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The Interaction between Iron and Nε-(carboxymethyl)lysine and its association with non-alcoholic fatty liver disease

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Background: Dysregulated iron metabolism is a common disorder in non-alcoholic fatty liver disease (NAFLD). Recently, the advanced glycation end products (AGEs) and it's receptors (RAGE) are also linked to the pathogenesis of NAFLD. The aim of this study was to investigate the interactive effects of iron-AGE axis on fatty liver severity.

Methods: NAFLD was diagnosed based on abdominal ultrasonography. In total, 170 Taiwanese adults (33 controls and 137 NAFLD) were selected for analysis. Parameters for RBC, iron status, soluble CD163 (sCD163), cell free hemoglobin (Hb) and Nε-(carboxymethyl) lysine (CML) were evaluated.

Results: Multivariate linear regression analysis confirmed that serum free Hb (Beta=-1.1(-1.4--0.74); p<0.0001) and soluble CD163 (Beta=0.053 (0.01-0.09); p<0.05) are independent predictors of serum CML. Interactive analysis showed that, compared to those with the lowest sCD163 (T1) and free Hb (T1), individuals with the highest free Hb tertile (T3) and the lowest sCD163 tertile (T1) had an negative predicting effect on serum CML (Beta= -93.136 (-185.1—1.177); p =0.047) and the inverse relationship changes with increasing tertile groups of sCD163 (Beta=-46.54 (-139.2-46.1) and 65.1 (-12.6-142.84) for T2 and T3, respective; p-trend=0.011). Categorical logistic regression analysis showed that, compared to individuals with the lowest serum free Hb and CML median (M1, Reference), individuals with the highest serum CML (M2) and free Hb (M2) had 6.86 times (95% CI: 1.85-125.4; p=0.004) times highest risk for NAFLD and the odds increased to 8.66 times (95%CI: 1.684- 44.48; p=0.01) after adjusting for age, gender and BMI.

Conclusion: Our results raise the possibility that increased shedding of CD163 surface receptor may interfere with CD163+macrophage's ability to recycle serum free Hb and increased free Hb level may lead to the endogenous formation of CML and liver injury.

Biography

Nindy Sabrina is a second year master student in the School of Nutrition and Health Sciences, Taipei Medical University, Taiwan. Nindy is originally from Malang, Indonesia. She received her undergraduate education at Brawijaya University, Indonesia, with a degree in Nutrition and Health. Currently, she is actively involved in Indonesia Student Association in Taiwan. Nindy is broadly interested in human nutrition research particularly obesity, iron, and advanced glycation end products. In her master research, she is seeking to understand the relationships between dietary intake, serum iron biomarkers and advanced glycation end products in Non-Alcoholic Fatty Liver Disease (NAFLD) patient in Taipei.

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