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일측성 요관폐쇄로 유발된 신장의 섬유화에서 방사선 조사의 효과

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Irradiation Attenuates Renal Fibrosis Induced by Unilateral Ureteral Obstruction

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Unilateral ureteral obstruction (UUO) results in renal malfunction by renal fibrosis. Inflammatory responses play a critical role in the kidney fibrosis. We hypothesized that irradiation, which has been used for the reduction of inflammatory responses, attenuates renal fibrosis induced by UUO. Male mice were subjected to either UUO or sham operation. Some mice were irradiated single dose of 8 gray using a cesium-137 source irradiator 1 day after UUO. Kidneys of mice were harvested on day 0 (without operation), day 3 and day 6 of UUO. UUO resulted in the dilatation of tubules, expansion of interstitium, increase of collagen deposition, and α-smooth muscle actin (alpha-SMA) expression in the obstructed kidneys. UUO caused the significant increases of F4/80 (a marker protein of monocyte /macrophage)-positive cells and myeloperoxidase (MPO) expression in the obstructed kidneys, indicating the increases of inflammatory responses. Irradiation significantly reduced the infiltration of F4/80-positive cells, MPO expression, alpha-SMA expression and collagen deposition after UUO. When RAW 264.7 monocytes/macrophages were injected into the irradiated mice via intravenous injection, the anti-fibrotic effect of irradiation was significantly reversed. In conclusion, irradiation attenuates renal fibrosis induced by UUO through reduction of monocytes/macrophages accumulation. Application of irradiation may exert a beneficial effect for renal fibrosis.

Key Words : 방사선 조사, 신장의 섬유화, 대식세포
Irradiation, Renal fibrosis, Macrophage