

Study Suggests Electroacupuncture May Lower Blood Pressure

By Editorial Staff

Scientists at the University of California, Irvine have discovered that certain types of electroacupuncture may dramatically reduce blood pressure levels. Research funded by the National Heart, Lung and Blood Institute and published in a recent issue of the *Journal of Applied Physiology*¹ has shown that low-level electrical stimulation at specific points on the front legs of rats reduced elevations in blood pressure by more than 40 percent, setting the stage for large-scale trials in humans and providing health care practitioners with another option for the treatment of hypertension.

"This study suggests that acupuncture can be an excellent complement to other medical treatments, especially for those treating the cardiac system," said Dr. John C. Longhurst, director of the university's Susan Samueli Center for Integrative Medicine and the lead author of the study. "The Western world is waiting for a clear scientific basis for acupuncture, and we hope that this research ultimately will lead to the integration of ancient healing practices into modern medical treatment."²

In the study, Longhurst and a team of researchers performed both manual acupuncture and electroacupuncture on several groups of rats. To simulate hypertension in humans, the blood pressure of the rats was artificially elevated by inflating a latex balloon surgically inserted into rats' stomachs to create abdominal distention. A variety of protocols were tested in the trial, including:

- A sham acupuncture protocol, consisting of insertion of needles perpendicularly into the rats' forelimbs at a location corresponding to points Pericardium 5-6 in humans, without manual manipulation or electrical stimulation, for 30 minutes. In addition, a control acupuncture protocol was performed, involving bilateral insertion of needles into control points corresponding to Large Intestine 6-7 in humans, stimulated electrically, using low current and low frequency, for 30 minutes.
- Insertion of needles bilaterally into Pericardium 5-6, with two minutes of manual twisting of the

needles every 10 minutes for 30 minutes. Alternatively, needles were inserted bilaterally at P 5-6 and stimulated electrically (2 hertz, 0.3-0.5 microamps) at 0.5 millisecond intervals for two minutes. While the rats were being stimulated, the scientists also performed procedures that periodically raised the rats' blood pressure levels.

- Electrical stimulation at P 5-6, using various frequencies (2 hertz, 40 hertz and 100 hertz). During electroacupuncture (EA), and for one hour following the procedure, changes in blood pressure levels were recorded every 10 minutes. In addition, the activity of median nerve fibers was observed in two rats given 60 seconds of electroacupuncture at five frequencies (2, 10, 20, 40, and 100 hertz).
- Electroacupuncture at locations corresponding to either Stomach 36-37 or Heart 6-7 in humans, performed on two separate groups of rats. To determine if using combinations of points was more effective than using one point, the researchers also subjected one group of rats to simultaneous stimulation of P 5-6 and Stomach 36-37.

While each protocol was performed, the researchers measured any changes in blood pressure and heart rate that occurred in the rats, along with activity levels of somatic afferent fibers that carried sensory impulses from the skin and skeletal muscles to the central nervous system.

Results

In the sham and control acupuncture protocols, "neither acupuncture needle insertion at P 5-6 without stimulation for 30 minutes, nor 30 minutes EA at an inactive acupoint (LI 6-7) influenced the gastric distention-induced pressure responses over a similar time period." Heart rate in all of the time-control groups remained unchanged.

Both manual acupuncture and electroacupuncture at Pericardium 5-6 produced "an immediate and a prolonged reduction of the cardiovascular blood pressure response to gastric distention," lasting between 50 and 60 minutes. Average reduction of blood pressure levels was similar between therapies (33 percent for manual acupuncture, 36 percent for electroacupuncture); however, blood pressure levels in rats stimulated with electroacupuncture remained lower an average of 10 minutes longer than rats given manual acupuncture. In addition, more afferent fibers were activated in rats treated with electroacupuncture than those in the manual acupuncture group.

In the group treated with various frequencies of electroacupuncture, 30 minutes of electrical stimulation at P 5-6 at a frequency of 2 hertz "significantly inhibited the gastric-cardiovascular pressor reflex," whereas

stimulation at 40 hertz and 100 hertz did not. The researchers also noted that the lower the frequency, the more likely afferent fibers were to respond: "In total, afferent stimulation at 2, 10, and 20 Hz activated 79, 29, and 13 fibers, respectively."

In the rats stimulated individually at Heart 6-7 and Stomach 36-37, increased blood pressure levels were reduced an average of 44 percent and 39 percent, respectively. However, combined stimulation of two sets of acupoints "caused no additive or synergistic response" compared with electroacupuncture at one set of points alone.

In their conclusion, the scientists noted: "There are many methods of practicing acupuncture, possibly even as many variations in techniques as there are acupuncturists, with subtle or great differences between individual practices. The data in this study provide a greater understanding of several of these different therapeutic techniques used in clinical acupuncture to treat conditions associated with reflex sympathoexcitation and BP elevation."

In a follow-up interview, Dr. Longhurst said that while the type of procedure performed in the study could be used to treat patients with hypertension, it would not reduce standing blood pressure levels in otherwise healthy individuals. He added that his colleagues are currently testing the types of electroacupuncture used in the animal trial as part of an ongoing human study.

"This type of electroacupuncture is only effective on elevated blood pressure levels, such as those present in hypertension, and the treatment has no impact on standing blood pressure rates," Longhurst said. "Our goal is to help establish a standard of acupuncture treatment that can benefit everyone who has hypertension and other cardiac ailments."²

References

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