

Protective effects of crocin against cisplatin-induced acute renal failure and oxidative stress in rats

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Abstract

Background. The major side effect of cisplatin, used in some tumours, is nephrotoxicity. Reactive oxygen species and oxidative damage are the most important factors in cisplatin-induced acute renal failure. The main purpose of this study is to investigate the protective effects of crocin against cisplatin-induced acute renal failure and oxidative stress in rat. **Methods.** In this study, animals were randomly divided into 4 groups (1 each). Group one received normal saline (1 ml/day, i.p.). Group two received a single dose of cisplatin (5 mg/kg, i.p.). Groups 3 to 4 received crocin (100, 200 and 400 mg/kg, i.p.), respectively, for 3 consecutive days one hour before a single dose of cisplatin (5 mg/kg) only at the first day. Blood samples were taken out (on the fifth day) for measuring the level of urea and creatinine. The kidneys were removed for histopathological and biochemical examinations. Furthermore, 24-hour urinary factors were measured. **Results.** Blood urea, creatinine and urinary glucose and protein concentrations in crocin-treated groups were significantly lower than those of cisplatin-treated group in a dose-dependent manner. Histopathological studies showed a massive damage in S1 segment of proximal tubules in cisplatin-treated group. No damage was observed in crocin-treated groups. Crocin treatment resulted in a significant and dose-dependent reduction in malondialdehyde concentration as compared to the cisplatin-treated group. Moreover, crocin produced a significant elevation in total thiol and glutathione peroxidase concentrations, as compared with cisplatin-treated group. **Conclusion.** The results of the present study suggest that crocin has a protective effect against cisplatin-induced acute renal failure and relative oxidative stress.

Author keywords

Acute renal failure; Cisplatin; Crocin; Oxidative stress; Renal protection

Indexed Keywords

EMTREE drug terms: cisplatin; creatinine; crocin; glutathione peroxidase; malonaldehyde; thiol; urea

EMTREE medical terms: acute kidney failure; animal experiment; animal model; animal tissue; article; concentration (parameters); controlled study; creatinine blood level; dose response; glucose urine level; histopathology; kidney injury; kidney proximal tubule; male; nonhuman; oxidative stress; rat; renal protection; urea blood level

MeSH: Adjuvants, Pharmaceutic; Animals; Antineoplastic Agents; Carotenoids; Cisplatin; Glycosuria; Kidney Failure, Acute; Male; Oxidative Stress; Proteinuria; Random Allocation; Rats; Rats, Wistar
Medline is the source for the MeSH terms of this document.

Species Index: Animalia; Rattus

Chemicals and CAS Registry Numbers: cisplatin, 10673-27-1, 26.30-31-2, 97.81-74-2; creatinine, 19230-81-0, 70-27-0; crocin, 29470-00-4, 42002-70-1; glutathione peroxidase, 9.13-77-0; malonaldehyde, 042-78-9; urea, 07-13-7; Adjuvants, Pharmaceutic; Antineoplastic Agents; Carotenoids, 37-88-4; Cisplatin, 10673-27-1; crocin, 42002-70-1
Manufacturers:Drug manufacturer: Fluka, Japan.