

Abstract Type : Oral

Abstract Submission No. : 1429

Chronic high-fat feeding promotes abnormal lipid metabolism and tissue damage in a single kidney.

You-Jin Kim¹, Se-Hyun Oh¹, Jeong-Hoon Lim¹, Jang-Hee Cho¹, Chan-Duck Kim¹, Sun-Hee Park¹, Tae-Hwan Kwon², Yong-Jin Kim³, Yong-Lim Kim¹

¹Department of Internal Medicine, School of Medicine, Kyungpook National University, Korea, Republic of

²Department of Biochemistry and Cell Biology, School of Medicine, Kyungpook National University, Korea, Republic of

³Department of Pathology, Kyungpook National University Hospital, Korea, Republic of

Objectives: Obesity induces abnormal lipid metabolism, leading to metabolic diseases. Abnormal lipid metabolism has been reported as an independent risk factor for renal injury, and synergistic effects in unilateral kidney promote changes in gene expression associated with renal injury. However, the correlation between obesity-induced lipid metabolism abnormalities and renal damage in a single kidney has not been elucidated.

Methods: To determine lipid metabolism and renal function in unilateral kidney with obese mice, mice were randomized to undergo unilateral nephrectomy and fed standard or high-fat diets for 13 weeks. There were four groups; normal diet (ND), high-fat diet (HD), normal diet and received uninephrectomy (NDU), and high-fat diet and received uninephrectomy (H DU). In vitro, podocytes were treated with cholesterol ester for 24 hours, and cell function and protein expression were confirmed.

Results: In unilateral kidney, kidney function decreased regardless of diet, but lipid accumulation and renal injury were promoted in kidney of H DU group compared to HD group. As a result of protein analysis, it was confirmed that H DU group had reduced expression of proteins involved in fatty acid oxidation and efflux, increased expression of cholesterol synthesis-related proteins, abnormal autophagy-related protein expression, mitochondria damage, and increased fibronectin. In podocytes, cholesteryl ester causes cellular dysfunction, lipid accumulation and abnormal lipid metabolism, leading to cell damage by lipotoxicity.

Conclusions: Long-term high-fat diet induces abnormalities of lipid metabolism in a unilateral kidney model, leading to increased lipid accumulation and accelerates deterioration of kidney function with lipotoxicity.