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Acta Medica Iranica
2009;47(4) : 353-360

Original Article

EFFECTS OF ISCHEMIA-REPERFUSION ON RAT RENAL TISSUE ANTIOXIDANT SYSTEMS AND LIPID PEROXIDATION

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Received: September 4, 2006
 Accept : March 3, 2007
 Available online: November 29, 2008

Abstract:

Renal ischemia-reperfusion (IR) injury is a common problem in kidney transplantation. There is increasing evidence about the role of the reactive oxygen species (ROS) in these injuries and endogenous antioxidants seem to have an important role in decreasing the renal tissue injury. The aim of this study was to investigate the effects of kidney IR on renal antioxidant enzymes activity such as catalase and superoxide dismutase (SOD) and renal glutathione (GSH) levels. The level of malondialdehyde (MDA), an end product of lipid peroxidation, also was quantified. Male Wister rats (200-280 g) were anesthetized and after right nephrectomy, the left renal artery was clamped for 40 min. After 24 h reperfusion, serum and kidney tissue samples were obtained for metabolites assay. Results showed that renal IR increased serum creatinine and urea level [90.59 ± 12.93 vs. 44.06 ± 4.07 $\mu\text{mol/L}$ ($P < 0.01$), and 40.22 ± 10.27 vs. 20.8 ± 1.8 mmol/L , ($P < 0.05$), respectively]. The renal catalase activity was decreased (33.13 ± 2.02 vs. 43.78 ± 2.38 units/mg protein, $P < 0.01$) but SOD activity was increased (57.59 ± 4.64 vs. 42.84 ± 1.85 units/mg protein, $P < 0.05$). The GSH level also was decreased (24.67 ± 2.31 vs. 37.44 ± 3.09 nmol/mg protein $P < 0.01$). MDA level after IR was not significantly different from control group (2.05 ± 0.27 vs. 1.84 ± 0.2 nmol/mg protein, $P = 0.55$). Our data indicated that despite decrease in renal GSH level and catalase activity following IR, SOD activity was increased

TUMS ID: 12179

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