The Therapeutic Role of the Practitioner's Heart in Classical Chinese Medicine and Modern Medical Science

A critical literature review

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Abstract
This critical literature review focuses on the therapeutic role of the practitioner's heart, with emphasis on the acupuncturist's perspective.

The relevant descriptions given in classical Chinese medicine are presented. In particular, the appropriate attitude of the practitioner during treatment is discussed, highlighting the importance of compassion and clarity of intention. This is followed by a description of the acupuncture needle's role of energetic link with the patient.

Parallels were identified with results from modern research showing that positive emotions such as compassion increase the coherence of the cardiac electromagnetic field, and thereby interpersonal effects such as cardiac energy exchange and synchronisation of heart rates and heart-brain wave patterns.

The importance of these findings in providing a rationale for a patient-centred approach to treatment is discussed, together with the need for further research within the framework of modern validation of classical Chinese medicine.

Key words
Heart, compassion, intention, spiritual pivot, therapeutic relationship, acupuncture, energy exchange, biofield, electromagnetic field, coherence, entrainment, interpersonal effect, synchronisation.

1. Introduction

The focus of this critical literature review is on the role of the heart in therapy, with emphasis on the acupuncturist's perspective, as it stems from the ancient texts of classical Chinese medicine, as well as the modern scientific understanding of the heart.

The term 'classical' in the title denotes an approach that relies on tradition and its Daoist roots, in contrast with the more modern 'traditional Chinese medicine' whose focus is more pragmatic, based on scientific materialism and Confucianism (Fruehauf, 2006).

This section presents an overview of this critical literature review and gives a brief description of the heart from the viewpoints of classical Chinese medicine and modern medical science respectively. This section also details the inclusion/exclusion criteria followed in this review. Section 2 looks at the therapeutic role of the practitioner's Heart (心 *xin*) during treatment, according to classical Chinese medicine. Section 3 reviews the modern research on interpersonal physiological and psychological effects of the heart's electromagnetic (EM) field, with emphasis on their possible therapeutic applications. Section 4 is a discussion and reflection on the information drawn from Sections 2 and 3, in order to determine the extent to which the knowledge acquired by ancient Chinese therapists from their practice and intuition is supported by using the scientific method. Finally Section 5 concludes this critical literature review.

The Heart (心 *xin*) has a central importance in classical Chinese medicine, as discussed in the early acupuncture literature (circa 200 B.C.): the *Huang Di Nei Jing (*黃帝內經 *The Yellow Emperor's Classic of Internal Medicine)* which is composed of the *Su Wen (*素問 *Essential Questions)* and *Ling Shu (*靈樞 *Spiritual Pivot)* (Birch and Felt, 1999; Lu, 2004; Unschuld, 1985).

In *Su Wen* chapter 8, which lists the organs, the Heart is in prime position and is described as the emperor of the whole body (Larre and Rochat de la Vallée, 1985). This pre-eminent position is due to the Heart's relationship with the *shen* (神), the sacred light which illuminates the person with the spiritual aspect of the universe and gives consciousness and discernment (Fruehauf, 2012; Larre et al, 1986). *Shen* has also been translated by Maciocia (2005) as the Mind of a person, and Spirits by Larre and Rochat de la Vallée (1991b). *Ling Shu* chapter 71 states the spiritual importance of the Heart by explaining that it is the residence of the *shen* (Larre and Rochat de la Vallée, 1991a; Lu, 2004).

