

**Efficacy of Grounding in Combination with Acupuncture Treatments:
A Literature Review and Proposal for Translational Research**

Capstone Project Proposal

By DAOM Candidate David Kim

2017 Fall Quarter VUIM

Abstract

Grounding, also known as earthing is a well-recognized mechanism among industries because it prevents electrostatic discharge from occurring and allows for a balance in polarity during the stable stage. Many cell types manifest this similar protocol for balancing their cell polarity in the microscopic world. Cell polarity is a fundamental element for the function of almost all types of cells that differ in their shape, structure, or have the purpose of nutrient transport, neuronal signaling, cell adhesion, or cell migration. Budding yeast and developing cells require some form of polarity for their function as well. One of the earliest and most fundamental sources of Chinese Medicine text Huang Di Nei Jing, explained the concept of Qi to the people whose lifestyle, knowledge of individuals, and society was limited. Huang Di Nei Jing's text provides a simple illustration of polarity which has a similar relationship to modern days understanding of polarity. Due to the accumulation of studies and understandings regarding electromagnetic frequencies, related with polarity, some health practitioners have incorporated "grounding" or

“earthing” into the practice, because over charged positive electrons in the body provide the most effective way for electrostatic discharge to return to the ground and aid in stabilizing the patient’s polarity. Many studies show grounding has potential to help support HRV, improve sleep and reduce excessive sympathetic overdrive. Acupuncture treatment combined with grounding should also have a beneficial result because conductivity of acupuncture needles are much greater than patches of skin on the surface. This study is designed to create a bridge for ancient Chinese text and modern scientific understandings about polarity and assess the possible efficacy of grounding combined with acupuncture treatments, which rely on the same line of principal.

Introduction

Grounding, also known as earthing, is a well-known manual mechanism that balances the polarities with the related subjects on a macro scale. It is a widely recognized procedure among industries because it prevents electrostatic discharge from occurring. Many cell types manifest this similar protocol for balancing their cell polarity in the microscopic world. Cell polarity is a fundamental element for the function of many types of cells, such as cells that differ in either their shape, structure, or have the purpose of nutrient transport, neuronal signaling, cell adhesion, or cell migration. Budding yeast and developing cells require some form of polarity for their function¹. These processes include sensation, movement, the formation and reformation of body structures, physiological functioning, as well as the ways these processes come together in the perfect performance or in perfect health². Recognition regarding the concept of electrical and magnetic fields generated by tissues and organs is gaining more attention than ever. Some medical and academic research centers around the world have recognized the effects of electrical

signaling between living cell's electromagnetic interference on the human body communication(HBC)³. Due to the accumulation of studies regarding electromagnetic frequencies, some scientists have studied the effects of human cells when exposed to certain electromagnetic frequencies. (Electromagnetic Fields Affect Human Cells⁴, Effects of Electromagnetic Fields on Organs and Tissues⁵). This connection and the effects of bioelectromagnetic fields on organs and tissues have been noticed by more scientists and medical professionals. Upon these observations, some health practitioners have incorporated “grounding” or “earthing”. Over charged positive electrons provide the most effective way for electrostatic discharge to return to the ground; which connects the human body to the Earth. This in turn, balances the bioelectrical polarity, thus improving the patient's condition. Grounding has been introduced to the public and incorporated into professional's practices. The “grounding” can be applied to many different health conditions, such as internal organ tension, inflammation, as well as increasing parasympathetic activity in the nervous system⁶.

The objective of this study is to distinguish the language and cultural barrier between ancient oriental text and modern scientific understanding of polarity, and to connect the relationship between disease mechanisms and electromagnetic fields, along with the possible efficacy of grounding in combination with acupuncture treatments.

Literature Review

Qi, is one of the antiquity core principals of Chinese culture, which is considered the energy or natural force that constantly interacts with the surrounding nature throughout the universe. The concept of Qi, has a similar relationship to modern days understanding of polarity.

A medical text called “*Huang Di Nei Jing*” (HDNJ), which is directly translated to “Inner Canon of the Yellow Emperor”, dating back to at least 2,000 years, is one of the earliest and most fundamental sources of Chinese Medicine. This medical text mentioned the qi of heaven and the qi of earth, and their interaction. (Su Wen Chapter 2-9-3⁷) Another core principal includes the theory of Yin and Yang. Under the certain circumstances, HDNJ explains that Yin and Yang are the male and female of blood, with direction being aided by qi; this is the beginning of all beings. (Su Wen Chapter 5-42-4⁸)

The concept of Yin and Yang can be related to the X and Y chromosomes within our cells. The blood within us that aids with the direction of qi, can also be related to the polarity in our cells; in which the polarity aids in pulling the cell in certain directions and supports in cell division.

