

TBI study shows brain activity changes after cognitive rehabilitation

8 July 2015

Kessler Foundation researchers published results of their TBI-MEM trial, the first study to demonstrate significant changes in cerebral activation after memory retraining in individuals with traumatic brain injury (TBI). The article, "Examining the efficacy of the modified Story Memory Technique (mSMT) in persons with TBI using functional magnetic resonance imaging (fMRI): The TBI-MEM Trial" was published on July 8 by the *Journal of Head Trauma Rehabilitation*. The authors are Nancy Chiaravalloti, PhD, Ekaterina Dobryakova, PhD, Glenn Wylie, DPhil, and John DeLuca, PhD, of Kessler Foundation.

Eighteen participants with moderate to severe TBI were assigned to either the treatment (n=9) or [placebo group](#) (n=9). All underwent neuropsychological assessment, cognitive ability assessment and functional [magnetic resonance imaging](#) (fMRI) during a learning task before and after treatment. The treatment group was administered the modified Story Memory Technique (mSMT), a 10-session memory retraining protocol based on visualization and context; the placebo group underwent memory exercises without visualization or context training. fMRI findings showed a pattern of changes in cerebral activation in the mSMT treatment group. This is consistent with the researchers' findings in a prior study of mSMT in patients with MS, which provided the first Class I evidence for the efficacy of cognitive rehabilitation in MS. (Chiaravalloti N, et al: An RCT to treat learning impairment in MS. *Neurology* 2013(81) [DOI: 10.1212/01.wnl.0000437295.97946.a8S.](#))

"This is the second study we have conducted that shows significant changes in activation patterns on neuroimaging after behavioral memory intervention," said Nancy Chiaravalloti, PhD, director of Neuroscience & Neuropsychology and Traumatic Brain Injury (TBI) Research at Kessler Foundation. "These changes likely reflect increased brain efficiency and decreased task

difficulty after training with mSMT. Memory deficits are a major cause of disability after TBI. Identifying effective cognitive interventions is critical to improving quality of life in this population."

The mSMT protocol has been translated into Spanish and is being used in the U.S., Mexico, and Argentina. A Chinese translation has also been completed for use in upcoming studies.

More information: [DOI: 10.1097/HTR.000000000000164](#)

Provided by Kessler Foundation

APA citation: TBI study shows brain activity changes after cognitive rehabilitation (2015, July 8) retrieved 4 May 2021 from <https://medicalxpress.com/news/2015-07-tbi-brain-cognitive.html>

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