KSN 2019
Seoul, Korea · May 23 - 26

Abstract Type : Poster
Abstract Submission No. : PO-1242

Acute kidney injury sensitivity in diabetic murine model

Sang Heon Song[1], Sang Soo Kim[2], Min Young Lee[3], You Hyun Jeon[1], Miyeun Han[1], Harin Rhee[1], Eun Young Seong[1], Il Young Kim[4], Dong Won Lee[4], Soo Bong Lee[4]
[1]Department of Internal Medicine-Nephrology, Pusan National University Hospital, Korea, Republic of
[2]Department of Internal Medicine-Endocrine, Pusan National University Hospital, Korea, Republic of
[3]Department of Biomedical research institute, Pusan National University Hospital, Korea, Republic of
[4]Department of Internal Medicine-Nephrology, Pusan National University Yangsan Hospital, Korea, Republic of

Objectives: Diabetes can upregulate two discrete isoforms of the MMP-2 (full length and N-terminal truncated, FL-MMP-2, NTT-MMP-2) in renal tubules and especially, inducible NTT-MMP-2 could be related to renal tubular damage. Also, pyrrolidinedithiocarbamate (PDTC), NF-Kb inhibitor, can suppress NTT-MMP-2 selectively. This study was conducted to analyze the effects of acute kidney injury on diabetic animal model and test the effect of PDTC in acute kidney injury with diabetes.

Methods: We performed unilateral ischemia-reperfusion injury (uIRI) in streptozotocin-induced diabetic animals as a model of acute kidney injury and followed for 48hrs and six weeks. Mice were randomized into four groups as follows; control (A), non-DM+uIRI (B), DM+uIRI (C), DM+uIRI+PDTC (D).

Results: In a 48hr experiment, tubular necrosis was more severe in diabetic IR kidney compared with non-diabetic IR kidney. Outer medulla in group C was becoming devastated and led to the extensive coagulative necrosis. Those findings were diminished by PDTC. Peritubular capillary density was increased by PDTC and cortical macrophage density was decreased by PDTC compared to group B and C. The nitrotyrosin was lesser expressed by PDTC compared to group B and C. In a six week experiment, IRI caused the kidney to be stiffen and shrink both in group B and C and PDTC can ameliorate these gross changes compared to group C. Peritubular capillary density was increased by PDTC compared to group C. Cortical macrophage density was higher than group B and D and PDTC ameliorate the recruitment of macrophage in renal cortex. The expression of cleaved caspase-3/caspase 3 in group C was higher than group B and D.

Conclusions: Ischemia-reperfusion injury caused more intense renal damage in diabetic murine model and could lead to chronic renal change related to inflammation and apoptotic pathway. These changes may be mitigated by PDTC treatment associated with anti-oxidative mechanism and inhibition of NTT-MMP-2.