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Higher normal fasting plasma glucose is associated with hippocampal atrophy

The PATH Study

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[+ SHOW AFFILIATIONS](#) | [+ SHOW FULL DISCLOSURES](#)Correspondence & reprint requests to Dr. Cherbuin nicolas.cherbuin@anu.edu.audoi: <http://dx.doi.org/10.1212/WNL.0b013e31826846de>

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[Abstract](#)[Full Text](#)[Full Text \(PDF\)](#)Also available: [Figures Only](#) [Data Supplement](#) [PPT Slides of All Figures](#)**ABSTRACT**

Objectives: Substantial evidence showing an association between type 2 diabetes (T2D) and cerebral atrophy, cognitive impairment, and dementia is accumulating. However, relatively little is known about the subclinical effects of high plasma glucose levels within the normal range. The aim of this study was to investigate the association between plasma glucose levels and hippocampal and amygdalar atrophy in a sample of 266 cognitively healthy individuals free of T2D, aged 60–64 years, taking part in a longitudinal study of aging.

Methods: Fasting plasma glucose was assessed at wave 1. Hippocampal and amygdalar volumes were manually traced on 1.5 T MRI scans collected at wave 1 and at wave 2 4 years later. General linear model analyses were used to assess the relationship between plasma glucose and incident medial temporal lobe atrophy after controlling for a range of sociodemographic and health variables.

Results: Plasma glucose levels were found to be significantly associated with hippocampal and amygdalar atrophy and accounted for 6%–10% in volume change after controlling for age, sex, body mass index, hypertension, alcohol, and smoking.

Conclusions: High plasma glucose levels within the normal range (<6.1 mmol/L) were associated with greater atrophy of structures relevant to aging and neurodegenerative processes, the hippocampus and amygdala. These findings suggest that even in the subclinical range and in the absence of diabetes, monitoring and management of plasma glucose levels could have an impact on cerebral health. If replicated, this finding may contribute to a reevaluation of the concept of normal blood glucose levels and the definition of diabetes.

FOOTNOTES

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