Deep Brain Stimulation Reduces Chronic Pain

The use of prescription opioid medicines to treat chronic pain is being reviewed as abuse of opioids has reached epidemic proportions with thousands of overdose-related deaths reported in the U.S. each year.

An alternative solution is to provide electrical stimulation of a deep, middle brain structure that blocks pain signals at the spinal cord level without drug intervention. The approach, studied by a University of Texas at Arlington research team appears promising.

Researches say that in addition to blocking pain, the electrical stimulation also triggers the release of beneficial dopamine, which may reduce the emotional distress associated with long-term pain.

“This is the first study to use a wireless electrical device to alleviate pain by directly stimulating the ventral tegmental area of the brain,” said Yuan Bo Peng, University of Texas psychology professor.

“While still under laboratory testing, this new method does provide hope that in the future we will be able to alleviate chronic pain without the side effects of medications.”

Peng and J.-C. Chiao, an electrical engineering professor, detail their discoveries in a new paper published in the journal *Experimental Brain Research*. Professor Xiaofei Yang, an electrical engineering professor at Huazhong University of Science and Technology in Wuhan, China also participated in the study.

New approaches for treating chronic pain are urgently needed.

Nearly two million Americans abused or were dependent on opioid medicines in 2014, and 165,000 died between 1999 and 2014 from overdoses related to opioid prescriptions, according to the Centers for Disease Control.

In their experiments, Peng and Chiao used their patented custom-designed wireless device to demonstrate that stimulation of the ventral tegmental area reduced the sensation of pain. They also confirmed that this stimulation reduced pain signals in the spinal cord, effectively blocking the perception of pain.

Morteza Khaledi, dean of the University of Texas’s College of Science, commended the researchers on this important work.

“Solutions for chronic pain are at the forefront of current medical research,” Khaledi said. “Dr. Peng and Dr. Chiao’s research is high-impact work focused on health and the human condition.

Due to difficult personal experiences with chronic pain, Chiao and Peng’s have worked for a decade to find a solution for chronic pain. Their innovative approach of devising advanced wireless implants helps individuals manage their pain as they go on with their lives.

Peng has specialized in pain relief throughout his career. He was a medical doctor and holds a doctorate in neuroscience from University of Texas Medical Branch in Galveston. He has held postdoctoral fellowships focused
on pain at Johns Hopkins Medical Institute, as well as the National Institute of Dental and Craniofacial Research, the National Institutes of Health, and the Department of Health and Human Services.

“Until this study, the ventral segmental area of the brain was studied more for its key role in positive reinforcement, reward and drug abuse,” said Peng. “We have now confirmed that stimulation of this area of the brain can also be an analgesic tool.”

Source: University of Texas, Arlington