It is important to clarify that in the Chinese language, the character for the Heart, 心 (*xin*), refers implicitly to its physical, but also more importantly to its emotional and spiritual aspects (Jarrett, 1998; Rochat de la Vallée, 2009; Roth, 1999). Although it is commonly translated as Heart, *xin* refers to the core of the human being. It has no flesh radical (月) which denotes its immaterial and spiritual aspect. Its physical aspect acts as a receptacle for the *shen* (Fruehauf, 2012). Chapter 18 of the *Huainan Zi (*淮南子 *The Masters/Philosophers of Huainan*; written circa 200 B.C. by Liu An, Prince of Huainan) says that the Heart

(*xin*) is that which from a dot extends infinitely (Robinet, 1993). *Xin* is both 'Heart' and 'Mind', inextricably linked as an interactive unit, so *xin* may be referred to as the compound 'Heart-Mind' (Birch, 2009a; Matsumoto and Birch, 1988). More generally, the mind, energy, emotion and body are almost never distinguished in Oriental tradition, but are viewed as a continuum (Matsumoto and Birch, 1988). This non-dual view of mind and matter is summarised in the *Buddhist Heart Sutra* as 'form is emptiness, emptiness is form' (Dalai Lama, 2005: 60).

In Western medicine, until relatively recently the heart was considered merely as a mechanical pump for blood circulation, but is now also viewed as a neurological, endocrine and immune organ, as discussed in detail by Pearsall (1998) and Loh (2008). The heart's electrical activity has been studied since the 19th century, with the electrocardiogram (ECG) first used in 1887 to detect changes in electrical potential on the body surface (*Columbia Encyclopedia*, 2012). The natural evolution of this field of research has been to look at the human EM field (to which the heart makes the greatest contribution) as part of biofield physiology research (Hammerschlag, 2012; Hintz et al, 2003; McCraty, 2003; Rubik 2002, 2005, 2008).

This critical literature review used as inclusion criteria any text (in English, otherwise French, Spanish or Italian) that is:
- either a translation of a classic Chinese text or a modern commentary discussing the significance of the Heart in the Chinese medical model, as it applies to the practitioner, and in particular to acupuncturists
- a discussion of modern research on interpersonal effects of the heart's EM field.

The following exclusion criteria determined the studies beyond the scope of this review:
- untranslated Chinese texts, even if the abstract is translated (none appeared in the literature review)
- inner cultivation of the practitioner and possible emission of *qi* (for example in medical *qigong* training) (Chen, 2004; Johnson, 2000)
- discussions on the possible non-local effects of EM fields or intention (Tiller, 1993)
- 'limbic resonance' (tuning into another's inner emotional state) (McTaggart, 2011)
- placebo effect (Diebschlag, 2010)
- discussions of heart pathology
- research on the effects of the heart's EM field within one person (McCraty et al, 2009).

2. The therapeutic role of the practitioner's 'Heart-Mind' concept in classical Chinese medicine

The consequences of connecting with the *shen* are discussed as early as the *Nei Ye* (内業 *Inward Training*; possibly written in the 5th century B.C., with unclear authorship), which predates the *Su Wen* (Birch, 2009a; Roth, 1999): Through self-cultivation one can refine one's *qi* and as a result the *shen* (the most highly refined form of *qi*) resides within the body so one benefits from *shen ming* (神明 Divine Illumination) (Puett, 2002). One can then understand the workings of the universe, and that any change is the product of *qi* transformations, thereby obtaining knowledge about, and control over other things (including humans), since they all consist of *qi* (Puett, 2002) . Such a self-cultivated person can create change without expending energy (Roth, 1999).

In the *Zhen Jiu Da Cheng* (针灸大成 *Great Compendium of Acupuncture and Moxibustion)* compiled in 1601 by Yang Jizhou (a doctor in the Ming dynasty, 1368-1644) and cited by Matsumoto and Birch (1988: 38), it says that when the Mind of the physician has a receptive and accepting attitude, without desires, it can become *shen* (神).

Fruehauf (2012) explains that *xin* (心) is not only a receiver for the *shen*, but also a transmitter of this sacred presence from the immaterial into the material realm, so that *shen ming* means making the *shen* visible in our immediate environment. This can be interpreted energetically but also through the action of speech. Indeed, *xin* governs the tip of the tongue, thereby expressing *de* (德 Virtue) with words of wisdom (Fruehauf, 2012). *De* develops with self-cultivation and is part of a healer's training to become a good practitioner. Besides touch and technique, the Spirit of the physician is an important consideration in therapy (Matsumoto and Birch, 1988). In other words, the practitioner may illuminate the patient with their *shen ming* energetically as well as with wise speech.

