

Abstract Submission No. : 2250

PTEN-induced kinase 1 has association with renal aging in the context of inflammatory response

Jung Sang Hyun, Ha Min Heui, Sung Min Ji, Lee So Young, Lee Yu Ho, Lim Song Hee, Yang Dong Ho, An Hyun Ju, Jeong Hye Yun
Department of Internal Medicine-Nephrology, Bundang CHA General Hospital, Korea, Republic of

Objectives: Among several changes of aging-related human organ system, progressive functional and structural deterioration of kidney is the most dramatic phenomenon, and the role of mitophagy has recently considered important in pro-aging process in CKD patients. PTEN-induced kinase 1 (PINK1), known to be associated with age-related disease like Parkinson disease or Alzheimer disease regulates mitochondrial dysfunction, oxidative stress and subsequent apoptosis. To enhance understanding the function of PINK-1 on aging, we compared whole-kidney RNA sequencing between naturally aging mice (24-month-old) and PINK1 knock out aging mice.

Methods: Kyoto Encyclopedia of Genes and Genomes pathway analysis and gene ontology analysis were performed for gene expression analysis. To investigate the role of PINK1 on aging, we used Pink1-deficient mice and PINK1-overexpressing HKC8.

Results: Compared to naturally aging kidneys, PINK1 knock out aging mice showed prominent expression of the genes related to cytokines, defense response, immune system response, and inflammation. We also investigated the function of PINK1 on in vivo model of aging mice and PINK1 (-/-) aging mice. PINK1 deficiency showed aggravated tubulointerstitial fibrosis on PAS staining, and the Urinary Albumin-Creatinine Ratio increased more prominently according to aging in PINK1 (-/-) mice. The Quantitative PCR analysis validated that the expression of genes associated with aging, fibrosis, and inflammation increased in PINK1 (-/-) mice compared to age-matched controls. Under treatment with H₂O₂, the expression of aging marker p21 and pro-inflammatory marker IL-6 decreased in PINK1-overexpressing HKC8 compared to naturally aging mice.

Conclusions: In conclusion, our results suggest that PINK1 deficiency contributes to renal aging process via proinflammatory change in the kidney.