Iranian Journal of Medical Sciences

Volume 32, Issue 3, September 2007, Pages 173-176

# Protective effect of safranal against hexachlorobutadiene-induced nephrotoxicity in rat

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## Abstract

Background: Hexachlorobutadiene (HCBD) is a potent nephrotoxin in rodents, which can cause degeneration, necrosis and regeneration in renal tubular epithelial cells. It has been shown that safranal, the active ingredient of saffron, has a protective effect against ischemic injuries. The aim of this study was to examine the protective effect of safranal against HCBD-induced nephrotoxicity in rats. Method: Thirty Wistar albino rats were randomly divided in five groups. The rats received a single dose of corn oil 1ml/kg (group1), HCBD 50mg/kg (group 2), or safranal at doses of 0.5, 0.25 and 0.1 ml/kg one hour before HCBD (50mg/kg) injection (groups 3-5). All injections were carried out intraperitoneally. Urine samples were collected one day before, and one day after injections. On day 3 the animals were sacrificed and both kidneys were removed. The right kidney was fixed in formalin for histological examination and the left kidney was homogenized for measuring malondialdehyde (MDA). Blood samples were taken by cardiac puncture and used for the measurement of urea, creatinine, glucose and protein concentrations. Results: Blood urea concentration in HCBD treated group was significantly higher compared with group 3 ($p<0.01$) and groups 1 and 4 ($p<0.001$). There was no significant difference in urea concentrations between group 5 and HCBD treated group. Urinary concentration of glucose was significantly higher in group 2, compared with groups 1, 3 and 4 ($p<0.001$) No significant differences were observed in urinary glucose concentrations between HCBD- and safranal (0.1ml/kg)-treated groups. Concentration of protein was also significantly higher in group 5 than those of other tested groups ($p<0.001$). Conclusion: Safranal at doses of 0.25 and 0.5ml/kg has a protective effect against HCBD-induced nephrotoxicity in rats.

## Reaxys Database Information

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## Author keywords

Hexachlorobutadiene; Malondialdehyde; Nephrotoxicity; Safranal

## Indexed Keywords

EMTREE drug terms: corn oil; creatinine; formaldehyde; glucose; hexachlorobutadiene; malonaldehyde; plant extract; protein; safranal; unclassified drug; urea

EMTREE medical terms: animal experiment; animal model; animal tissue; article; blood sampling; comparative study; controlled study; creatinine blood level; drug effect; female; glucose blood level; glucose urine level; heart; histology; injection; kidney; male; nephrotoxicity; nonhuman; protein blood level; puncture; rat; renal protection; statistical significance; urea blood level; urinalysis; Wistar rat

Chemicals and CAS Registry Numbers: corn oil, 8001-30-7; creatinine, 19230-81-0, 60-27-5; formaldehyde, 50-00-0; glucose, 50-99-7, 84778-64-3; hexachlorobutadiene, 87-68-3; malonaldehyde, 542-78-9; protein, 67254-75-5; urea, 57-13-6
Manufacturers:Drug manufacturer: Fluka, Switzerland.

ISSN: 02530716 CODEN: IJMSD Source Type: Journal Original language: English
Document Type: Article