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Preventive effect of Alpha-lipoic acid against oxidative stress in rat renal ischemia reperfusion

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Abstract

Background: Renal ischemia/reperfusion (I/R) injury is a main motive of acute renal failure in both native kidneys and renal allografts. Reactive oxygen species (ROS) play a role in the pathogenesis of I/R injury in the kidney. We investigated the effect of alpha-lipoic acid (LA) on the oxidative stress status in rat kidney subjected to I/R injury.

Material method: thirty male Wistar rats were randomly divided into 3 equal groups: control, I/R and I/R+LA in 50mg/kg once daily intra-peritoneal (i.p) injection for 2 week, prior to I/R. The right and left pedicles clamped for 45 minutes (ischemia), followed by 24 hours of reperfusion. The levels of Malondialdehyde (MDA) and glutathione (GSH) in addition the activities of glutathione peroxidase (GPO), catalase (CAT) as oxidative stress markers in kidney were determined.

Result: I/R injury caused notable increments MDA level, be joined with significant decreases in GSH level, GPX and CAT activities in kidney. Pretreatment with LA significantly reduced the enhanced oxidative stress in the ischemic rat kidney. So, it could be concluded that LA pretreatment effectively improved the antioxidant/oxidant imbalance associated with renal I/R injury in rats.

Conclusion: The findings showed that two week pretreatment of rats with LA by i.p in dose of 50mg/kg can reduce oxidative stress as main cause of ischemic renal injuries.

Keywords: Renal ischemia-reperfusion-Alpha lipoic acid-oxidative stress