2.1. Physician attitude

Sun Simiao's (581-682 A.D.) writings, translated by Unschuld (1979), advise that during treatment, a great physician has to be mentally calm and their disposition firm, without wishes or desires. They have to develop an attitude of compassion and be willing to make the effort to save every living creature. This echoes sections 27 and 67 of the *Dao De Jing* (道德經 *The Classic of the Way and the Virtue*; possibly written in the 5th century B.C. originally by the legendary Lao Zi), which explain that the sage (who lives according to the Dao) considers their compassion as a treasure and always helps and rescues living creatures. It would therefore be beneficial for an acupuncturist to take the sage as model (Strom, 2004).

When the practitioner's own Heart is still, trust is established and contact can be made with the truth in the patient's Heart. The healer does not impose their will, but assists patients in transforming by themselves (Jarrett, 1998). For this to occur, the appropriate conduct in clinic (and more generally in everyday life) is obtained by the practice of *xin shu* (心術 The Art of the Heart) which cultivates serenity and leads to *xin xu* (心虛 The Void of the Heart) where knowledge becomes wisdom (Rochat de la Vallée, 2009).

A different aspect of the practitioner's appropriate attitude is described in *Su Wen* chapter 25 and chapter 54: the hand holding the needle should be manoeuvred with great concentration and strength, as if holding a tiger. The acupuncturist should remain as alert and careful as if being at the edge of an abyss, and they must rectify their own *shen* in order to rectify the *shen* of the patient (Lu, 2004; Rossi, 2007). This is echoed in *Ling Shu* chapter

9, which explains that while needling, the physician should remain only attentive to the act of needling, and nothing else, as if being in a remote place for contemplation (Lu, 2004).

While treating, a practitioner should have a clear intention (by focusing on the therapeutic function of acupuncture points) otherwise the effect of their needling will convey an unclear treatment strategy with unclear results (Yuen, 2005). Clarity of intention is also brought by alignment with the shen, as discussed in the following section.

2.2. Spiritual connection with the outside world

Guo Yuzeng (a doctor in the Eastern Han dynasty, 25-220), cited by Lu (2004: 402) in his translation of the *Ling Shu* chapter 8, says that the Spirit is in between the physician's Heart and their hand. Thus, acupuncture treatment should be focused on the Spirit, including the Spirit of the patient and that of the acupuncturist.

The practitioner's own internal alignment with Heaven (spiritual development and cultivation of Virtue) is responsible for successful treatment because it creates a context for healing even before the needles are inserted (Jarrett, 1998).

During treatment, the practitioner's ability to use their intention, the quality of their presence or attention, are as important as the points selected or the stimulation provided. In other words, the practitioner may use their *qi* for further influencing a change in the patient's *qi* (Schnyer et al, 2008).

Furthermore, through the power of their intention, the practitioner can direct the energies controlled by acupuncture points. However, the practitioner must understand clearly and consistently what they intend the points to do if their intention is to be communicated to the patient's energy (Pirog, 1996).

Yi (意) refers to intention, without a specific goal or plan for its realisation, as opposed to thoughts actively translated into action, which are *zhi* (志), the Will (Matsumoto and Birch, 1988). With the *yi*, the practitioner extends their awareness of the surrounding energy. In addition, their intention and focus on a selected treatment strategy depend on the clarity of their connection with the *shen* (Houghton, 2010). The importance of this in clinic is that acupuncture points often have several functions and consequently different effects depending on the practitioner's focus and school of thought. In addition, Gardner-Abbate (1996) describes how a given point function may have different applications: for example, *luo*-Connecting and *yuan*-Source points of coupled meridians can be used in combinations or needling styles that are different in the English or Chinese traditions, to either tonify or disperse the energy of a meridian (and associated organ), yet clinically those different strategies work.

