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Brain coordination and the association with diet in prediabetes

Yi-Cheng Hou¹, Jiun-Rong Chen¹, Shwu-Huey Yang¹, Yu-Te Wu², Cheng-yu Chen³ and Chien-Han Lai²

¹Taipei Medical University, Taiwan

²National Yang-Ming University, Taiwan

³Taipei Tzu Chi Hospital, Taiwan

The functional connectivity of diabetes can help us explain the brain function decline in hyperglycemic status. However, the issue has not been addressed much in prediabetes. Therefore, we designed this study to investigate the inter-hemispheric coordination in the prediabetes. 64 prediabetic patients and 54 controls were enrolled in this protocol. They received the structural and resting-state functional magnetic resonance imaging screen. The imaging data were preprocessed and analyzed to obtain voxel-mirrored homotopic connectivity (VMHC), which can measure inter-hemispheric coordination. The VMHC values were compared between two groups with age and gender as covariates. The controls had higher VMHC values than prediabetic patients in bilateral anterior cingulate cortex. The prediabetic patients had higher VMHC values than controls in bilateral middle frontal gyrus. The VMHC values were also negatively correlated with pre-prandial serum glucose level in inferior frontal gyrus of prediabetic patients. In addition, the VMHC values of prediabetic patients were negatively correlated with total carbohydrate and calorie intake in anterior cingulate cortex. The inter-hemispheric coordination in anterior sub-network of default mode network and fronto-cingulate regions would play a role in the pathophysiology of prediabetes. The diet impact on the inter-hemispheric coordination is also an interesting issue.

anny321@tmu.edu.com