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Protective effects of anti-fibrotic gene administration on unilateral ureteral obstruction-induced kidney fibrosis in mice

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Objectives: Kidney fibrosis has important therapeutic implications for patients with chronic kidney disease (CKD). Unilateral ureteral obstruction (UUO) is a representative experimental model of renal injury leading to tubulointerstitial fibrosis. TGF-b1 is a main contributor in renal inflammation and fibrosis. Anti-fibrotic gene (Anti-F) is known as a negative regulator of TGF-b1. We investigated the effects of Anti-F on UUO-induced renal fibrosis.

Methods: Mice were divided into four groups; sham, UUO, and anti-F gene given to UUO group. The anti-F gene was administered 24 hours before and after the UUO. All mice were sacrificed seven days after UUO, and the renal tissue and blood were harvested. The kidneys were subjected to histological evaluation and the biochemical changes associated with renal injury.

Results: Anti-F-treated UUO kidney showed minimal histological changes, cell death, inflammation, and fibrosis compared to UUO kidneys. Of note, the expression of factors related to epithelial mesenchymal transition (EMT), one of the mechanisms of fibrosis, was significantly reduced in the Anti-F treatment group.

Conclusions: This is the first study that Anti-F gene ameliorates kidney fibrosis through EMT in a UUO mouse model. Our data show that Anti-F gene might be a therapeutic agent in the prevention and treatment of CKD.