Animal-model research examines molecular mechanisms for blood-pressure lowering effect of ancient Chinese therapy

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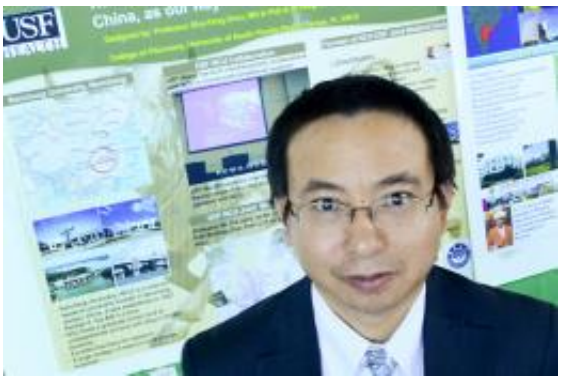

Dr. Shufeng Zhou led the USF-China acupuncture study.

(Medical Xpress)—An increase in antioxidant enzymes triggered by acupuncture appeared to play a role in reducing high blood pressure in hypertensive rats treated with the ancient Chinese therapy, a study by researchers at the University of South Florida College of Pharmacy and Guangzhou University of Chinese Medicine found.

The study findings were reported online last month in the biomedical journal *PLoS ONE*.

"The data clearly show that acupuncture can modulate the expression of enzymes involved in processes that may protect against free radical

damage to blood vessel walls," said Shufeng Zhou, MD, PhD, associate vice president of Global Medical Development at USF Health and professor and associate dean of International Research at the USF College of Pharmacy. "We need to know the molecular mechanisms for acupuncture to determine the best ways to use it."

Acupuncture has been an integral part of Chinese medicine for at least 2,500 years. Although still somewhat controversial in mainstream Western medicine, it has become one of the most widely practiced forms of alternative medicine in the United States. More than 2 million Americans report recent use of acupuncture for conditions ranging from chronic pain to osteoarthritis and migraines.

Acupuncture involves inserting very thin needles to stimulate various "acupoints" on the body associated with specific energy pathways or meridians. It's based on the theory that illness can result when the body's free flow of energy, called 'Qi' (pronounced 'chee'), becomes disrupted or blocked. Acupuncture is thought to restore health by restoring the body's energy balance.

In the USF-Guangzhou study, hypertensive rats that had been acclimated to gentle handling and blood pressure measurements were randomized to receive either acupuncture (performed by a Chinese doctor trained in acupuncture), a sham procedure, or no treatment at all.

For seven days the rats receiving acupuncture were administered a daily 5-minute treatment, which stimulated the "Taichong" acupoint located between the first and second metatarsal bones at top of the foot. The sham procedure followed the same protocol, including needle insertion, but the insertion point was not one of the precise sites prescribed by traditional Chinese medicine for treating blood pressure.

At the end of the study, the group of Taichong-treated rats had

significantly lower blood pressures than either the group receiving sham acupuncture or the untreated group. The reduction was not enough to bring the blood pressure down to normal levels.

The researchers also examined the part of the brain involved in regulating blood pressure. They found that decreased expression of seven proteins in the acupuncture-treated rats' brains was accompanied by an increase in six antioxidant enzymes.

The researchers suggest that the blood pressure-lowering effect of acupuncture may be partially explained by an overall decrease in cellular oxidative stress prompted by a boost in enzymes that help clear toxins called free radicals from the body. However, they emphasize more studies are needed to further investigate the effects of oxidative stress regulation by acupuncture in the long-term treatment of blood pressure.

More information: Lai, X., et al., Proteomic Response to Acupuncture Treatment in Spontaneously Hypertensive Rats. *PLoS ONE* 7(9): e44216. doi:10.1371/journal.pone.0044216.

Provided by University of South Florida