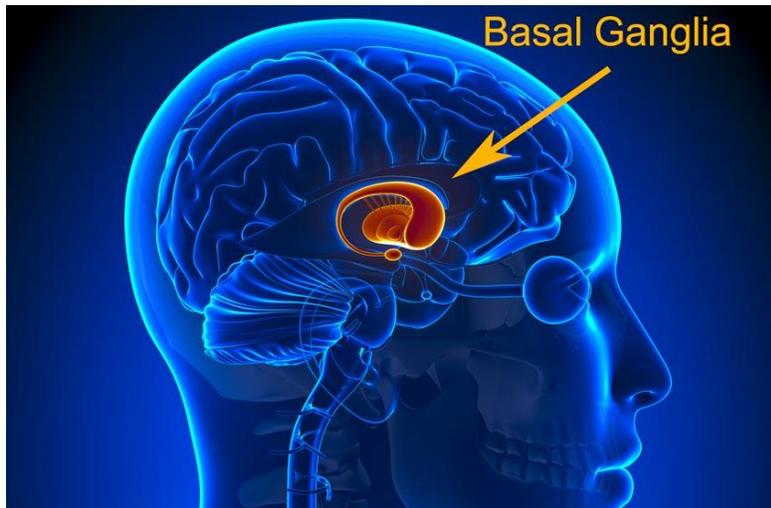


# Acupuncture Methamphetamine Addiction Discovery

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Acupuncture suppresses methamphetamine addiction. Daegu Haany University and Qiqihar Medical University researchers investigated acupuncture as a means of suppressing intravenous methamphetamine self-administration. Based on the results of a controlled laboratory experiment, the research team concludes that the application of acupuncture to an acupoint located on the wrist suppresses methamphetamine self-administration via the GABA

(gamma-aminobutyric acid) receptor system. The researchers suggest that acupuncture is “a useful therapy for the treatment of methamphetamine abuse.” [1]

The controlled experiment compared the effects of two acupoints. One reduced methamphetamine self-administration and the other did not. Acupuncture point HT7 (Shenmen) was effective. LI5 (Yangxi) did not reduce methamphetamine behavior in the laboratory experiment.

The researchers find a neuronal mechanism responsible for the success of HT7 in reducing methamphetamine addictive behavior. Administration of GABA receptor antagonists BIC (bicuculline) and SCH-50911 blocked the therapeutic effects of acupuncture, indicating that the effects of acupuncture are “mediated, at least in part, via the GABA receptor system.” GABA is a neurotransmitter responsible for inhibiting central nervous system excitability in adults. The researchers add that this is consistent with findings from another investigation demonstrating that acupuncture suppresses morphine related addictive behaviors.

## Results

Acupuncture at HT7 reduced methamphetamine self-administration to 21.66% of the LI5 control group’s rate of self-administration. Acupuncture at HT7 reduced self-administration to 25.43% of the overall baseline level. The researchers comment, “acupuncture at the specific acupoint HT7, but not at the control acupoint LI5, markedly suppressed the methamphetamine self-administration behavior.” [2] The laboratory experiment was conducted using male sprague-dawley laboratory rats.

The researchers comment that the effects of acupuncture are point specific; LI5 is ineffective and HT7 is highly effective. They note that both LI5 and HT7 are located in the region of the wrist but only HT7 is effective. They add, “According to the hypothesis that methamphetamine exerts its reinforcing effect by enhancing dopaminergic neuron activity, the effect of acupuncture at HT7 may be due to ameliorating the DA system.”

The research team provided the basis for the acupuncture point selection. They note that in TCM (Traditional Chinese Medicine), the function of the brain is closely related to the heart and fire (the heart’s associated five element category). They add that acupoint HT7 (Heart #7) is a yuan-source point of the heart channel and—according to TCM principles—is indicated for the treatment of neuropsychiatric disorders, including addiction. The researchers cite eight independent investigations finding HT7 effective for ameliorating the effects of drug addiction. The investigations found acupuncture effective for ameliorating the addictive effects of nicotine, methamphetamines, morphine, alcohol, and cocaine. Based on the evidence, the investigators chose HT7 for the study.

