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New Non-Invasive Form of Vagus Nerve Stimulation Works to Treat Depression

Reports new study in Biological Psychiatry

Philadelphia, PA, February 4, 2016 – Depression can be a devastating and unremitting problem. Researchers of a new study published in the current issue of *Biological Psychiatry* report successful reduction of depressive symptoms in patients using a novel non-invasive method of vagus nerve stimulation, or VNS.

Despite the growing number of medications and neurostimulation approaches available, residual symptoms may be both distressing and disabling. Traditional vagus nerve stimulation (VNS) is a neurostimulation technique that has been used to alleviate treatment-resistant symptoms of depression. Clinical trials suggested that it produced modest benefit that emerged over long periods of time. However, it was also costly and required risky neurosurgery to implant the vagal nerve stimulators.

In this new study, Drs. Peijing Rong and Jiliang Fang at the China Academy of Chinese Medical Sciences, collaborating with Jian Kong's research team at Harvard Medical School, investigated a new, modified form of VNS called transcutaneous VNS, which instead stimulates the vagus nerve through electrodes clipped onto the ear, similar to how headphones rest inside the ear.

Patients with major depressive disorder who volunteered for the study received either transcutaneous VNS or sham (placebo) VNS and underwent a functional neuroimaging scan both before and after one month of treatment.

Compared to patients who received sham VNS, the patients who received real VNS showed significant improvement of their depressive symptoms. This improvement was associated with increased functional connectivity between the default mode network and precuneus and orbital prefrontal cortex, an important network in the brain known to be altered in depression.

"The transcutaneous approach may make this treatment for depression more accessible to people with depression, providing it proves to retain the efficacy of the more direct form of vagal nerve stimulation," said Dr. John Krystal, *Editor of Biological Psychiatry*.

Rong added, "This non-invasive, safe and low cost method of depression treatment can significantly reduce the severity of depression in patients and shows promise for future use."

The article is "[Transcutaneous Vagus Nerve Stimulation Modulates Default Mode Network in Major Depressive Disorder](#)" by Jiliang Fang, Peijing Rong, Yang Hong, Yangyang Fan, Jun Liu, Honghong Wang, Guolei Zhang, Xiaoyan Chen, Shan Shi, Liping Wang, Rupeng Liu, Jiwon Hwang, Zhengjie Li, Jing Tao, Yang Wang, Bing Zhu, and Jian Kong (doi: 10.1016/j.biopsych.2015.03.025). The article appears in *Biological Psychiatry*, Volume 79, Issue 4 (February 15, 2016), published by Elsevier.

Notes for editors

Full text of the article is available to credentialed journalists upon request; contact Rhiannon Bugno at +1 214 648 0880 or Biol.Psych@utsouthwestern.edu. Journalists wishing to interview the authors may contact Dr. Peijing Rong at +86 10 64089302 or drongpj@163.com, or Dr. Jiliang Fang at +86 136 833 38202 or fangmgh@163.com.

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