

ACUPUNCTURE AND PLACEBO ACT DIFFERENTLY IN THE HUMAN BRAIN
 ACUPUNTURA E PLACEBO AGEM DE FORMA DIFERENTE NO CÉREBRO HUMANO

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Much has been said lately concerning acupuncture and its mechanism of action. In fact, as we look into the subject, very few conclusions can be drawn without a certain doubt. Clinical trials are usually unfavorable to acupuncture; their drawbacks concerning the acupuncture technique, however, make it impossible to decide what is right and what is wrong.

One form of looking beyond the clinical effect and see exactly what acupuncture makes inside us is using functional screening methods, such as fMRI (functional magnetic resonance imaging), during acupuncture sessions. Several studies have used this method to determine which areas of the brain are stimulated or depressed by acupuncture and what neurotransmitters and hormones are activated by this type of treatment, in comparison or not to placebo.

A recent article by Harris et al., published in *Neuroimage*, 2009, however, goes beyond the looking glass; instead of neurotransmitters, what about their receptors? The main idea of this article is to compare the effects of verum acupuncture and placebo acupuncture in μ -opioid receptors (MORs) in the brain. And instead of choosing only one or a few acupoints and only one session, the authors chose to perform a complete treatment for fibromyalgia. Twenty patients were scanned using C-carfenanil (CFN - a μ -opioid selective radiotracer) positron emission tomography (PET) in the first session of treatment, before and after the introduction of needles, and in the last (9th) session.

The treatment protocol (Du 20, ear Shenmen, LI4, LI11, Sp6, Liv3, GB 34, bilateral St36) was not perfect since the Chinese syndrome was not evaluated, rather a commonly used protocol aiming at lowering the pain for this type of occidental disease was chosen. However, there was special concern towards obtaining *De Qi* and avoiding any physiological effect of the control procedure, what apparently achieved success, by using a previously validated placebo needle that does not penetrate skin. All the placebo points chosen were in similar areas to the original points, but were no known acupoints and neither were in any meridian track. Blinding was successful up to the end of the study.

Both groups showed similar clinical response to acupuncture, what is probably due to expectation, rather than any physiological effect of the placebo procedure. Nevertheless, their action mechanisms were significantly different; whereas at long

and short term the verum acupuncture elicited increases in MOR binding potential (BP) throughout the brain, placebo acupuncture decreased it or resulted in no changes after the session. Verum acupuncture affected mainly the thalamus, the cingulate, the insula, the caudate, the putamen and the temporal pole; placebo acupuncture affected the dorsolateral prefrontal cortex, right amygdala and left insula.

It is expected that the immediate effects of verum acupuncture result of neuron stimulation and its modulation of receptor expression at the plasma membrane. A long-term depression-type modulation would explain the long lasting effects of acupuncture observed in this and in other trials.

By evaluating such a unique mechanism of action, I am led to believe that acupuncture, that has been regarded so far as “no better than placebo” in certain trials, is being misused and underestimated. Perhaps, if acupuncture were used for other types of pain in which the expectation effects and its inherent unspecific analgesia effect were not enough to completely subdue pain, we would finally find a clinically and statistically significant difference between acupuncture and placebo, as we can see in some recent meta-analysis.

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Errata

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