



Is compassion a part of the non-specific effects of acupuncture?

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ABSTRACT

Acupuncture is widely used for the treatment of chronic (long-term) pain. In a recent study, Vickers et al. characterized the analgesic effect of acupuncture in four different chronic pain conditions, back and neck pain, osteoarthritis, headache, and shoulder pain, and concluded that acupuncture is an effective type of treatment for these chronic pain states.

Significant differences between true and sham acupuncture indicate that acupuncture induces superior effects. However, these differences were reported to be relatively modest, suggesting that non-specific effects, in addition to the specific effects of the needle stimulation, are important contributors to the therapeutic effects of acupuncture. It has been demonstrated that two factors that are seen as non-specific are related to individual therapists' interaction with the patient and the patients' positive expectation of the treatment effect.

The therapist–patient interaction has been shown to be unrelated to empathy but may be attributable to the ability to express compassion. Compassion implies being attuned to undeserved suffering, but it is also a signaling behavior related to care giving that has physiological responses that orient the individual to social interaction. It is possible that therapists that report good treatment outcomes are more compassionate in their interaction with their patient compared to the therapist reporting poor outcomes.

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1. Acupuncture and non-specific effects

Acupuncture is a complex intervention that achieves its outcome through a combination of specific and non-specific mechanisms, including the patient–therapist relationship, the individual therapists' compassion, the patient's expectation of positive treatment results, suggestibility, conditioning to the treatment situation, treatment rituals, and the therapist bias concerning the treatment [1,2]. In a recent study, Vickers et al. characterized the analgesic effect of acupuncture in four different chronic pain conditions: back and neck pain, osteoarthritis, headache, and shoulder pain [3]. They concluded that acupuncture is an effective treatment in these chronic pain states. In addition, they reported significant differences between true and sham acupuncture, suggesting that acupuncture is more effective than a sham procedure. However, these differences were relatively modest, suggesting that additional factors other than the specific effects of the needle stimulation (i.e., the non-specific effects) were important contributors to the total therapeutic effects of acupuncture.

To elucidate the influence of contextual factors, White et al. investigated possible enhanced non-specific effects associated with

needle stimulation in acupuncture treatment [2]. The non-specific effects of acupuncture were assessed in 221 osteoarthritis (OA) pain patients using a multitude of interventions (manual acupuncture stimulation, the use of Streitberger “placebo” acupuncture needles, mock transcutaneous electrical nerve stimulation) each with empathic or non-empathic consultations. The patients rated lower pain intensity after all interventions compared with baseline. Empathic consultations did not affect pain. One therapist had significantly better outcome. The patients perceived the “best” therapist to be a paternalistic male authority figure and the authors suggested that this possibly may be because he was seen as the expert, consequently establishing higher expectations of success. In another study though, assessing the effects of acupuncture in hot flashes, the “best” therapist was found to be a female who was reported by the patients as demonstrated more compassion. Interestingly, four independent assessors of the trial, who had met with the trial therapists, had all predicted that she was going to be the therapist with the best outcomes. Taken together, these results would suggest that an undefined characteristic of the treating therapist can be used to predict the outcome as well as the patients' expectations. Interestingly, these two factors were shown to be independent of each other in the study by White et al. [12].

The obvious question is “What characterizes the best (or a very good) acupuncture or related technique therapist?” Is it possible

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that a therapist with a better-reported outcome is more compassionate (resulting in a better attachment between the therapist and the patient) compared with a therapist where patients report poorer outcomes?

2. Compassion – definition and evolution

Compassion is defined as a feeling of deep sympathy and sorrow for another who is stricken by misfortune, accompanied by a strong desire to alleviate the suffering. Compassion is regarded as a fundamental part of human love, social interconnection and humanism, but it is also considered foundational to the highest laws in philosophy, society, and personhood. In a clinical context, compassion may be defined as the feeling that arises in witnessing another's suffering and that motivates a subsequent desire to help [4–6]. This definition conceptualizes compassion as an affective state defined by a specific subjective feeling and differentiates compassion from sympathy, pity and empathy, out of which the latter refers to the vicarious experience of another's emotions [7,8]. In addition, it has been argued that the term compassion is better because it encompasses a broader set of states, i.e., states that center upon a concern for ameliorating the suffering of another individual [9–11]. It may be argued that compassion emerged as a distinct affective state and trait because it enhances the welfare of vulnerable offspring, because it is a desirable emotion or attribute in mate selection processes, and because it enables cooperative relations with non-kin [12–17]. Within the context of this vulnerable offspring argument, compassion is thought to have emerged as the affective element of a care giving system designed to help raise vulnerable offspring to the age of viability and thus ensuring that genes are replicated Warneken and Tomasello [18,19].

