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Title:

Physiological Biochemical and Reproductive Study of New Compound of a L-arginine derivative on Laboratory Rats Treated with Cadmium Chloride

Abstract:

The present study was conducted in the Veterinary Medicine College /university of Basrah to synthesize a new compound [N-(4-N-Hydroxy-3- methoxy-1-benzylidene) arginine], yielded a novel Schiff base derivative of a of L-arginine which is symbolized as AVO, to evaluate its antioxidant potential activity and ability to improve the fertility percentage. The new compound synthesized in the biochemical laboratory, is characterized by IR, elemental analysis (CHN), 1H, 13C, HMBC, HSQC, and RSESYNMR spectroscopy.

The first experiment (LD50): determine the LD50 by Dixon up and down, was found 718.6 mg/kg of B.W

♦The second experiment (antioxidant iv vitro study of new compound): study the antioxidant activity of the synthesized compound in vitro after treating hemolysate by CdCl2. The results showed that the AVO prevented oxidation of hemoglobin and conversion to MeTH at concentration 5µm.

♦The third experiment (antioxidant iv vivo study of new compound): 32 mature male rats are used to evaluate the protective effect of the novel compound in contrast with (CdCl2) toxicity on rats, divided into four groups (8 in each group) as following: The first group: are injected IP with

0.5ml of normal saline (control group). The second group: are injected IP with 1/10 of LD50 of AVO its mean 72 mg/kg B.W. The third group: are injected IP with 225mg / kg. B.W of CdCl2. The Fourth group: are injected IP with 225 mg/kg. B.W CdCl2, then after one hour they were injected IP with 72mg / kg of AVO.

The experiment lasted for 28 days. Cadmium chloride treated rats exhibit a significant increase in WBC, liver enzymes, Lipid profiles, also a significant reduction in RBCs, HB, FSH, LH, testosterone, sperm concentration, sperm motility % and live sperm. In addition to histological changes in liver, kidney, spleen and tests. Most the CdCl2 induced changes are ameliorated with AVO.

♦The fourth experiment (reproductive study of new compound):

In this part of the experiment, 24 mature rats are used (16 female and 8 male). The male rats were divided to four groups, the male rats treated as a third experiment (antioxidant iv vivo

study of new compound). The experiment lasted for 21 days, after that only one male mating was allowed to mate two females. The mating duration lasted for 10 days, when the females are separated in individual cages till the parturition .Once the females rats gave birth, the number of new births were calculated, and the sperm viability and fertility percentage were documented. The results showed a significant reduction ($P<0.05$) in the birth number, sperm viability and fertility percentage in the Cd treated group, while the AVO ameliorates the reduction in birth number sperm viability and fertility percentage that caused by administration of $CdCl_2$.