### **LV3 and KD9 Electroacupuncture**

In related research using different acupuncture points, Ho et al. find acupuncture effective for ameliorating methamphetamine addiction. In the experiment, a unilateral application of acupuncture points LV3 (LR3, Taichong) and KD9 (KI3, Zhubin) was used. The researchers note, “EA [electroacupuncture] may be a useful nonpharmacological approach for treating METH-induced behavioral changes, probably because it reduces the METH-induced TH [tyrosine hydroxylase] expression and dopamine levels and raises MAO-A expression in the NAc [nucleus accumbens].” [3]

TH is an enzyme that converts L-tyrosine to L-DOPA, a precursor of dopamine. Electroacupuncture at KD9 and LV3 prevented methamphetamines from causing overexpression of dopamine and TH. Electroacupuncture raised MAO-A levels. MAO-A (monoamine oxidase A) is responsible for metabolizing norepinephrine, serotonin, and dopamine. This effective action helps to prevent overexpression of dopamine.

The researchers note that the regulation of TH, dopamine, and MAO-A via electroacupuncture occurs in the NAc (an area of the basal ganglia). The reward circuitry of the brain is located in the basal ganglia. The nucleus accumbens (NAc) is a section of the limbic region of the basal ganglia. NAc neurons are GABAergic, meaning that they modify GABA. Another section of the limbic region of the basal ganglia is the ventral tegmental area (VTA). The VTA has dopaminergic neurons projecting into the nucleus accumbens (NAc).

The researchers conclude, “our results demonstrated that EA at KI9–LR3 can inhibit repeated METH-induced behavioral sensitization and CPP [conditioned place preference] in mice, possibly by modulating the activity of the dopaminergic system in their NAc. In addition, EA at specific acupoints may be an effective nonpharmacological therapeutic method for METH abuse.” [4]

The researchers had two other pairs of electroacupuncture points tested in the research. Electroacupuncture from ST36 (Zusanli)–LV3 and PC6 (Neiguan)–LI11 (Quchi) did not reduce methamphetamine induced addictive behaviors. As a result, the researchers note that “METH- induced behavioral sensitization are associated with specific acupoints combinations.” [5] Notably,

electroacupuncture from KD9 to LV3 “affected CCP considerably.” CPP is a Pavlovian based conditioning that is used for identifying “the addictive liability of compounds in animals.” [6]

The researchers conclude that electroacupuncture “may be used as a nonpharmacological therapy for drug addiction by regulating the hemostasis balance mechanism.” [7] They add that the findings indicate point specificity. Only certain acupuncture points are useful for treating specific diseases and behavioral changes induced by drug use.

### **Point Specificity**

Ho et al. cite research indicating point specificity. In one body of research, KD9 was found effective for preventing alcoholics from relapse into alcohol use. [8] They add, “Acupuncture treatment at the bilateral HT7 (Shenmen), but not PC6 (Neiguan), has been shown to reduce cocaine-induced behavioral sensitization and TH expression in the VTA.” [9, 10] In addition, HT7 and not PC6 was found effective for reducing the withdrawal effects of alcohol. [11] However, PC6 was found effective for the treatment of internet addiction and for the alleviation of heroin withdrawal syndrome. [12] ST36 demonstrates the ability to modify opioid related addiction but was not effective in this research for methamphetamine addiction. [13]

### **Electroacupuncture**

Ho et al. used an HC-0502 electroacupuncture device made by Home Care Technology, Co., Ltd. (Taiwan). The pulses were set to 100 Hz for 15 minutes per session and the intensity was set to elicit light muscle movement (1.5–2 mV). The researchers cited research finding electroacupuncture effective for releasing neuropeptides or neurotransmitters (e.g., endomorphin, enkephalin, substance P, serotonin) in a frequency dependent manner. [14, 15] Low frequency electroacupuncture at 2 Hz increases levels of endomorphins, enkephalins, and endorphins, whereas high frequency electroacupuncture at 100 Hz increases the release of dynorphins. [16] They add that, “In studies on morphine-induced behavioral changes, 100 Hz EA [electroacupuncture] effectively suppressed the withdrawal syndrome, and CPP could be improved using EA of only 2 Hz.” [17, 18, 19]

Research supports the use of acupuncture for the treatment of methamphetamine abuse. The aforementioned research indicates that specific acupuncture points are indicated and that electroacupuncture produces beneficial clinical effects. To learn more, consult with local licensed acupuncturists in your area.

## Notes

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- [4] Ibid.
- [5] Ibid.
- [6] Ibid.
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- [8] Lee, Jin-Seong, Sung-Gon Kim, Taek-Geun Jung, Woo Young Jung, and Seong-Yeon Kim. "Effect of Zhubin (KI9) acupuncture in reducing alcohol craving in patients with alcohol dependence: a randomized placebo-controlled trial." *Chinese journal of integrative medicine* 21, no. 4 (2015): 307-311.
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- [14] Han, Ji-Sheng. "Acupuncture: neuropeptide release produced by electrical stimulation of different frequencies." *Trends in neurosciences* 26, no. 1 (2003): 17-22.
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