

Effect of alpha-lipoic acid on hepatic insulin signaling-related proteins expression in high fat diet plus streptozotocin-induced diabetic ratsSzu-Chuan Shen¹, Cho-Hua Yang¹, Wen-Chang Chang², Shih-Xiang Lin¹, Rong-Shiuan Tu¹, James Swi-Bea Wu³ and Yu-Wen Ting³¹National Taiwan Normal University, Taiwan²National Chiayi University, Taiwan³National Taiwan University, Taiwan

Type 2 Diabetes Mellitus (T2DM) is a metabolic disorder disease and characterized as insulin resistance. Alpha-lipoic acid (ALA) which acts as a cofactor for pyruvate dehydrogenase and α -keto-glutamate dehydrogenase in TCA cycle is a potent biological antioxidant. This study aims to investigate the effect of ALA on ameliorating insulin signaling pathway in High Fat Diet (HFD) plus Streptozotocin (STZ) induced diabetic rats. Male Wistar rats fed HFD (60% fat of calorie) for four weeks were Intraperitoneally (IP) injected STZ (30 mg/kg B.W.) and then served HFD for 8 weeks continuously to induce diabetes. The diabetic rats were orally administered with ALA (200 mg/kg B.W.) once a day for 13 weeks. The serum biochemistry values of rat were measured using ELISA method. The hepatic insulin signaling-related protein expressions were analyzed by western blotting. The results show that the treatment of ALA for 13 weeks significantly reduced fasting serum glucose level in HFD/STZ induced diabetic rats ($p < 0.05$). Furthermore, the fasting serum lipid profiles such as triglyceride and total cholesterol values were decreased, whereas, the high density lipoprotein value was increased significantly in ALA treated diabetic rats ($p < 0.05$). Moreover, western blotting analysis indicates that ALA significantly increased hepatic insulin signaling-related proteins such as insulin receptor, PI3K and Akt/Pak expressions in diabetic rats. The above observations demonstrate that ALA may ameliorate hepatic insulin resistance via enhancing PI3K/Akt pathway-related protein expressions and has potential on preventing progression of T2DM.

Biography

Szu-Chuan Shen has completed his PhD from National Taiwan University. He is the Vice-Chair of undergraduate and graduate programs of Nutrition Science, National Taiwan Normal University. He has published more than 30 papers in reputed journals and has been serving as an Editorial Board Member of reputed.

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