The practitioner's intention is also discussed by Hammer (1990) who points out the similarity between psychology and Chinese medicine: the healer is a significant factor in the healing process. Their intention (both the conscious and the unconscious) and their life-force are energies capable of profoundly interacting with the energies of the patient, even influencing them for better or worse (Hammer, 1990). Lawson-Wood (1973) cited by Hammer (1990) also states that the practitioner's Mind, their intention, has great influence upon the quality of the treatment that they will administer.

Hammer (1990) stresses the fact that the physician remains objective in their diagnosis, in particular via the art of observation of phenomena, but not alienated (such as Western physicians may be due to the lack of training of their senses and a cultural bias in favour of 'professional distance'). Together with needles and herbs, their energy is accepted as a meaningful part of the healing process. In particular, when the practitioner lays hands on the patient, in terms of healing, there is the transmission of the sense of caring, which is a form of love. Love is ultimately the great healer, and in such a relationship the physician and patient are mutually nourished (Hammer, 1990).

Finally, Fruehauf (2012) gives a poetic description of *xin* as being a central altar with the functions of connecting with the *shen*, but also establishing and maintaining unity (through the act of connection of the micro and macrocosms) and community (by connection to a higher nature).

2.3. Spiritual pivot

Birch (2009a) reviewed the translations of *Ling Shu* chapter 1, where it is said that the *shen* or the Mind (the Heart being of course the link between the two translations) of the practitioner should focus at the needle tip for effective needling, which implies an effect of the Mind on the *qi*.

In their commentary of *Ling Shu* chapter 8, Larre and Rochat de la Vallée (1991b) explain that the needle can be like a pivot that establishes communication so that the influences of Heaven (the spiritual aspect of life) can penetrate the patient. The Spirits, *shen*, are like messengers, carrying the influence of Heaven, so they are an intermediary between Heaven and Man, and the centre of reception of these influences is the void of *xin*, the Heart-Mind. Firebrace (1993), cited by Blackwell et al (1993), says that the practitioner should have good *shen ming* (Radiance of the Spirit), as a catalyst in treatment (and for their own preservation), although the acupuncture treatment works of itself, using the needle as a '*ling shu*', a Spiritual Pivot. Larre and Rochat de la Vallée (1991b) then suggest that the *shen* can pass between the physician and the patient, or the physician himself is just a pivot like the needle to re-establish an equilibrium that has been disturbed.

The *Zhen Jiu Da Cheng* (mentioned above), cited by Matsumoto and Birch (1988: 38), explains that the *xin* of the physician and the patient should be level and in harmony, following the movements of the needle. Consequently, the acupuncturist, patient and needle form a synergetic unit so that the healing process goes beyond the mere fact of needling (White et al, 2008). Indeed, for an effective treatment, the acupuncturist goes all the way to the origin of the patient's life, to the place where the Spirits are rooted in order to attract them so that they bring forth the Heavenly influence in the patient (Larre and Rochat de la Vallée, 1992, 1995).

3. Review of research on interpersonal effects of the human heart EM field

3.1. Cardiac energy exchange

The heart generates the strongest EM field of the body (up to 100 times stronger than that produced by the brain) and can be measured meters away from the body (McCraty et al, 1998; McCraty et al, 2012). Pearsall (1998) concurs by stating that when the heart beats, it generates energy that is not contained within us, and thereby may be able to signal other hearts. Moreover, cellular regulation can be influenced by EM fields pulsing in the same frequency range as the cardiac field, hence it is possible that a practitioner's heart has a therapeutic effect by influencing the patient via its radiated EM field (Oschman, 2003).

This is of particular relevance because the lack of a plausible mechanism to explain the nature of an energy exchange between people, or how it could affect or facilitate the healing process, causes a major block for its acceptance by Western science (McCraty et al, 1998). Consequently, the possibility of people exchanging energy via the heart EM field was investigated by Russek and Schwartz (1994) as well as McCraty et al (1998).

