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Resveratrol as antioxidant and protective action on Renal Ischemia/Renal Injury via inhibiting action on TLR4/NF-κB p65 Signal Pathway.

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Objectives:

In rats, the effects of resveratrol (Resv) on its protective effect on renal ischemia (I)-renal injury (RI) has been investigated.

Methods:

Rats were randomized to the following: (I) group control (n=6); (II) group RI (n=6); (III) group RI+Resv (25mg/kg) group (n=6); (IV) group RI+Resv (50 mg/kg) group (n=6); group RI+Resv (100 mg/kg) group (n=6). Rats with a resveratrol (25, 50 and 100 mg/ kg body weight) were orally administered to the IRI+Resv classes once every day 15 days before activation of ischemia, accompanied by renal ischemia. For the control group and RI group, rats with equal volume of saline were administered by mouth once daily 15 days before ischemia was induced and renal IRI was followed.

Results:

Results showed that the pretreatment of resveratrol significantly reduced ROS and MDA levels.

On the other hand, the endogenous antioxidant activity of enzymes, including superoxide dismutase (SOD), catalase (CAT), glutathione reductase (GR) and glutathione peroxidase (GSH-Px) in ischemic rats showed regeneration, while urea-nitrogen and serum creatinine levels were decreased orally by resveratrol 15 days prior to ischemic reperfusion.

In addition, pre-treatment resveratrol has significantly reduced levels of TLR4 and NF-kB p65 protein expression in RIRI rats.

At the same period, the enhanced amount of IL-1β, IL-6, ICAM-1 and TNF-α serum, and improved RIRI rat development of IL-10 were attenuated by resveratrol pretreatment. In addition, pretreatment of resveratrol significantly diminished renal epithelial tubular cell apoptosis caused by renal ischemia/reperfusion, reducing renal ischemia/reperfusion injuries.

Conclusions:

These results indicate that the TLR4 / NF-kB p65 signal pathway can be suppressed and the resveratrol pretreatment can protect renal tubular epithelial cells against the ischemia/reperfusion-induced apoptosis that means antioxidants can be a potential and efficient agent to prevent injury to ischemia/ reperfusions by suppressing the extrinsic apoptotic signal pathway.