areas where medical practitioners could find useful applications: 1) gearing all treatment to preserve the well-being of the electro-magnetic energy network of the body, 2) use of beneficial, external energies in amounts similar to that already present in body in order to balance or reinforce natural energetic functions, 3) use of greater amounts of external energy to actively influence body function by way of the energy network, correcting functional imbalances. Traditional acupuncture belongs to category 2, and many modern meridian-based techniques belong to category 3.

According to what we have observed in our research, a complete, bio-energetic definition of meridians includes four facets, or â€œunitsâ€•: structure of the organ of origin, function of the organ, the electro-magnetic pathway, and emotional/vibrational interaction. All four are crucial to the creation and existence of the meridians. An organ, by its physical existence and functioning, relases energy (chi) and creates an electro-magnetic field. This energy contains information about the organ and its activity, so both the physical structure and the functioning of the organ affect the quality and strength of the energy and information that are created. This is the source of the meridians. An imbalance in one meridian often brings about imbalances in others, and other factors, including emotions, can effect individual meridians and the meridian network as a whole. Each meridian can be viewed as existing individually or as a part of the intricate meridian system and can be treated as such, though the synergistic totality of the meridian system is always of primary importance. It is precisely for this reason that diagnostic and therapeutic procedures based on meridian theory are successful at approaching the body holistically.

In electroacupuncture treatment, direct electric current is administered through the acupuncture points. This energy follows the electromagnetic tracks to the system, effecting treatment. (Electroacupuncture

therapeutics is a separate area of research and will not be discussed in detail here.) On the other hand, anything that alters or interferes with a systemâ€™s function or structure also changes the performance of the related meridian and acupuncture points. The applicatorrmal screening device (EDSD) measures the balance of systems by measuring resistance and polarization at these points. In other words, acupuncture and standard electroacupuncture are therapeutic and the EDST is used in a screening process and can be integrated into diagnostic procedures.

The Device (EDSD) and Method (EDST)

In the 1950â€™s and 60â€™s two distinct applicatorrmal screening methodologies were developed, one by Nakatani in Japan (Ryodoraku) [10] and one by Voll in Germany (EAV, electroacupuncture according to Voll) [11]. The most obvious difference between the two systems were the types of points they measured. In Ryodoraku, meridian passage points on the wrists and ankles are measured. The points used in EAV are located all over the body, though the distal points on the hands and feet are used most often. EAV is the more versatile and precise of the two methods, and for this reason we were attracted to it. EAV is the basis of the EDST, and the standard device used in EAV, the Dermatron (Pitterling Electronics, Munich), is the prototype of modern EDSDs.

There are some variations in the construction and performance of EDSDs, but all share the same basic design (Fig. 3). The core of the EDSD is an ohm meter designed to deliver approximately 10-12 microamperes of direct electrical current at 1-1.25 volts, a perfectly safe amount. (The ionization potential of hydrogen atoms is 1.36 volts; only at this level and above could any physical damage occur.) On the majority of the devices the meter is calibrated to read from 0 to 100 such that the standard skin resistance of 100 kilo-ohms reads 50. The minimum value of zero represents infinite resistance (no electrical conductivity), and the maximum value of 100 indicates zero resistance at the given voltage and amperage. Some of the devices use a range of 0 to 200, with 100 being normal skin resistance. [12]

The EDSD testing probe
The EDSD testing probe

The EDSD testing probe consists of an insulated body with a tip of brass or silver connected to the positive side of the circuit. The examiner holds the probe by the insulated body and presses the tip against the measurement point of the patient (fig. 4). The negative side of the circuit is connected to a hand applicator made of brass tubing, which is held by the patient in one hand. If medicine testing (described below) is to be done, a metal plate or holding device, usually made of aluminum, is placed in the circuit between the device and the hand applicator. The pressure of the tip of the probe on the skin might create a temporary dimple and be slightly uncomfortable, but it should not be painful. To assure adequate electrical contact, it is usually necessary to slightly dampen the probe tip and the hand applicator with water.

A reading taken with the EDSD is usually described using two values, the initial reading (generally the highest value) and the indicator drop (ID). Many practitioners also note the length of time of the ID. An initial reading of approximately 50 followed by little or no indicator drop is considered to be balanced. Initial readings above 60 may indicate inflammation in the system being measured, and initial readings below 45 may indicate changes caused by degenerative processes. An ID indicates a probable imbalance. When an ID is present it is considered the most important part of the reading, and through a

process called medicine testing the ID can be used to determine the nature and cause of an imbalance.

