A University of Texas (UTA) at Arlington research team has been working on an alternative solution to addressing chronic pain: electrical stimulation of deep brain structures under the cortex.

The group of investigators, led by UTA psychology professor Yuan Bo Peng, PhD, examined the process, which also triggers the release of dopamine, a neurotransmitter known to 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 (VTA) of the brain," Dr Yuan Bo Peng said in a statement. "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."

The study investigators analyzed "the effect of direct electrical stimulation of the VTA on mechanical, thermal and carrageenan-induced chemical nociceptive thresholds in Sprague–Dawley rats using our custom-designed wireless stimulator."

VTA stimulation alone did not show any change in mechanical or thermal thresholds, the researchers found. VTA stimulation reversed decreased mechanical and thermal thresholds induced by carrageenan injection in the hind paw contralateral to the stimulation site.
The investigators additionally recorded spinal cord dorsal horn neuronal responses to graded mechanical stimuli. They found that VTA stimulation significantly inhibited dorsal horn neuronal activity in responses to pressure and pinch from the paw, but not brush, which indicated that VTA stimulation may have exerted its analgesic effect through its connections with brain stem structures and cerebral cortex areas.

The Texas Norman Hackerman Advanced Research Program, Intel Corp. and the Texas Medical Research Collaborative funded the research with grants.

"We have now confirmed that stimulation of this area of the brain can also be an analgesic tool," Peng noted.

Reference


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