The first step was to consider how an external EM field may affect biological systems, given that the EM field radiated by the human heart was theoretically calculated to be too weak (Weaver and Astumian, 1990). The proposed underlying mechanisms were cellular signal averaging (where the cell's membrane averages the EM field, which reduces the noise – random fluctuating thermal energy) and stochastic resonance (where the noise within a biological system is entrained by an external periodic signal – here the cardiac EM wave – thereby increasing the signal intensity up to a level where it can interact with the system) (McCraty, 2003).

Both groups independently demonstrated that when people touch or are in proximity, the ECG signal of one person (the 'source') is registered in another person (the 'receiver') on the body surface (including in the electroencephalogram (EEG)), hence showing an exchange of EM energy produced by the human heart (McTaggart, 2008). This occurred in both directions (the two persons affecting each other: the other's ECG signal detected in one's EEG) in about 30 per cent of the subject pairs, otherwise only in one direction, indicating a varying degree of signal transmission. Indeed, Russek and Schwartz (1994) determined that people more accustomed to receiving love and care appear to be better receivers of others' cardiac signals, and therefore this energy exchange plays an important role in empathy and sensitivity to others (McCraty, 2003).

In addition, when a person feels a positive emotion (such as sincere love or appreciation) or has a caring intention, this increases coherence (the periodic nature) in the cardiac rhythm (and hence in the EM field), providing various health benefits, such as higher immunity, reduced hypertension or emotional disorders; by contrast, a negative emotion is associated with a more erratic pattern, as shown in figure 1 (McCraty et al, 2009; Rosch, 2009; Tiller, 1990).

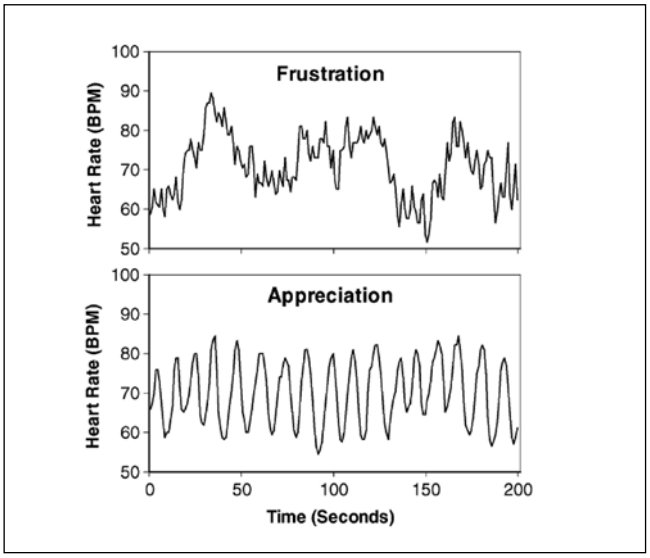

Figure 1: Emotions are reflected in heart rhythm patterns
(McCraty et al, 2009: 22).

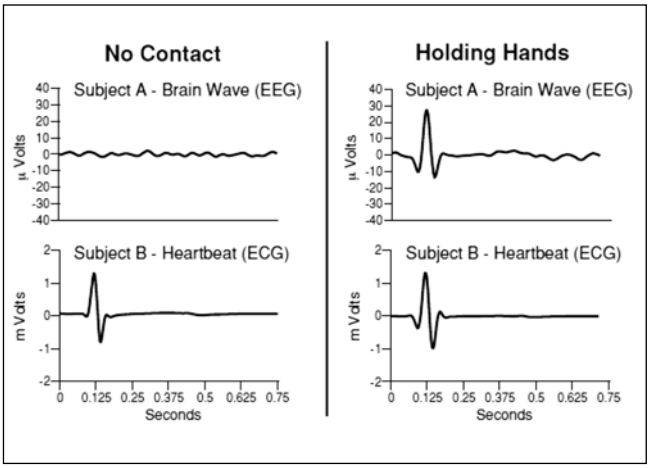

Figure 2: The electricity of touch, heartbeat signal averaged waveforms
(McCraty, 2003: 9)

In other words, in these circumstances clearer information is being transmitted outside of the body. This prompted McCraty et al (1998) to propose that via the mechanism of stochastic resonance, this increased coherence may improve the cardiac energy exchange between people. In particular, the nervous system may act as an antenna, responding to the EM fields produced by the hearts of other people (McCraty, 2003; McCraty et al, 2005).

