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Transgenic mice with high endogenous omega-3 fatty acids are protected from ischemia-reperfusion-induced acute kidney injury

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Several studies have shown that omega-3 polyunsaturated fatty acids (PUFAs) diet can reduce kidney dysfunction following ischemic injury. *fat-1* transgenic mice produce abundant omega-3 PUFAs, resulting in balanced omega-6 : omega-3 ratio in comparison to wild type (WT) mice. Therefore, the purpose of this study was to determine whether omega-3 PUFAs are protective in AKI caused by ischemic injury using *fat-1* transgenic mice.

To induce AKI, mice were subjected to renal ischemia-reperfusion injury (IRI). Animals were sacrificed at 24 hr and 72 hr of post-reperfusion. After that, renal function and severity of renal injury were estimated.

BUN (blood urea nitrogen) and serum creatinine levels were decreased in *fat-1* group at 24 hr post-IRI, although the difference was not statistically significant. The levels were significantly decreased in *fat-1* group compared to WT group at 72 hr post-IRI. The difference in Kim-1 expression was not statistically significant due to intragroup variation, but the fold-increase in Kim-1 expression in *fat-1* group was less than that in WT group. Relatively more lesions were observed on *fat-1* group than on WT group at 24 hr post-IRI. However, at 72 hr post-IRI, more lesions were observed in WT than in the *fat-1* group. Neutrophil infiltration was reduced at 72 hr in the *fat-1* group as compared to the WT group.

This study demonstrates that omega-3 PUFAs exert a protective effect on ischemia-induced AKI. Long-term and high-dose omega-3 supplements may preserve renal function and facilitate renal recovery following AKI.

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