KSN 2020
FULLY VIRTUAL MEETING

Abstract Type : Poster
Abstract Submission No. : PO-1721

The Deletion of Akt1 attenuates renal fibrosis and tubular epithelial-mesenchymal transition during acute kidney injury to chronic kidney disease progression

Il Young Kim[1], Hye Jung Kim[1], Nan Young Lee[1], Byung Min Ye[1], Min Jeong Kim[1], Seorin Kim[1], Dong Won Lee[1], Soo Bong Lee[1], Eun Young Seong[2], Sang Heon Song[2]
[1]Department of Internal Medicine-Nephrology, Pusan National University Yangsan Hospital, Korea, Republic of
[2]Department of Internal Medicine-Nephrology, Pusan National University Hospital, Korea, Republic of

Objectives: Acute kidney injury (AKI) is an underestimated, yet important risk factor for the development of chronic kidney disease (CKD), which is characterized by tubulointerstitial fibrosis and tubular epithelial-mesenchymal transition (EMT). Akt has been reported to be involved in renal fibrosis and EMT. Thus, we investigated the role of Akt1, one of the three Akt isoforms, in the murine model of AKI to CKD progression.

Methods: We subjected the wild type and *Akt1*$^{-/-}$ mice to unilateral ischemia-reperfusion injury (UIRI). UIRI was induced by clamping the left renal artery for 30 min followed by reperfusion. After 6 weeks of UIRI, the renal fibrosis and EMT were assessed by histology, immunohistochemistry, and western blot.

Results: After 6 weeks after UIRI, we found that Akt1, not Akt2 or Akt3, was activated in UIRI-kidney. The tubulointerstitial fibrosis was significantly alleviated in *Akt1*$^{-/-}$ mice compared with the wild type (WT) mice. Besides, the deletion of Akt1 decreased the expression of the vimentin and α-SMA and increased the expression of E-cadherin, indicating the suppression of tubular EMT. However, there was no difference in the activity of TGF-β1/Smad signaling, which is the potent inducer of renal fibrosis and EMT, between WT mice and *Akt1*$^{-/-}$ mice. The deletion of Akt1 also increased the GSK-3β activity and decreased the expression of β-catenin, Snail, and twist1.

Conclusions: Our findings demonstrate that the deletion of Akt1 attenuates the renal fibrosis and tubular EMT independently of TGF-β1/Smad signaling during the AKI to CKD progression. Akt1 may be the therapeutic target against the AKI to CKD progression.