In their experiments, McCraty et al (1998) did not instruct their subjects to have any specific intention or feeling state (presumably in order to introduce fewer variables in the initial study). The transfer of cardiac energy was detected when the subjects were holding hands (or in close proximity – about 45cm) as shown on the right side of figure 2, but not when separated by one meter (figure 2 left side). In figure 2, the source and receiver are subjects B and A, respectively (no difference was found between genders) (McCraty, 2003).

However, Russek and Schwartz (1994) did observe in their preliminary results the energy exchange between people (heart-brain and heart-heart) for a distance between subjects of up to one meter, with their eyes closed and not communicating in any tactile, visual, or auditory way. This discrepancy in detections is possibly due to the reasons stated above (variability of source and receiver) as well as duration of observation time (affecting the averaging of the signal and thereby the noise level). Finally, by comparing the amplitude of the transferred signal observed in hand holding and non-contact trials (tenfold amplitude reduction in the latter type, with distance taken into account), McCraty et al (1998) concluded that electrical conduction (through direct skin contact) plays a bigger role than EM radiation. (For completeness, McCraty (2003) mentioned that instead of a radiated wave, the signal may be transferred by electrical capacitive coupling due to the potential difference between individuals). In any case, this observed cardiac energy exchange represents a plausible mechanism for how one person can sense the presence of another and even their emotional state, independent of other signals such as body language (McCraty et al, 2009).

Morris (2010) then researched 'collective coherence', that is whether a group of people trained in achieving a high state of coherent cardiac field (focusing on the heart rate variability) could facilitate coherence in an untrained person. Using 15 trained 'senders' and as many non-trained 'receivers', the study comprised a series of 148 10-minute trials. Each session consisted of a receiver seated in close proximity to three senders who were instructed to alternatively direct toward the receiver their focused care and compassion, or focus on their coherence technique with no attention directed to the receiver.

Due to the wide variability in the receivers' achieved coherence, significant differences were difficult to establish, so a matched comparison analysis was conducted, showing that receivers obtained a higher coherence in 47.3 per cent of the cases. Another result was that when senders focused on achieving high coherence themselves, it better helped in raising the receiver's coherence than when attempting to facilitate the process. Morris (2010) interpreted this finding as indicating that the act of trying to direct facilitative energy may actually interfere with energetic transfers.

Morris (2010) then explained that the study design had assumed that senders could influence the receiver's cardiac field unilaterally. However, the sender-receiver circuit appears in fact to be a dynamic two-way channel, possibly influenced by either party. By asking participants how they felt about each other, Morris (2010) determined that the quality and extent of their interpersonal relationships had a greater effect on any energetic interaction, than the actions and intentions of the senders.

3.2. Interpersonal heart-brain synchronisation

In further non-contact trials, McCraty (2003) separated the subjects by one and a half meters and asked them to maintain a positive emotional state (although no specific intention to send energy) in order to produce a sustained coherent cardiac EM field. McCraty (2003) showed that the receiver's alpha waves rhythm (one type of the brain's oscillating electrical voltages) synchronised with the source's ECG pattern, but only if the receiver maintained a coherent field, which could be the reason for being more sensitive to others' cardiac signals, as discussed above (Russek and Schwartz, 1994; Tiller, 1990). McCraty (2003) highlighted the importance of this interpersonal non-contact heart-brain synchronisation, as it may play a role in the non-verbal aspect of therapeutic interactions (by promoting greater rapport and empathy). However, he did not elaborate on the significance of the synchronisation occurring with this particular type of brain wave. Oschman (2000) also conjectured that the source's radiated EM field may have healing power thanks to its ability to entrain (synchronise) similar coherent rhythms in the tissues of the receiver.

