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## **The effects of dietary fat and protein on the repair of ischemic acute kidney injury**

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**Objectives:** The effects of diet on the intrarenal immunologic microenvironment and subsequent repair after ischemic acute kidney injury (AKI) are unclear. The effects of dietary fat and protein on intrarenal immunologic microenvironment and the repair of tubular damage after ischemic AKI were investigated using murine ischemic AKI and human kidney-2 (HK-2) cell hypoxia models.

**Methods:** From day 3 after bilateral or unilateral ischemia-reperfusion injury (BIRI or URIR) operation, control diet, high-fat with high-protein (HF+HP) diet, and low-fat with low protein (LF+LP) diet were provided to each cohort of 9-week-old male C57BL/6 mice. HK-2 cells were treated with additional lipid or amino acid after hypoxic insult.

**Results:** Compared to the control diet group, body weight was greater in the HF+HP group and smaller in the LF+LP group. There was no difference in plasma creatinine between groups, while total cholesterol concentration was higher in the HF+HP group and BUN and blood pressure were lower in the LF+LP group. After BIRI, intrarenal RANTES was higher in the HF+HP group, and IFN- $\gamma$ , IL-4, IL-10, IL-6, TNF- $\alpha$  were higher and VEGF was lower in the LF+LP group than in the control group. After URIR, IFN- $\gamma$ , IL4, and IL-6 were lower in the HF+HP group and IL-6 was higher in the LF+LP group than in the control group. The degree of fibrosis was comparable between groups after BIRI, but was more extensive in the LF+LP group compared to the control group after URIR. In HK-2 cells, addition of amino acid suppressed, but addition of lipid promoted proliferation after hypoxic insult.

**Conclusions:** Our study suggests that excessive restriction of protein and fat during the healing phase may be harmful on the recovery of ischemic AKI. Further studies on the individual effects of protein and lipid on the recovery of ischemic AKI are needed.