Targeted cognitive training benefits patients with severe schizophrenia

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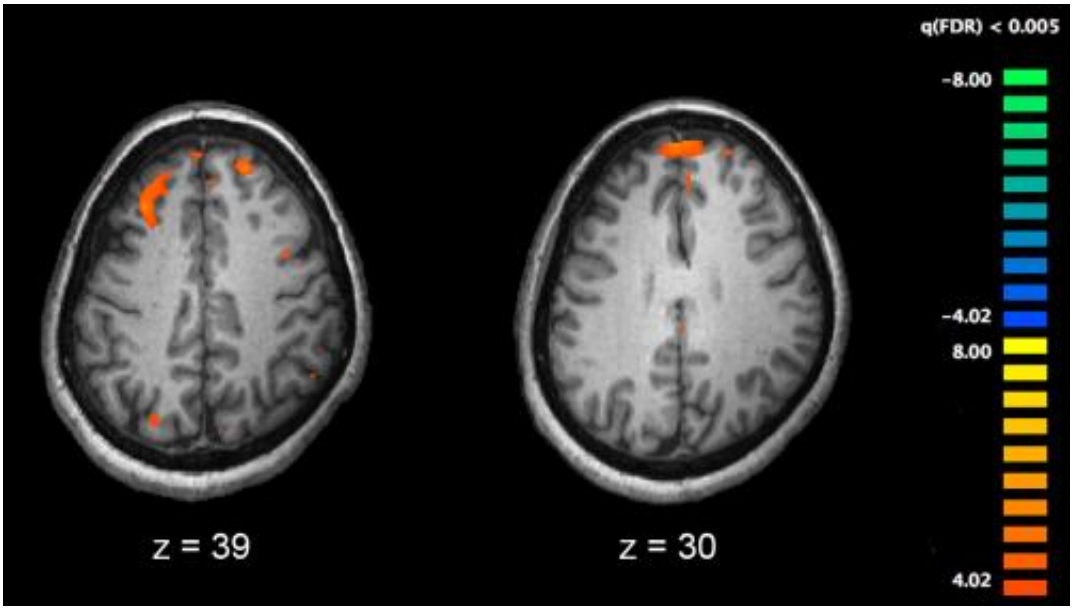

Functional magnetic resonance imaging (fMRI) and other brain imaging technologies allow for the study of differences in brain activity in people diagnosed with schizophrenia. The image shows two levels of the brain, with areas that were more active in healthy controls than in schizophrenia patients shown in orange, during an fMRI study of working memory. Credit: Kim J, Matthews NL, Park S./PLoS One.

Schizophrenia is among the most difficult mental illnesses to treat, in part because it is characterized by a wide range of dysfunction, from hallucinations and mood disorders to cognitive impairment, especially verbal and working memory, which can be explained in part by

abnormalities in early auditory information processing.

In recent years, targeted cognitive training (TCT) has emerged as a promising therapeutic intervention. TCT uses computerized training, such as sophisticated brain games, to target specific neural pathways, such as memory, learning and auditory-based senses, to beneficially alter the way they process information.

But while TCT has proven effective for mild to moderate forms of schizophrenia under carefully controlled conditions, it remains unclear whether the approach might benefit patients with chronic, refractory schizophrenia treated in non-academic settings, such as those cared for in locked residential rehabilitation centers.

In a study published in the December print issue of *Schizophrenia Research*, senior author Gregory A. Light, Ph.D., professor of psychiatry at UC San Diego School of Medicine and director of the Mental Illness, Research, Education and Clinical Center at Veterans Affaris San Diego Healthcare System, and colleagues investigated whether TCT improved auditory and verbal outcomes among the most difficult of schizophrenia patients.

"Chronic, treatment-refractory patients mandated to locked residential care facilities make up just a small subgroup of persons with schizophrenia, but they consume a disproportionately large share of mental health care resources," said Light. "Finding an effective therapy for them is critical."

Light's team studied 46 patients with schizophrenia psychosis recruited from a community-based residential treatment program, each following acute hospitalization. All were deemed "gravely disabled," unable to care for themselves, and under the guardianship of a private party or government agency. Participants were randomized to either standard

treatment-as-usual (TAU) or TAU plus TCT, in which they used laptop computers to perform various learning and memory game exercises, often involving auditory cues.

The researchers found that among participants who completed the roughly three months of TAU-TCT treatment, verbal learning and auditory perception scores improved; and severity of auditory hallucinations lessened. Of note: The benefits were not negatively impacted by age, clinical symptoms, medication or illness duration. "Our results suggest that chronically ill, highly disabled patients can benefit from TCT," said Light. "That contradicts current assumptions."

Light cited some caveats. "We're somewhere between the Wild West and golden age of cognitive training for schizophrenia patients. There is much still to be learned and done," he said. Patients in this study represented some of the most difficult patients to treat, with therapy regimens that are highly complex. "We need to do a lot more research."

Light and others are doing so. In a recent paper published in *Neuropsychopharmacology*, for example, he and colleagues described the underlying mechanism involved in TCT to improve auditory function. And in past work, schizophrenia-and-auditory-cues.aspx Light and others have shown that deficiencies in the neural processing of simple auditory tones can evolve into a cascade of dysfunctional information processing in the brains of patients with schizophrenia.

More information: Michael L. Thomas et al, Targeted cognitive training improves auditory and verbal outcomes among treatment refractory schizophrenia patients mandated to residential care, *Schizophrenia Research* (2018). DOI: 10.1016/j.schres.2018.07.025

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