proceedings

MDPI

Abstract

Associations of Circulating Gamma-Linolenic Acid and Cardiometabolic Health in Chinese Adults: A Prospective Study †

Yu-Ming Chen *, Hai-Li Zhong, Yan Yan, Ying-Di Yang, Hang-Zhu Chen and Ting-Yu Sun

Department of Epidemiology, School of Public Health, Sun Yat-sen University, Guangzhou 510080, China; zhonghli@mail2.sysu.edu.cn (H.-L.Z.); yany36@mail2.sysu.edu.cn (Y.Y.); yangyd39@mail2.sysu.edu.cn (Y.-D.Y.); chenhz9@mail2.sysu.edu.cn (H.-Z.C.); sunty6@mail2.sysu.edu.cn (T.-Y.S.)

* Correspondence: chenyum@mail.sysu.edu.cn

† Presented at the 14th European Nutrition Conference FENS 2023, Belgrade, Serbia, 14–17 November 2023.

Abstract: Background: Previous studies have shown that dietary and circulating n-6 polyunsaturated fatty acids (n-6 PUFAs) have beneficial associations with cardiometabolic health in humans. However, some studies showed inconsistent associations between circulating gamma-linolenic acid (GLA, C18:3 n-6), a metabolite of linoleic acid (LA, C18:2 n-6), and cardiometabolic health compared to LA. Therefore, this study aimed to examine the associations of erythrocyte GLA proportions with the presence and incidence of cardiometabolic diseases in Chinese adults. Methods: This prospective study included 3591 participants (40–80 years) from the Guangzhou Nutrition and Health Study, South China. The participants were recruited from 2008 to 2013 and followed up every 3 years. Erythrocyte fatty acids were determined using the baseline samples. Assessments of metabolic syndrome (MetS), carotid intima-media thickness, blood lipids, and questionnaire interviews were conducted at each visit. The associations between erythrocyte GLA and the presence and incidence of MetS, carotid artery plaque (CAP), and coronary heart diseases (CHD) were analyzed using logistic and Cox regression models after adjusting for potential covariates. Results: Among the 3591 participants at baseline, 1155, 941, and 417 had MetS, CAP, and CHD, which were included in the cross-sectional analyses. After a median of a 9-year follow-up, 935/2436, 1172/2203, and 524/2507 participants (case N/total N followed up) developed MetS, CAP, and CHD and were included in the prospective analyses, respectively. Multivariate-adjusted odds ratios (ORs) and 95% confidence intervals (95% CIs) of MetS, CAP, and CHD for the quartile (Q) 4 (vs. 1) of GLA were 3.11 (2.50, 3.87), 1.25 (0.99, 1.58), and 1.54 (1.12, 2.13) (all p-trends < 0.05). The corresponding hazard risks (HR) and 95% of the CIs of the 9-year incidences were 1.45 (1.20, 1.75), 1.25 (1.06, 1.48), and 1.40 (1.10, 1.80) (all p-trends < 0.05), respectively. However, LA showed beneficial associations with MetS presence (Q4 vs. Q1, OR: 0.65, 95% CI: 0.53, 0.80) and the 9-year CAP incidence (Q4 vs. Q1, HR: 0.78, 95% CI: 0.66, 0.92) (p-trends < 0.01). Conclusions: Our findings show a detrimental association between erythrocyte GAL and the presence and incidence of MetS, CAP, and CHD in Chinese adults. Experimental studies are needed to confirm the causal relationship.

Keywords: gamma-linolenic acid; metabolic syndrome; carotid artery plaque; coronary heart diseases; prospective study

check for updates

Citation: Chen, Y.-M.; Zhong, H.-L.; Yan, Y.; Yang, Y.-D.; Chen, H.-Z.; Sun, T.-Y. Associations of Circulating Gamma-Linolenic Acid and Cardiometabolic Health in Chinese Adults: A Prospective Study. *Proceedings* **2023**, *91*, 121. https://doi.org/10.3390/proceedings2023091121

Academic Editors: Sladjana Sobajic and Philip Calder

Published: 12 January 2024

Author Contributions: Study conception and design: Y.-M.C.; Obtaining funding: Y.-M.C.; Acquisition of data: H.-L.Z., Y.Y., Y.-D.Y., H.-Z.C., and T.-Y.S.; Data analysis and interpretation: H.-L.Z. and Y.-M.C. Writing of report: Y.-M.C. All authors have read and agreed to the published version of the manuscript.

Funding: This study was jointly supported by the National Natural Science Foundation of China (No. 82073546).

Institutional Review Board Statement: This study was approved by the Ethics Committee of the School of Public Health at Sun Yat-Sen University with the approval code [2018] 048.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data is unavailable due to privacy or ethical restrictions.

Conflicts of Interest: The authors declare no conflict of interest.