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Omega 3 fatty acid ameliorates renal fibrosis in UUO mice via enhancement of autophagy flux.

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Objectives : It has been known that unilateral ureteral obstruction (UUO) induces autophagic activation in obstructed kidney. Inhibition of autophagy aggravates renal injury in UUO mice. Recently, it is reported that Omega 3 fatty acid regulate the autophagy. we evaluated whether ω3-PUFA may attenuate renal fibrosis in UUO mice, and evaluated associating mechanism.

Methods : 10-week-old male C57Bl/6 mice were divided into 4 groups; sham, Omega 3 + sham, vehicle (normal saline, same volume to Omega 3 + UUO, Omega 3 + UUO. Omega 3 and vehicle were administered orally using an NG tube (Omega 3 100mg/kg/day) from pre-operation day to 7 days after operation. Mice were sacrificed at 7 days after surgery and kidney tissue were collected. Real time RT-PCR, western blot and immunohistochemistry for molecular study and H&E stain and PAS stain for histologic examination were performed.

Results : Omega 3 treated UUO mice showed improvement of renal cell survival, renal function, and pathologic damage compared to vehicle treated UUO mice. Also omega-3 treatment reduced the renal expression of MCP-1, collagen IV, and TGF-ß in UUO kidney. UUO mice kidney showed that higher amounts of LC3, Beclin-1, Atg7 and p62 compared to sham mice. Omega 3 treated UUO kidney showed higher amounts of LC3, Beclin-1 and Atg7 and lower amounts of p62 compared to vehicle treated UUO kidney. Moreover, renal cathepsin D and ATP6E were also increased in Omega 3 treated UUO mice compared to vehicle treated UUO mice mice.

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Conclusions : Omega 3 fatty acid ameliorate renal fibrosis in UUO kidney via enhancement of autophagy flux.

Keywords : Unilateral ureteral obstruction, omega 3, autophagy