The text *Huang Di Nei Jing* has been very influential to the Asian medical communities for many centuries. *Huang Di Nei Jing* explained nature’s balancing mechanism from a universal scale; it aided in understanding the physiology of the human body in a time when the lifestyle, knowledge of individuals and society was limited. In modern studies, similar understandings of the natural phenomena called “electricity” was discovered around mid-17th century. Later, cell electricity and polarity in the human body was also discovered. Discovery of polarity in human cells was just the beginning in understanding the many different types of cells and cell activities. Studies show that polarity is a key factor that aids in the division of the daughter cell from mother cell in cell reproduction⁹. Moreover, scientists recognized the relationship between the diseases and human cell polarities as well. (Nature Reviews Molecular Cell Biology 18, 375-388(2017)¹⁰, Cell polarity in human renal cystic disease¹¹). HDNJ outlines a concept that described the negatively charged force on Earth’s surface, and its relation to the positively charged force in “heaven”. This balancing mechanism is more conveniently familiarized with

modern society. When western cultures started to realize the benefits of traditional Chinese medicine since the late 20th century, there have been many efforts to translate *Huang Di Nei Jing* into modern English. The explanations from *Huang Di Nei Jing*'s heaven Qi and earth Qi relation, “myriad beings bloom and bear fruit⁷”, and “evil would harm the orifices⁷” have a high possibility of correlation with the modern understandings of the Nitrogen Cycle¹², and its relationship with the Sun storm activities along with Earth's magnetic shield.

The “efficacy of grounding” from the title originates from the *Huang Di Nei Jing*'s Su Wen Chapter 2-1 and 2-2 (四氣調神大論篇 第二, 第一章-第二章), because the meaning of “Grounding,” is the balancing mechanism of polarity in our body.

Part of chapter 2 from the *Huang Di Nei Jing*'s Su Wen illustrates the interrelationship between the balancing mechanism of earth's polarities, heaven's polarities, and nature's cycle for supporting living beings including humans on this planet.

There are many different translations and interpretations of *Huang Di Nei Jing* on the internet, but there are two translations that is of popular interest. One is directly translated from text and the other paraphrases the meaning of the text into modern language. For example, Su Wen Chapter 2-1 (四氣調神大論篇 第二, 第一章)

-中略-, 夏三月, 此謂蕃秀, 天地氣交, 萬物華實.

(Direct translation): ... The three months of summer, they denote opulence and blossoming. The qi of heaven and earth interact and the myriad beings bloom and bear fruit¹³.

(Paraphrased translation): ... In the months of Summer there is an abundance of sunshine and rain. The Heavenly energy descends, and the Earthly energy rises. When these energies merge

there is an intimate connection between Heaven and Earth. As a result, plants mature, and animals, flowers and fruit appear abundantly¹⁴.

Both translations are well harmonized with the understandings of negative energy in the ground, positive energy in the atmosphere; the Nitrogen Cycle, and the interpretation of the words, which “interact”, and have an “intimate connection” from both translations. These translations also fit well into the “nitrogen fixation¹⁵” by the earth (ground) and atmospheric components of lightning mechanism.

In this context, the Qi descending from heaven¹⁴ and the Qi rising from earth is a simple but very clear illustration of earths polarities, which explains the agricultural society of the people whose life style and understanding of nature was limited, and how the positive electrons from the heaven (atmosphere) and negative electrons from the earth (ground) “interact” and “myriad beings bloom and bear fruit” more than 2000 years ago.

Another example of supplement and support of understanding is from chapter 2-2

“(四氣調神大論篇 第二, 第二章), which illustrates

-中略-, 天明則日月不明, 邪害空竅, 陽氣者閉塞, 地氣者冒明, 雲霧不精, 則上應白露不下, 則菀不榮, 交通不表萬物命故不施, 不施則名木多死.

(Direct translation): ... When heaven were to shine, then sun and moon would not shine, and evil would harm the orifices. As for yang qi, when it is obstructed, as for the qi of the earth, when its brilliance is covered, then clouds and fog are not clear. As a result, corresponding above, white dew fails to descend.

Interaction fails to manifest itself. The life of the myriad beings, hence, no [longer] receives any bestowals.

When there are no bestowals, then many eminent trees die¹³.

(Paraphrased translation): “The Heavenly energy is bright and clear, continually circulates, and has great virtue. This is because it does not radiate its brilliance, for if it did proclaim itself, neither the sun nor the moon would be visible. People should follow the virtuous way of Heaven, not exposing their true energy. In this way they will not lose it or be subject to attacks of evil energies, which produce illness in the body. If the body is attacked by evil energy, its own energy will become stuck, just as when the clouds cover the sky, obscuring the sun and moon and causing darkness¹⁴.”

