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Dietary supplementation with Bacillus Superoxide dismutase protects against contrast-induced acute kidney injury in mice

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Objectives : Oxidative stress is known as one of the main player in the pathophysiology of contrast-induced acute kidney injury (CI-AKI). Although superoxide dismutase (SOD) constitutes an important antioxidant defense system, oral delivery of SOD has been challenging due to its relative instability, limited bioavailability, and low absorption efficiency in the gastrointestinal (GI) tract. *Bacillus amyloliquefaciens* SOD (BA-SOD) is highly stable and potent, orally available SOD that has been shown to exert anti-oxidant, anti-inflammatory effect in various inflammatory disease models and we tested its effect in CI-AKI mouse model.

Methods : Five-week-old C57BL/6 male mice were used for this study. CI-AKI model was induced by administration of 10mg/kg of intravenous contrast injection in volume-depleted, unilateral nephrectomized mice. BA-SOD was given via oral gavage once a day, 48 hours before intravenous contrast injection. Serum blood urea nitrogen (BUN), creatinine, and kidney tissue NGAL were determined.

Results : BA-SOD did not have kidney toxicity in the vehicle group. CI-AKI mice showed significantly elevated BUN level and tissue expression of NGAL. Oral administration of BA-SOD led significantly lower BUN level as well as tubular cell injury.

Conclusions : This is a pilot study suggesting that oral administration of BA-SOD might serve as a potent antioxidant in the prevention and treatment of CI-AKI.