The effect of saponin on renal ischemia-reperfusion injury in male rats

Abstract

Background: Oxidative stress induced by renal ischemia reperfusion (IR) is considered to be an important factor involved in the pathophysiological renal alterations observed during IR injury. Renal IR injury is an important cause of kidney dysfunction. It contributes to the development of acute tubular necrosis (ATN) and renal failure.

Aim: This study was designed to assess the effects of saponin (SP) in kidney IR injury.

Material and Methods: Wistar male rats were randomly divided into four groups (N= 6) including the control, IR, SP, SP + IR. The rats were unilaterally nephrectomized and subjected to 45 min ischemia followed by 24 h reperfusion. SP (2.5 mg/kg) was intra-peritoneally injected prior to ischemia. After treatment, blood sample were collected for the measurement of biochemical parameters and the left kidney were removed for the determination of oxidative stress markers and histological changes.

Results: Renal IR significantly increased blood urea nitrogen (BUN), creatinine (Cr), malondialdehyde (MDA) levels and histopathological changes and significantly decreased antioxidant enzymes. While the administration of saponin significantly decreased BUN-Cr, MDA and improved antioxidant defense system.

Conclusion: The results of this study indicated that saponin caused the elevation of total antioxidant capacity (TAC) and reduction of lipid peroxidation. As a result, this drug decreased renal IR – induced oxidative stress and exerted nephroprotective effects against oxidative damage caused by IR.

Keywords: Ischemia reperfusion, Kidney, Oxidative stress, Saponin