

Effect of Green Coffee Bean Extract on Gentamicin Induced Acute Renal Failure in Rats

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Abstract : Introduction: Acute Renal Failure (ARF) is one of the most common problems encountered in hospitalized critically ill patients. In recent years great effort has been focused on the introduction of herbal medicine as a novel therapeutic agent for prevention of ARF. Hence, the current study was designed to investigate the effect of Green Coffee Bean Extract (GCBE) on gentamicin induced ARF in rats. Methods: The study was conducted on 60 male rats divided into six equal groups. Group 1 served as normal control group and GCBE was administered for 7 days at a dose of 20 mg/kg/day in group 2 and 40 mg/kg/day in group 3 to test the effect of GCBE on normal kidneys. ARF was induced by a daily intraperitoneal injection of gentamicin (80 mg/kg) for 7 days in group 4 (model group), group 5 (GCBE 20 mg/kg/day) and group 6 (GCBE 40 mg/kg/day). All rats were sacrificed after 7 days and blood was withdrawn for kidney function tests. Kidneys were removed for determination of renal oxidative stress markers and histopathological examination. Results: The present study showed that rats that received oral GCBE for 7 days without induction of ARF showed no significant change in all the assessed parameters in comparison to the normal control group, while rats in the groups that received oral GCBE for 7 days with induction of ARF showed a significant improvement in kidney functions tests (decrease in serum urea, serum creatinine, and blood urea nitrogen) when compared to the ARF model group. Moreover, there was significant amelioration in renal oxidative stress markers (renal malondialdehyde, renal superoxide dismutase) and renal histopathological changes in the GCBE treated groups along induction of ARF when compared to ARF model group. The most significant improvement was reported in the group where GCBE was administered for 7 days in a dose 40 mg/kg/day, along with induction of ARF. Conclusion: GCBE has a potential role in ameliorating renal damage involved in ARF mostly through its antioxidant effect.

Keywords : green coffee bean extract, gentamicin, acute renal failure, pharmacology

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