The results by McCraty (2003), McCraty et al (1998) and Russek and Schwartz (1994) reported in sections 3.1 and 3.2 were from selected representative examples to be considered as a proof of concept rather than be subjected to statistical analysis. There was no discussion of the level of blinding selected and whether randomization was used.

3.3. Interpersonal heart-heart synchronisation

McCraty (2003) also reported anecdotal evidence of heart rhythm entrainment (synchronisation) between individuals having a close relationship and while they focused on generating feelings of appreciation for each other. Subjects were separated by about one meter. Intermittent heart rate synchronisation was also observed during sleep in couples who are in long-term stable and loving relationships (McCraty 2003).

Subsequently and independently, Bair (2006, 2008) conducted research on the heart rate synchronization between a healer having a positive intent and a subject. The total sample size was 91 adults, of which 41 comprised the control group. All participants came for a one-hour treatment and during the session were taught how to apply a self-relaxation technique, while being kept blind to the study's actual focus. Pulse and respiration were checked before and after the session. The healer was presented as a researcher and met the whole control group together for one hour, remained more than six meters away from participants and without specific intention. The healer then met individual members of the intervention population for one hour, and sat within one and a half meters of the participant (distance determined from McCraty's (2003) results), focusing on a heart connection of compassion and highest good.

Bair (2006) found that the healer effect was visible in the synchronisation of healer/subject heart rates in the intervention subjects (which did not occur in the control subjects). Whereas before the session there was no significant correlation, just after the treatment 60 per cent of the intervention population had heart rates within ±2 beats per minute of the healer's. Pearson's r analysis (a measure of correlation) on the healer and subject heart

rates was .671 (P ≤.001 hence statistically significant) indicating a strong correlation. The healer effect was also apparent in a higher degree of reported (hence subjective) health improvements in the intervention population (reduced level of distress concerning the issue for which they had the treatment).

Bair (2008) explained that heart rate synchronisation implies a resonance entrainment (made possible due to the healer's cardiac EM field being coherent), with the possibility of transfer of information or regulation between healer and subject (corroborated by the reported health improvement), although it may occur on an energy level below the threshold of conscious awareness.

Morris (2010) also observed heart rate synchronisation between participants in his 'collective coherence' study (section 3.1), with 870 inter-subject heart rate observations in total. Of the subject pairs, 37.9 per cent showed a correlation statistically significant from zero (Pearson's r > .062 at P ≤.05, given the large number of data: 2400 samples in a ten-minute time series). Interestingly, higher levels of heart rate synchronisation were found to be correlated with higher coherence levels (of heart rate variability).

4. Discussion

Schnyer et al (2008) suggested that there is a form of physiological concordance in the patient-practitioner interaction. They proposed that there is a relationship between simultaneous changes in physiological measures (such as heart rate, skin conductance, blood pressure, respiratory rate, etc.) between the patient and practitioner, which enables access to the signalling system activated by acupuncture. They also stated that experimental evidence is not yet present.

However, in view of section 3, modern research has started providing such evidence. McCraty (2003) explained that a clinician with heartfelt positive emotions and attitudes will have a more coherent cardiac field (to which the patient is exposed), which may enhance the non-verbal aspect of the therapeutic interaction, and possibly also positively affect the patient's physiology and receptivity to treatment. This last statement has started to be researched by Bair (2006), who reported results of reduced levels of distress (see section 3.3), implying that more than just synchronization is happening.

Also, as Birch (2009b) pointed out, since an acupuncture treatment involves touch of the patient by the practitioner, the cardiac energy exchange does occur and may trigger changes in the patient's EM field (via the EM fields of the heart and brain). The effect would be to induce or enhance beneficial physiological effects produced by an increase in the patient's cardiac field coherence. This modern view of linkage by a coherent cardiac field parallels the 17th century recommendation given in the Zhen Jiu Da Cheng (mentioned in section 2.3), cited by Matsumoto and Birch (1988: 38), that the *xin* (the Heart-Mind) of the physician and the patient should be level and in harmony, following the movements of the needle.

