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Study on Serum Phospholipids Fatty Acid Composition in Newly Diagnosed Thai Type 2 Diabetes

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Objective: Recent reports indicated that alterations in plasma fatty acid composition by dietary lipids are associated with insulin resistance and T2DM. The calculated desaturase activities are proposed to be an emerging risk factor for metabolic syndrome. This study aimed to examine the pattern of fatty acid composition in serum phospholipids of newly diagnosed Thai T2DM compared with healthy controls.
Materials and Methods: 16 newly diagnosed Thai T2DM (onset of diabetes < 2 years) and 16 healthy control were recruited and fasting plasma samples were obtained to measure serum phospholipids fatty acid composition. D9D activities were calculated as the ratio of steric/oleic ratio and palmitoleic/palmitic ratio. D6D activities were calculated as the ratio of γ-linoleic/linoleic and arachidonic/dihomo-gamma-linolenic (DGLA).
Results: Our data showed that serum free fatty acids were higher in T2DM especially palmitic, palmitoleic, oleic and DGLA. The activities of D9D (18:1/18:0), D9D (16:1/16:0) and D6D (18:3/18:2) in serum phospholipids were higher than in healthy controls. The D9D (16:1/16:0) activity was correlated with fasting glucose (r=0.390, p-value 0.030), C-peptide (r=0.419, p-value 0.019), glucagon (r=0.422, p-value 0.018) in newly diagnosed Thai T2DM but not insulin (r=0.328, p-value 0.071).
Conclusions: High concentrations of long-chain free fatty acid (16:0, 16:1, and 20:3 n-6) along with increasing in activities of D9D and D6D were observed in newly diagnosed Thai T2DM. Whether these distinct changes reflect the potential role of some plasma fatty acid composition in the pathogenesis of Thai T2DM or merely the effects of dietary intake should be confirmed in the future study.