

Peripheral Nerve Stimulation for Tourette Syndrome

In the laboratory, median nerve stimulation reduced tic frequency and intensity and premonitory sensorimotor urges to tic.

Tourette syndrome (TS) is a neuropsychiatric disorder marked by involuntary tics, often associated with premonitory urges. Current treatments, including medications and psychological interventions, are often inadequate. Prior studies in TS patients have shown abnormalities in electroencephalographic signals in alpha or mu bands associated with sensorimotor function before tic execution and also that noninvasive brain stimulation can entrain brain oscillations and reduce tics. On the basis of these observations, investigators examined whether peripheral median nerve stimulation (MNS) might entrain specific mu oscillations linked to motor suppression and affect tic production.

They demonstrated that in healthy adults, rhythmic, but not arrhythmic, right MNS could entrain mu-band oscillations measured over the left sensorimotor cortex, and that this entrainment minimally affected volitional movement, attention, or cognition. Next, using a wristband-like device, 16 patients with TS (average age 22; 9 males; tic frequency, ≥ 1 /minute) received MNS to the right wrist; patients were video-recorded and reported their subjective experience. Overall, both tic frequency and intensity were significantly reduced during periods of stimulation, which corresponded with patients' subjective reports that MNS reduced their tics, their premonitory urge to tic, or both. Patients with more severe conditions tended to respond more favorably. Several noted that reductions in urges and tic frequency persisted after MNS.

COMMENT

Although controls were included to minimize chances that simple distraction might contribute to these effects, additional controls are needed (e.g., sham or left-sided stimulation). Nevertheless, these novel studies have both theoretical and practical implications. Such approaches might be applicable to investigate obsessive-compulsive disorder phenomena, such as premonitory urges. We might also expect clinical trials of Fitbit-type devices for reducing tic-associated symptoms. —*Joel Yager, MD*

Dr. Yager is Professor, Department of Psychiatry, School of Medicine, University of Colorado.

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