Interestingly, the needles used in acupuncture are metallic, and as such they conduct electricity while being affected by the surrounding EM field. When a needle is inserted at the location of an acupuncture point, it will affect the electrical current flowing in the corresponding meridian (Becker and Selden, 1985). Hence the effect of the practitioner's coherent cardiac field on the patient may be focused by the needle. This idea resonates with the concept of *'ling shu'* (detailed in section 2.3), the Pivot passing the *shen* between practitioner and patient.

In both classical Chinese and modern approaches, the practitioner's intention or mental focus is an important factor modulating the effect of the heart. Indeed, a healer's compassionate intent can cause interpersonal non-contact synchronisation of heart and brain, as shown by McCraty (2003) (section 3.2), as well as heart rates (Bair 2006) (section 3.3).

Morris (2010) also observed heart rate synchronisation in his 'collective coherence' study (section 3.1), opening up the possibility for what he calls 'heart-to-heart bio-communications' (Morris 2010: 72). Therefore practising emotional empathy is mutually beneficial, as thoughts and emotions are likely to influence the qualitative aspects of the energetic interactions between people. This is consistent with Pearsall (1998) who proposes that a patient is healed by the presence of 'healing loving hearts' joining with their heart, and not just by the actions of medical staff. However, Morris (2010) explained that, based on his results, it is best not to try to impose a particular emotional state on others, as energetic interactions seem to be impeded rather than enhanced when over-engaging the mind relative to the heart. In other words, personal coherence seems to be the best foundation to forge collective coherence. This is supported by the results of a large-scale sociological project (5,124 participants) using data of the Framingham Heart Study: a happy next-door neighbour increases one's probability of happiness by 34 per cent, and a happy friend living within a mile by 25 per cent (this effect decays with time and geographical separation). This implies that happiness, like health, should be seen as a collective phenomenon, since people's happiness depends on the happiness of others with whom they are connected (Fowler and Christakis, 2008; McTaggart, 2011).

5. Conclusion

The recent research findings from McCraty et al (1998, 2005, 2009), Russek and Schwartz (1994), Bair (2006) and Morris (2010) indicate that the practitioner's heart plays a role in the healing encounter. In particular, the observed cardiac energy exchange and interpersonal synchronisation parallel the classical Chinese medical descriptions of the physician's appropriate behaviour and the acupuncture needle acting as a link and focus of energy passing to the patient. These preliminary results warrant further research: a comprehensive rigorous study of these elements of convergence, which may provide a basis for further modern validation of classical Chinese medicine, and thereby a greater public acceptance.

This research should eventually benefit the patients' health, hence the increasing interest on this topic, with gradually more Western doctors asking whether the subtle bioelectromagnetic energy can be harnessed for health enhancement (Rosch 2009). The results reported in this review already show the importance of a patient-centred rather than a disease-centred approach to treatment (Jones 2010). In other words, Western-trained clinicians should evolve from the role of 'curing disease through modern science' and back to their traditional role of 'healer of the sick', forming a 'healing partnership' with the patient (Jones et al, 2010: 72).

This has started to be considered carefully, for example by Miller et al (2009) who characterized the placebo effect as a form of interpersonal healing, instead of being an umbrella term for every non-understood effect (such as EM field, beliefs or relationships) (Diebschlag, 1993). Hence the cultivation of the practitioner's intention has important implications for treatment, as it enhances both clarity of intention and the capacity to maintain energetic coherence despite the patient's influence (Diebschlag, 2010).

Finally, during an acupuncture treatment, the therapeutic relationship has both specific and non-specific aspects. Rapport building with compassion (increasing cardiac coherence) and communication to engender empathy might be seen as non-specific. Yet at least the two following aspects are specific to acupuncture: 1. The fact that the needle acts as a pivot to focus the practitioner's intention; 2. Palpatory diagnosis to identify points may have a therapeutically active component (MacPherson et al, 2006; Schnyer et al, 2008; White et al, 2008). Both aspects are consistent with the observations of cardiac energy transfer being greater when people are in direct contact and highlight the therapeutic role of the practitioner's heart.

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