

Protective effect of hydroalcoholic extract of Vaccinium arctostaphylos on cisplatin induced acute kidney damage

Abstract

Background: Acute renal failure is one of the most serious clinical disorders that has severe consequences for patients and is associated with high mortality and is one of the medical treatment priorities. The aim of this study was to evaluate the protective effect of hydroalcoholic extract of *Vaccinium arctostaphylos* on cisplatin induced kidney damage at the molecular and pathological level.

Aim: Protective effect of hydroalcoholic extract of *Vaccinium arctostaphylos* on cisplatin induced kidney damage

Materials and Methods: In this study, 40 male Wistar rats were used. Rats were divided into five groups of eight, including negative control (receiving physiological serum), positive control (receiving physiological serum and single dose of cisplatin (7.5 mg/kg), receiving 100 mg/kg of extract and single dose of cisplatin, receiving 200 mg/kg extract for 14 days and single dose of cisplatin, receiving 400 mg/kg extract and single dose of cisplatin. After 14 days, serum and kidney tissue were isolated. Kidneys were examined using H&E and PAS staining. Real-time PCR was used to evaluate the expression of the studied genes. KIM1 protein was measured by ELISA method. Standard optical method was used to measure serum levels of urea, creatinine, ALT, AST, albumin and total protein.

Results: The dose of 200 mg/kg of extract significantly reduced the serum levels of urea compared to the cisplatin group ($p < 0.05$). Serum ALT and AST levels in the studied groups were significantly increased compared to the control group ($p < 0.05$). Serum creatinine levels at doses of 200 and 400 mg/kg of extracts were significantly reduced compared to cisplatin group ($p < 0.01$). The expression of p21 and CDK2 genes at a dose of 200 mg/kg of extract was higher than other groups ($p < 0.01$). The expression level of p53 gene in different doses of extract was higher than cisplatin group ($p < 0.001$). Pathological findings showed that tissue damage at 200 mg/kg extract was much less than other groups receiving cisplatin.

Conclusion: Our study showed for the first time that the hydroalcoholic extract of *Vaccinium arctostaphylos* reduced cisplatin induced kidney damage. Reduction in renal damage at a dose of 200 mg/kg of the extract is much higher than other groups treated with cisplatin and extract. Also, based on the findings of our study, a dose of 200 mg/kg of extract increased the expression of p21, p53 and CDK2 proteins compared to the control group.

Key words: Acute renal failure, p21, p53, CDK2, cisplatin