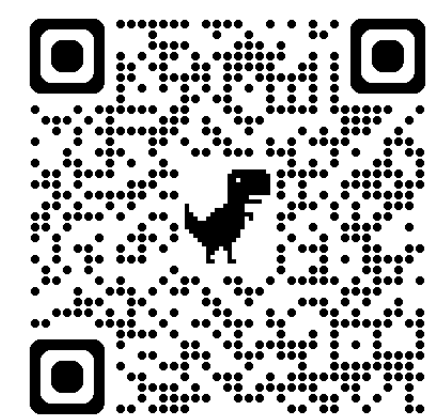


Association Between Triglyceride-Glucose Index Variability And Midlife Cognitive Function Varies By Obesity Status



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Key Takeaway: Higher long-term TyG variability from childhood is associated with poorer midlife cognition, but the affected domain differs by obesity status.

INTRODUCTION	METHODS	RESULTS	CONCLUSIONS	REFERENCES
Higher levels of the triglyceride-glucose index (TyG), a non-invasive marker of insulin resistance, have been associated with higher dementia risk. Whether long-term variability in TyG affects cognitive function remains unclear. Although the effects of peripheral insulin resistance on the brain may differ by obesity status, this possibility has not been examined in the context of long-term TyG variability.	Study population: The Bogalusa Heart Study (BHS) - F/U of vascular risk factors from childhood >50 yrs Exposure: TyG variability $TyG = \ln[(\text{triglyceride} * \text{glucose})/2]$ • ≥ 3 TyG measures fitted to linear mixed effects models - variability indices: deviation from age-predicted values (DEV) and residual SD (RSD) - DEV and RSD :mean and SD of the residuals, which measure variability around the slope Cognitive outcomes: global cognitive score (GCS) + 3 domains: derived from 8 neuropsychological tests Stratified by midlife obesity (BMI ≥ 30) Adjusted for life-course mean TyG + covariates	N = 1,013; mean age: 48 years; mean follow-up: 36 years (34% Black, 61% women) Individuals with obesity: higher TyG variability associated with poorer GCS but not with cognitive domains GCS Episodic memory Executive function Attention/processing speed Individuals without obesity: higher TyG variability associated with poorer episodic memory but not with GCS or other domains GCS Episodic memory Executive function Attention/processing speed	- Elevated TyG variability from childhood may be a risk factor for future cognitive dysfunction independent of the life-course mean TyG with differential effects by obesity status. - Insulin resistance may impair learning and memory through endothelial dysfunction, inflammation, and disrupted neurotransmitter signaling affecting hippocampal synaptic plasticity. - Obesity and TyG variability may have overlapping mechanisms influencing cognitive domain performance, which could explain why the association between TyG variability and episodic memory performance was attenuated in the obesity group.	Wei, J., Wu, X., Chen, L. <i>et al.</i> Association of TyG index and obesity indicators with cognitive function: a cross - sectional study from Chinese health check-up centers. <i>BMC Endocr Disord</i> 26, 169 (2026). Feng S, Zhang Z, Gao Q, et al. Different association between triglyceride-glucose index and mild cognitive impairment in type 2 diabetes mellitus patients with and without diabetic kidney disease. <i>Front Nutr.</i> 2025 Nov 12;12:1681164. Du T, Fernandez C, Barshop R, Fonseca V, Chen W, Bazzano LA. Variabilities in Childhood Cardiovascular Risk Factors and Incident Diabetes in Adulthood: The Bogalusa Heart Study. <i>Diabetes Care.</i> 2019 Sep;42(9):1816-1823. doi: 10.2337/dc19-0430. Epub 2019 Jul 18.
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