Alpha lipoic acid versus N-acetyl cysteine in protection against fenpyroximate induced toxicity in albino rats

Thesis

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By

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(key words: fenpyroximate, oxidative stress, lipid perioxidation , endocrine toxicity and natural antioxidant).

This thesis was designed to study and investigate the endocrine disrupture effect of fenpyroximate pesticide and the potentiality of each of alpha lipoic acid and N-acetylcysteine in attenuating the toxicity of fenpyroximate. 90 males of albino rats weighed(150gm) and (3 month age) will be divided into nine 9 main groups (10 rats in each) according to type and dose that rats intake. Group (1) served as control, Group (2) rats were orally treated with antioxidant alpha lipoic acid (ALA), Group (3) rats were orally treated with antioxidant N-acetyl cysteine (NAC),Group (4) rats were orally treated with high dose of pesticide, Group (5) rats were orally treated with (ALA) after administration of high dose of pesticide, Group (6) rats were orally treated with antioxidant (NAC) after administration of high dose of pesticide, Group(7) rats were orally treated with low dose of pesticide , Group (8) rats were orally treated with antioxidant (ALA) after administration of low dose of pesticide , Group (9) rats were orally treated with antioxidant (NAC) after administration of low dose of pesticide . All groups were force fed by gastric intubation for 14 and 28 days. The oxidative stress status of treated animals has been evaluated by assessment of total ATPase , total antioxidant activity, SH-Protein and malondialdehyde (MDA), the thyroid function markers (T3, and T4), pancreatic function markers (amylase, lipase, insulin and glucose), in addition cholesterol and protein were measured . Our result revealed that fenpyroximate induce inhibitory effect on total antioxidant activity, SH-Protein activity and increased in lipid perioxidation (MDA). The results showed also disturbances in thyroid and pancreatic markers. In addition , our result revealed that natural antioxidants (ALA and NAC) have more or less counteracting effect on oxidative stress , endocrine toxicity caused by fenpyroximate.

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Amr Reda Zaki

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LIST OF ABBREVIATION

ALA	Alpha Lipoic acid
ADI	Accepted daily intake
ATP	Adenosine triphosphate
DHLA	Dihydrolipoic acid
DA	Dopaminergic neurons
EPA	Environmental Protection Agency
EDC	Endocrine Disruptor Chemical
FMN	Flavin mononucleotide
2Fe-2s	Binuclear iron sulphur cluster
4Fe-4s	Tetanuclear iron sulphur cluster
GSH	Reduced glutathione
GSSG	Glutathione disulfide or oxidized glutathione
GSH-Px	Glutathione perioxidase
GSH	Glutathione
GST	Glutathione-S-transferase
GR	Glutathione reductase
GCL	Glutamate cysteine ligase
GSH/GSSG	Oxidised glutathione or glutathione disulphide
γ-GT	Gamma Glutamyl transferase
HPT	Hypothalamo pituitary thyroid

HP	High dose of pesticide
K	Potassium
LD50	Lethal dose in 50% of animals
LP	Low dose of pesticide
MDA	Malonidealdihyde
N2	Iron sulphur cluster
NO., ONOO	Nitrogen centered
NAC	N-acetyl-L-cysteine
NA	Sodium
NADH	Nicotineamide adenine dinucleotide
NADP	Nicotinamide Adenine Dinucleotide Phosphate
O2	Singlet oxygen
OH	Hdroperoxyl radicals
R., RCOO	Carbon-centered
ROS	Reactive oxygen species
SN	Substantia nigra
TSH	Thyroid stimulating hormone
T4	Tetraiodothyronine
T3	Triiodothyroinine.
TAC	Total Antioxidant Capacity
TCA	Trichloroacetic acid
TBA	Thiobarbituric acid

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