Evaluation The effect of hydroalcoholic extract of dandelion on the expression of p21, p27 and p53 genes in the model of acute renal injury in male Wistar rats

Abstract

Background: Acute renal failure is a sudden decrease in kidney function. The prevalence of acute renal failure is increasing worldwide and this disorder is one of the important treatment priorities. The p21, p27 and p53 genes have been shown to play an important role in cell cycle control and cell death.

Aim: The effect of dandelion extract on p21, p27 and p53 gene expression in acute renal injury in male Wistar rats

Materials and methods: Experimental groups included: 1- Negative control group: receiving physiological serum peritoneally 2- Positive control group: receiving physiological serum and receiving a single dose of 7.5 mg / kg cisplatin 3- Group receiving dandelion extract at a dose of 250 mg / kg and receiving a single dose of 7.5 mg / kg cisplatin 4- The group receiving dandelion extract at a dose of 500 mg / kg and receiving a single dose of 7.5 mg / kg cisplatin on the eighth day. After 10-12 hours of fasting, serum and kidney were isolated. Serum urea and creatinine levels were measured by photometry and standard kits. Kidney tissue hemolysis was used to extract total RNA and then cDNA synthesis. Expression of p21, p27 and p53 genes was evaluated using real-time PCR.

Results: The results of our study based on one-way ANOVA showed that serum levels of urea and creatinine in cisplatin groups, dandelion extract with different doses increased significantly compared to the control group ($p < 0.001$). Also, serum levels of urea and creatinine in the group receiving dandelion extract 250 mg / kg compared to the cisplatin group showed a significant decrease ($p < 0.05$). The expression of p21 gene in cisplatin group was significantly increased compared to the control group ($p < 0.001$). The expression of p21 gene in dandelion extract groups with different doses was significantly reduced compared to cisplatin group ($p < 0.01$). The expression of p27 gene was significantly

increased in cisplatin group and 250 mg / kg extract group compared to the control group ($p < 0.01$). The expression of p27 gene in dandelion extract group was 500 mg / kg much lower than other groups ($p < 0.001$). The expression of p53 gene was significantly increased in cisplatin group compared to control group ($p < 0.01$). The expression of p53 gene in dandelion extract groups was significantly reduced compared to cisplatin group ($p < 0.01$).

Conclusion: The results of our study showed that dandelion extract is very effective in preventing the severity of acute kidney damage and its protective effects appear to be through changes in the expression of genes effective in apoptosis and cell death including p21, p27 and p53.

Keywords: Acute kidney injury, p21, p27, p53, dandelion