

Abstract Type : Oral

Abstract Submission No. : OR-1326

Alterations in lipid profile of the aging kidney identified by MALDI imaging mass spectrometry

Sang Ho Lee¹, Su-Mi Kim¹, Ju-young Moon¹, Yang-Gyun Kim¹, Su-Woong Jung¹, Dong-Jin Kim¹, Sue-Ah Noh², Kwang-Pyo Kim²

¹Department of Internal Medicine-Nephrology, Kyung Hee University Hospital at Gangdong, Korea, Republic of

²Department of Kyung Hee Medical Science Research Institute, Kyung Hee University School of Medicine, Korea, Republic of

Objectives: During aging, the kidney undergoes functional and physiological changes that are closely affiliated with chronic kidney disease (CKD). There is increasing evidence supporting the role of lipid or lipid-derived mediators in the pathogenesis of CKD and other aging-related diseases.

Methods: To understand the role of lipids in various metabolic processes during kidney aging, we conducted MALDI imaging mass spectrometry (MALDI-IMS) analysis in kidneys harvested from young (2 months old, n=3) and old mice (24 months old, n=3).

Results: MALDI-IMS analysis showed an increase in ceramide level and a decrease in sphingomyelin (SM) and phosphatidylcholine (PC) levels in kidneys of old mice. The increased expression of cPLA2 and SMPD1 protein in aged kidney was confirmed by immunohistochemistry and western blot analysis. Our MALDI-IMS data showed the altered distribution of lipids in aged kidney as indicative of aging-related functional changes of the kidney.

Conclusions: Combined analysis of MALDI-IMS and IHC confirmed lipidomic changes and expression levels of responsible enzymes as well as morphological changes.

Fig: The component regions of the kidney and representative IMS images.

