# Acupuncture Relieves Depression, Regulates Gene Expression

*Published by HealthCMi* on 08 September 2014.

University of York researchers conclude that acupuncture effectively reduces the severity of mental depression. In a randomized controlled trial, researchers note that acupuncture causes a “significant reduction in symptoms of depression in the short to medium term, and are not associated with serious adverse events.”

The acupuncture continuing education researchers cite the use of anti-depressant drugs as the “front-line treatment in primary care,” however, their investigation reveals that 60% of patients do not respond adequately. The study tested for acupuncture as a possible non-pharmacologic supplement to primary care for patients that are unresponsive to usual care, including medications. The results conclusively demonstrate that acupuncture is both safe and effective as an adjunct therapy to primary care for patients with depression.

Approximately 20 million people suffer from depression in the USA. Typical onset is between the ages of 15 and 30. Depression includes a variety of symptoms including excess sadness, exhaustion, suicidal tendencies, weight change, low self-esteem, inability to experience pleasure or enthusiasm, and sleep disorders. Depression is caused by a variety of factors including seasonal affect disorder, postpartum deficiency, traumatic life events, hormonal imbalances, and brain chemistry issues. It may also be related to a genetic predisposition. Blood pressure medications, PTSD (post-traumatic stress disorder), alcohol and drug abuse, and personality disorders are significant risk factors.

A related laboratory investigation demonstrates that acupuncture benefits brain biochemistry and regulates gene expression related to depression. The researchers conclude that electroacupuncture treats “depression by modifying or regulating the expression of various genes.” Acupuncture was applied to acupuncture points Baihui (DU20) and Yintang on depression model laboratory rats. Electroacupuncture was applied at 2 Hz,1 mA, to a depth of 2 mm. Acupuncture needles were applied one time per day for 21 days. Needles were retained for 20 minutes during each acupuncture treatment.

The research shows that depression causes “abnormal gene expression” in “a large number of genes” and this affects “multiple brain functions” and nerve cells. Depression causes pathological biochemical changes and these changes cause more depression. The researchers note, this “vicious circle makes it difficult to cure conditions such as depression.” The researchers note that this educational investigation indicates “that electroacupuncture at Baihui and Yintang modulates depression by regulating the expression of particular genes.”

A total of 21 genes imbalanced by depression were normalized by the application of electroacupuncture. The researchers note that all 21 genes “were closer to a normal level” after the application of electroacupuncture. Clinically, electroacupuncture restored normal behaviors in the laboratory rats including actions in sucrose consumption, the swim test and the open field test.

Genes were examined in the hippocampus, an part of the brain involved with learning, memory and emotions. The genes Tmp32, Vgf:Tmp32 and Vgf are downregulated during depression and are normalized by upregulation with electroacupuncture. The genes regulate neuroactive steroid hormones important to the nervous system. They regulate the function of the synapses, inflammation, myelination, the central nervous system and the HPA axis. The gene Trim32 “was downregulated in depression and returned to normal after electroacupuncture.” The same was found for Igf2, a gene that promotes nerve cell proliferation and increased neurotransmitter levels between synapses. In the same way, Loc500373 and other genes were normalized. Loc500373 is involved in ATP formation and energy metabolism. Electroacupuncture was shown to “promote ATP formation” and consequently improved cell function.

Electroacupuncture normalized Rtn4 gene levels and restored normal brain protein biosynthesis. Electroacupuncture normalized levels of Hifla, an important gene regulating cellular apoptosis. Electroacupuncture successfully downregulated genes involved in oxidative stress and inflammation that had been pathologically upregulated by the biological impact of depression. The investigators note that this normalization benefits the brain by “maintaining tissue structure” and “restoring cell function.” The researchers note that this effect provides “evidence to the observed clinical effect of electroacupuncture on depression.” The study shows that acupuncture normalizes gene levels involved in transcription/translation, neurotransmission, signal transduction, immune system inflammatory responses, metabolism, enzymatic reactions and protein biosynthesis.

References:

MacPherson, H., S. Richmond, M. Bland, S. Brealey, and R. Gabe. "Acupuncture and Counselling for Depression in Primary Care: A Randomised." (2013).

Duan, Dongmei, Xiuyan Yang, T. Ya, and Liping Chen. "Hippocampal gene expression in a rat model of depression after electroacupuncture at the Baihui and Yintang acupoints." Neural Regeneration Research 9, no. 1 (2014): 76.