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일측 요로 폐쇄 흰쥐에서 자가탐식 현상이 요로폐쇄 신장과 반대측 신장에 대한 영향

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The Role of Autophagy in Obstructed and Contralateral Kidney in Unilateral Ureteral Obstruction Rat Model

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Background: Autophagy is a cellular process of degradation of damaged cytoplasmic components and regulates cell death or proliferation. We investigate the role of autophagy in the obstructed and contralateral kidney after UUO.

Methods: Sprague-Dawley rats underwent unilateral ureteral ligation with 4-0 silk suture through a midline abdominal incision. The efficacy of autophagy inhibitors, chloroquine and 3-methyladenine (MA), on UUO rat model was examined on the day 3, 7 and day 14.

Results: After UUO, autophagy was induced in the obstructed kidney with time dependent manner. Inhibition of autophagy by chloroquine and 3- MA enhance tubular cell apoptosis and tubulointerstitial fibrosis in the obstructed kidney after UUO. In the contralateral kidney, autophagy was also induced and prolonged during UUO. Inhibition of autophagy by chloroquine and 3-MA increase the protein expression of proliferating cell nuclear antigen significantly in the contralateral kidney after UUO. We also examined the regulatory mechanism of autophagy induction after UUO. Mammalian target of rapamycin (m-TOR) was decreased in both the obstructed and contralateral kidney after UUO. However, there were no significant differences of protein expression of AMP activated protein kinase (AMPK) between UUO and sham-operated rat both in the obstructed kidney and contralateral kidney.

Conclusion: Taken together, our present results support that autophagy induced by UUO has renoprotective role in the obstructed kidney and regulatory role of compensatory cellular proliferation in contralateral kidney through m-TOR signaling independent with AMPK mechanism.

Key Words: 자가탐식현상, 세포사멸, 섬유화
Autophagy, Apoptosis, Fibrosis