3. Elicitation of compassion: the interoceptive system – influence of touch – “placebo acupuncture” – vocational communication

3.1. The interoceptive system

It has been reported that primates have a distinct cortical image of homeostatic afferent activity that reflects all aspects of the physiological condition of the body [20]. This interoceptive system, associated with autonomic motor control, is distinct from the exteroceptive system that guides somatic motor activity. The primary interoceptive representation in the dorsal posterior insula produces distinct feelings from the body that include pain, temperature, itch, touch, muscular and visceral sensations, vasomotor activity, hunger, thirst, and other such sensations. In humans, a representation of the primary interoceptive activity is created in the right anterior insula, which provides the basis for the subjective image of the material self as a feeling (sentient) entity, that is, emotional awareness [21,22]. Likely, endogenous homeostatic control mechanisms (including parasympathetic and sympathetic) modulate the integration of afferent and efferent activity that produces emotional awareness [23,24]. Such integration of all feelings from the body points to the dependence of subjective well-being on the physiological health of the body [72]. The emerging evidence from imaging studies that volitional cortical control in humans can directly modify homeostatic integration and the substrate of the feeling of self signifies the fundamental role of this interoceptive system in human consciousness [25,26].

3.2. Touch

Non-verbal expressions of emotion serve several functions [27,28]. Emotional displays in the face, voice, and body signal

specific intentions. It has been demonstrated that touch is the primary form of interaction for the development of secure attachments and cooperative relationships. Olausson et al. have reported that there are two sensory systems with possible roles in secure attachments. One of these systems is set up by mechanosensitive C-fiber tactile (CT) afferents sensitive to slowly moving stimuli on hairy skin that project to the posterior insular cortex and signal pleasant aspects of touch. However, CT-fibres have not been found in the glabrous skin of the hand despite the fact that glabrous skin touch is also perceived as pleasant. Therefore, Olausson et al. recently set out to elucidate if the brain processing of pleasant touch differs between hairy and glabrous skin by stroking the forearm and glabrous skin of the hand. When comparing slow brush stroking on the forearm with slow brush stroking on the palm, there were significant activations of the posterior insular cortex and mid-anterior orbitofrontal cortex. In contrast, the palm touch resulted in a significant activation of the somatosensory cortices. These results are in line with the reports of psychophysical rating using a newly developed “touch perception task.” Emotional descriptors received higher ratings on the forearm and sensory descriptors were rated more highly on the palm. Olausson et al. recent findings are consistent with their hypothesis that pleasant touch of hairy skin, mediated by CT afferents, is processed in the limbic-related cortex and represents an innate non-learned process. In contrast, pleasant touch from glabrous skin, mediated by A-beta afferents, is processed in the somatosensory cortex and represents an analytical process dependent on previous tactile experiences [29]. It has also been reported that light touch induces activation of the reward system in the brain [30], whereas hard pressure may result in stress [31,32].

3.3. Placebo acupuncture

Touch also promotes cooperation and reciprocal altruism. In humans, friendly patterns of touch have been found to increase compliance to requests [33] and cooperation with strangers in economic games [34]. This would suggest that touch is involved in two social processes related to compassion: soothing and the formation of cooperative bonds. If so, tactile contact using different types of “placebo” acupuncture or verum acupuncture is a modality in which compassion is communicated [35–37]. For example, participants in a study were asked to communicate 12 different emotions to another participant via touch on the forearm, including sympathy, fear, sadness, and love. In general, the recipients of the touch could discern that sympathy was being communicated. Interestingly, patting and stroking were also associated with, but considered separate from, love and gratitude. In another study, videotapes of brief hand-to-forearm touches were interpreted as being associated with sympathy by the observers of the videotape [35]. This is in contrast to the low recognition accuracy of compassion, fear, sadness, and happiness in facial expression modalities [38–40,73]).

3.4. Vocal communication

Recently, it has also been emphasized that compassion is communicated through the voice. Participants were asked to communicate different emotion states with brief non-word utterances (vocal bursts). Vocal bursts of compassion were then presented along with those of 12 positive states, including love and gratitude. Observers were often able to identify the emotion (including compassion, love and gratitude) being expressed [5].

In summary, compassion appears to be more readily communicated through touch and possibly the voice. These findings are in line with the primacy of touch early in infant development [41]. Given the lower accuracy rates of recognizing compassion

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