

# Age-related GABA decline is associated with poor cognition

January 17 2017

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Diminishing levels of GABA, the primary inhibitory neurotransmitter in the brain, may play a role in cognitive decline as we age, according to a study published in *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*. The study, led by Ronald Cohen of University of Florida's Center for Cognitive Aging and McKnight Brain Institute, shows an association between higher GABA concentrations in the frontal lobe, a brain region important for complex cognitive functioning, and superior performance on a cognitive test in healthy older adults.

The findings help researchers understand the potential role of age-related GABA decreases in [cognitive](#) decline and suggest that declining frontal GABA concentrations may help predict neurodegenerative disease.

"These results are an important step towards personalized approaches to age-related cognitive interventions," said first author Eric Porges, of the University of Florida department of clinical and health psychology in the College of Public Health and Health Professions, and a member of UF's Center for Cognitive Aging and McKnight Brain Institute.

The cause of the relationship remains unknown, and the cognitive assessment used in the study cannot pinpoint which specific cognitive domains, such as attention or memory, might be affected by declining GABA concentrations. However, the relationship suggests a potentially fruitful target for new treatments.

"Interventions that increase GABA levels (such as exercise) could

potentially offset these changes, and this paper opens up a pathway for investigating this exciting possibility," said Cameron Carter, Editor of *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*.

Ninety-four healthy older adults (average age of 73 years) who participated in the study completed the Montreal Cognitive Assessment, which probes several domains of cognition. Porges and colleagues also measured GABA concentrations in the frontal and posterior cortices of each participant to target regions that are important for high level cognitive functioning.

The analysis supports previously reported GABA reductions during healthy adulthood and revealed that GABA concentrations continue to diminish in both regions into advanced age. The analysis also revealed an association between reduced GABA concentrations in the frontal lobe and poor test scores. This relationship existed even after controlling for age-related changes in cognitive function and tissue atrophy.

"To find that, independent of age and tissue atrophy, GABA levels predict individual differences in cognitive outcome is a provocative finding that may provide insight into physiological mechanisms of age-related [cognitive decline](#)," said Porges.

The relationship between GABA concentration and MoCA score was not found in the posterior region, indicating the effect on cognition is specific to reductions in the [frontal lobe](#) rather than brain-wide changes in GABA concentrations.

**More information:** Eric C. Porges et al. Frontal Gamma-Aminobutyric Acid Concentrations Are Associated With Cognitive Performance in Older Adults, *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* (2017). [DOI: 10.1016/j.bpsc.2016.06.004](#)

Provided by Elsevier

Citation: Age-related GABA decline is associated with poor cognition (2017, January 17)  
retrieved 26 April 2024 from

<https://medicalxpress.com/news/2017-01-age-related-gaba-decline-poor-cognition.html>

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