The Heavenly energy naturally circulates and communicates with the Earth’s energy. The Heavenly energy descends, and the Earthly energy rises. When this intimate interaction takes place and those energies merge, the result is a balance of sunshine and rain, wind and frost, and the seasons. If the Heavenly energy becomes stuck, sunshine and rain cannot come forth. Without them, all living things cease to be nourished and lose their vitality, and imbalance manifests in the form of storms, hurricanes, and severe weather which disrupts the natural order, causing chaos and destruction¹⁴.

In this context, “邪害空竅” is directly translated to, “evil would harm the orifices”, further explanation from an annotation states, “空竅 is to say: ... :”evil qi would fill the space between heaven and earth¹⁶”. Paraphrasing from above translates to, “If the Heavenly energy becomes stuck.” This would correlate very well with the direct translation.

All these explanations: “When heaven were to shine”, “evil would harm the orifices”, “the depletion evil enters into the orifices” and “evil qi would fill the space between heaven and earth”, “Heavenly energy becomes stuck” and “The life of the myriad beings, hence, no [longer] receives any bestowals. When there are no bestowals, then many eminent trees die¹³.”; correlate

well with the interplanetary relationship of the sun storm and earth's atmospheric defense mechanism of the magnetic shield¹⁷.

Upon analyzing the text further from another angle, within the text when the sun storm (depletion evil), penetrates the “orifices” and “fill the space between heaven and earth”, it concludes with, “causing chaos and destruction” and “then many eminent trees die¹³.” This also corresponds well with the scientific explanation of “A Violent Sun Affects the Earth's Ozone¹⁷” discovery and how everything on the Earth's surface is protected from the sun's harmful ultraviolet rays¹⁸.

Therefore, the explanations from Huang Di Nei Jing's heaven Qi and earth Qi relation, “myriad beings bloom and bear fruit”, and “evil would harm the orifices” have a high possibility of the modern understandings of the Nitrogen Cycle, and its relationship with the Sun storm activities along with Earth's magnetic shield. When they are charged, “The Heavenly energy descends, and the Earthly energy rises.” More detailed and thoughtful explanation can be found from chapter 5-2-1 (陰陽應象大論篇 第五 第二章, 第一節) which illustrates:

地氣上爲雲, 天氣下爲雨

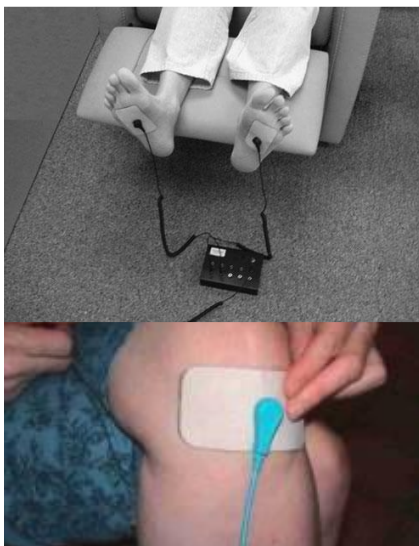
(Direct translation): The qi of the earth rises and turns into clouds; the qi of heaven descends and becomes rain¹⁹.

(Paraphrased translation): The earthly qi evaporates to become the clouds, and when the clouds meet with the heavenly qi, rain is produced²⁰.

Chapter 5-2-1 possibly illustrates how nitrogen is made available to nature, which in turn, ultimately sustains all life on Earth.¹² In nature, a balancing of the discharging mechanism happens through lightning. This type of charging process is still being studied by modern

scientists²¹. On Earth, the lightning frequency is approximately 40–50 times a second or nearly 1.4 billion flashes per year²². In the human body, a similar protocol for balancing the cell polarity is happening every second. Cell polarity encompasses numerous biological processes. Study shows that polarized cell growth is not just in animal cells, but also in plants during development and during reproduction²³. Cell polarization is one of the key factors which divide daughter cell from mother cell asymmetrically⁹. This asymmetry can be used for specialized functions, such as maintaining a barrier within an epithelium or transmitting signals in neurons²⁴.

Along with examination of recent studies regarding polarities, some health professionals are able to understand how grounding works and begin academic investigations. Published research on grounding indicates that such contact yields a broad array of favorable health-related results including improved sleep, decreased pain, a normalizing effect on cortisol, reduction and/or normalization of stress, diminished damage to muscles caused by delayed onset muscle soreness (DOMS), reduction of primary indicators of osteoporosis, and improved glucose regulation, immune response and blood fluidity²⁵.



