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일측 요로 폐쇄 흰쥐에서 자가 탐식 현상이 신세뇨관 섬유화에 미치는 영향

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The Role of Autophagy in Tubulointerstitial Fibrosis in Unilateral Ureteral Obstructive Rat

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Background : Autophagy is a regulated cellular process of degradation of damaged organelles and long-lived protein in cytoplasm. Depending on experimental condition, autophagy may contribute cell death or act as a cytoprotective mechanism. In this study, we investigated the role of autophagy in tubulointerstial fibrosis.

Methods : Sprague-Dawley rats underwent unilateral ureteral ligation with 4-0 silk suture through a midline abdominal incision. The rats were sacrificed at 1 day (n=6), 3 days (n=6), 7 days (n=6), 14 days (n=6), 21 days (n=6) after surgery. Sham operated rats were control group (n=6). Both kidneys were taken. We carry out trichrome stain for the degree of fibrosis, and LC3 western blot, LC3 immunohistochemical stain and electron microscopy for autophagy.

Results : Following unilateral ureteral obstruction (UUO), the conversion of LC3-I to LC3-II markedly increased at day 1 and day 3 and then gradually decreased toward basal levels. Immunohistochmical analysis with antibodies against LC3-II showed numerous positive stained cells dominantly in proximal tubule and similar time dependent manners with immunoblot assay. Electron microscopy showed markedly increase in autophagosome and autolysosome especially in proximal tubular cells and also similar time dependent manners with immunoblot assay.

Conclusion : This study has found that autophagy pathway is activated in dominantly proximal tubules in acute phase after UUO prior to tubular atrophy or tubular cell apoptosis. This may be a protective mechanism for tubular cell survival.

Key Words : 세포자멸사, 자가탐식현상, 일측요로폐쇄
Apoptosis, Autophagy, Unilateral ureteral obstruction