Voll expanded upon traditional acupuncture point classification in three directions: by discovering unknown meridians (which he referred to as â€œsystemsâ€•), unknown points on traditional meridians, and unknown functions of existing points. Vollâ€™s understanding of the traditional meridians is in agreement with the Chinese tradition in that each meridian relates to a specific internal organ (lung, stomach, heart, etc.). Vollâ€™s new meridians go beyond this to cover tissue and structure types and categories of biological function. These meridians cover joints, skin, fibrous tissue, fatty tissue, serous membranes, the nervous system (including autonomic innervation), lymphatic drainage, capillary circulation and allergic reactions. Many of the branch points are examples of newly discovered points and point functions. Branch points help tremendously in pinpointing the exact location of abnormal function. For example, the branch points on the two heart meridians (one on each of the hands) include the aortic valve, mitral valve, pulmonary valve, tricuspid valve, conduction system, and coronary arterioles. By combining the information read from all of the different types of measurement points, it is possible to determine the exact location of a given disturbance, including the layer of tissue effected.

A typical examination with the EDSD begins with the four quadrant measurements (hand to hand, foot to foot, right hand to foot, and left hand to foot) which are measurements of whole-body energy levels. These are taken using a pair of brass tube hand applicators and a pair of brass plate foot applicators. Using the probe, the control measurement points (CMP, some of which are also referred to as summation measurement points) are then measured to ascert281281ain the general condition of an entire meridian. The branch points along the same meridian are checked if there is a positive reading at the CMP or if symptoms suggest that a complete check of a meridian is warranted regardless of the CMP reading.

When a point exhibiting an ID is located, various reagents can be tested against the point in a process referred to as medicine testing. It is the goal of the physician to find one or a combination of reagents that will balance the point, i.e. cause the point tested to have a reading near 50 and not have an ID. Reagent samples in sealed glass containers are placed within the circuit of the measurement by placing them on the metal plate designed for this purpose. The physician tests various reagents, basing his selection on medical knowledge and experience, until an appropriate reagent or combination of reagents is found. A reagent that balances the reading may have a positive effect on the system being measured and therefore be an appropriate medication or dietary supplement. No response implies that the reagent would have no effect on the system, and a worsening response implies a negative effect. For example, pancreas CMP readings of a person with diabetes will become balanced when the proper dose of insulin is placed within the circuit and will show a larger ID if refined sugar is put there.

Medicine testing is perhaps the most controversial aspect of the EDSS, though many also consider it the most promising. [13] It was discovered and used by Voll in connection with homeopathy, and the effectiveness of the EDSD in testing homeopathic remedies has been demonstrated in clinical studies. [14] Homeopathic remedies serve as particularly useful reagents for medicine testing because they are prepared at various dilutions, which increases the likelihood of finding an appropriate â€œresonance,â€• a phenomenon which Kuo-Gen Chen describes in the third article of this series as â€œbio-informational quantum interference.â€• Medicine testing has also been shown effective in the testing of herbal and allopathic medicines [15] and has been used very successfully to test for allergies [16] and for the presence of environmental pathogens such as insecticides. [17] Virtually any sort of biological reagent can be tested in this fashion.

Conclusion

Acupuncture has been used for thousands of years and is effective in a wide range of situations. It has not been integrated into modern health care primarily because of lingering suspicions that it is not scientific. A bio-energetic model has been developed to explain nearly all aspects of acupuncture and meridian theory, but there remains a definite prejudice against human energetic theories in the medical-scientific community, which must be overcome before integration can take place.

The EDST and EDSD are outgrowths of the scientific, electro-magnetic understanding of meridian theory. The EDST may appear similar to other ultra-modern techniques such as MRI, but there are important differences. Both are relatively new techniques based on modern technology, but the EDST is also based on ancient practices and is safer and more holistic, versatile, and cost effective. The device is elegantly simple and not extremely expensive. Hopefully, it will help free medical progress from its dependence on ever more expensive and specialized medical instrumentation. This alone would have a profound effect on health care cost and accessibility. The quality of health care will also improve with integration of the EDST into modern medical practice. Because the EDST makes use of the bodyâ€™s meridian system, it can map out and help analyze the bodyâ€™s own signals, making it particularly useful in early diagnosis. With its solid theoretical foundation in modern physics and quantum mechanics, it is perhaps the most â€œmodernâ€• medical methodologies available today.

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Figure 7: A four quadrant measurement taken with the EDSD (Department of Physics, Soochow University, Taipei, Taiwan, earlier model) -->

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