One study concluded that grounding the human body to earth ("earthing") during sleep reduces night-time levels of cortisol and resynchronizes cortisol hormone secretion more in alignment with the natural 24-hour circadian rhythm profile²⁶. Another study conducted if grounding reduces blood viscosity and study indicated that grounding has a safe and significant effect on zeta potential²⁷. Another study was conducted to determine whether there are markers on delayed-onset muscle

soreness(DOMS), and concluded that appears to speed recovery from DOMS²⁸. In 2011, Integrative Medicine: *A Clinician's Journal* published “Emotional stress, heart rate variability, grounding, and improved autonomic tone: clinical applications”, and study concluded that Grounding has the potential to help support HRV, reduce excessive sympathetic overdrive, balance the ANS, and, thus, attenuate the stress response²⁹.

Upon review of articles, some researchers agree that about 40 minutes to 1 hour of grounding shows physiological improvement^{25,30}. This time frame of grounding is well fit for the normal duration of acupuncture treatment, and grounding combined with acupuncture treatment also should have a great result because conductivity of acupuncture needles are much greater than patches on the surface of skin.

Research Methods

There is much useful research information available about cell polarity which relates with HDNJ, along with Grounding study in PubMed, J Altern Complement Med, and NIH. This study is designed to create a bridge for ancient Chinese text and modern scientific understandings about polarity and assess the possible efficacy of grounding combined with acupuncture treatments, which rely on the same line of principal.

References

1. Retrieved from <http://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/cell-polarity>
2. Energy Medicine in Therapeutics and Human Performance. James Oschman
3. Retrieved from <http://ieeexplore.ieee.org/abstract/document/7574274/?reload=true>
4. Retrieved from <http://www.nature.com/articles/nrm.2017.11>

5. Retrieved from <https://www.scholars.northwestern.edu/en/publications/cell-polarity-in-human-renal-cystic-disease>
6. Clinton Ober, Stephen T Sinatra, Martin Zucker, James L Oschman, Earthing: The Most Important Health Discovery Ever! second edition pp. 80
7. Su Wen Chapter 2-Comprehensive Discourse on Regulating the Sprit [in Accordance with] the Qi of the Four [Seasons]
8. Su Wen Chapter 5-Comprehensive Discourse on Phenomena Corresponding to Yin and Yang Huang Di nei jing An Annotated Translation of Huang Di's Inner Classic-Basic Questions, 5-42-4
9. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2844471/pdf/nihms174968.pdf>
10. Retrieved from <https://www.sciencedaily.com/releases/2000/10/001016073704.htm>
11. Retrieved from <https://www.nap.edu/read/2046/chapter/8>
12. Retrieved from <https://www.britannica.com/science/nitrogen-cycle>
13. Retrieved from http://www.biblio.nhat-nam.ru/Huang_Di_Nei_Jing_Su_Wen-Unschuld-Tessenow-1-2.pdf
14. Retrieved from <http://www.five-element.com/graphics/neijing.pdf>
15. Retrieved from <https://www.reference.com/science/role-lightning-play-nitrogen-cycle-3d9fd93ffe431d9a>
16. Huang Di nei jing An Annotated Translation of Huang Di's Inner Classic-Basic Questions, 2-12-1, Annotation # 38
17. Retrieved from <https://earthobservatory.nasa.gov/Features/ProtonOzone>
18. Retrieved from <https://www.csmonitor.com/Science/2012/0726/Storm-clouds-could-destroy-ozone-layer-study-suggests>
19. Huang Di nei jing An Annotated Translation of Huang Di's Inner Classic-Basic Questions, 5-32-4
20. The Yellow Emperor's Classic of Medicine, A new translation of the Neijing Suen with commentary 17
21. Retrieved from <https://en.wikipedia.org/wiki/Lightning>
22. Oliver, John E. (2005). Encyclopedia of World Climatology. National Oceanic and Atmospheric Administration. ISBN 978-1-4020-3264-6. Retrieved February 8, 2009.
23. Science's Stke, Focus Issue: polarity Signals-from Cell to Organism 1 Retrieved from <http://stke.sciencemag.org/content/2002/162/eg12>
24. Retrieved from <http://www.nature.com/subjects/cell-polarity>
25. Health, 2015, 7, 1022-1059 One-Hour Contact with the Earth's Surface (Grounding) Improves Inflammation and Blood Flow-A Randomized, Double-Blind, Pilot Study pp2. <http://dx.doi.org/10.4236/health.2015.78119>
26. The biologic effects of grounding the human body during sleep as measured by cortisol levels and subjective reporting of sleep, pain, and stress. J Altern Complement Med. 2004 Oct;10(5):767-76.
Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/15650465>
27. J Altern Complement Med. Volume 19, Number 2, 2013, pp. 102-110

28. J Altern Complement Med. 2010 Mar; 16(3): 265–273. Pilot Study on the Effect of Grounding on Delayed-Onset Muscle Soreness. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3116537/>

29. Retrieved from http://imjournal.com/pdfarticles/IMCJ10_3_p16_24chevalier.pdf

30. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/20064020>