EFFECT OF ULTRAVIOLET RADIATION ON ENZYME ACTIVITIES OF EXPERIMENTAL ANIMALS TREATED WITH ANTIOXIDANTS

By

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تأثير الأشعة فوق البنفسجية على النشاط الإنزيمي فى حيوانات التجارب المعاملة بمضادات الأكسدة

رسالة مقدمة من

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ABSTRACT

Mohamed Mohamed Abdel Hady Abdel Fattah Omer: Effect of Ultraviolet Radiation on Enzyme Activities of Experimental Animals Treated with Antioxidants. Unpublished M.Sc. Dissertation, Department of Biochemistry, Faculty of Agriculture, Ain Shams University, 2009.

The present study was designed to investigate the protective effect of vitamin E and/or selenium administration against UVA-induced oxidative stress through the estimation of various parameters *i.e*. blood reduced glutathione (GSH) , lipid peroxidation expressed as malondialdehyde (MDA), plasma thiols (R-SH), glutathione peroxidase (GSH-Px), superoxide dismutase (SOD), and catalase (CAT). Not only that, but also, the changes that may be occur in some blood parameters such as triacylglycerol, total cholesterol, HDL-C, LDL-C, total proteins and albumin as well as liver functions such as GPT and GOT were taken as a criteria for evaluating the altered tissue function induced by exposure to UV radiation. For this purpose, rats were divided into eight groups, receiving vitamin E and/or selenium (Se) with or without ultraviolet irradiation. The UV groups every day were irradiated for 4 h with UVA light for 80 days. Groups of rats treated with vitamin E (as α-tocopheryl acetate) and selenium (as sodium selenite) were injected intraperitoneally before exposure to UV rays. Blood was taken after 20, 40, 60 and 80 days post-treatment. Results and data showed a significant decline was observed in all the mean values of GSH level, plasma thiols, HDL-C and albumin besides, the mean activity values of erythrocytes superoxide dismutase, blood catalase and glutathione peroxidase in groups of ultraviolet-irradiated rats compared with the control (non-irradiated)

rats group. In addition, the mean values of GOT and GPT, as well as plasma MDA, total cholesterol, LDL-C and triglycerides were significantly elevated in ultraviolet-irradiated rats compared with the corresponding values of the normal control rat group. The study suggested that, pretreatment with antioxidants was found to be effective as protective agents from radiation-induced alterations in all the tested parameters. On other words pretreatments with antioxidant maybe have some beneficial effects against UV-induced injury.

Key words:

Vitamin E, selenium, UVA, lipid peroxidation, reduced glutathione, glutathione peroxidase, superoxide dismutase, catalase, rats, blood and plasma parameters.

CONTENTS

LIST OF ABBREVIATIONS AND ACRONYMS

%	Per cent
$^1O_2$	Singlet oxygen
$^3O_2$	Triplet oxygen
^3S	Triplet sensitizer
8-OHdG	8-hydroxydeoxyguanosine
a.m.	ante meridiem, before noon
ALT	Alanine aminotransferase
ANOVA	Analysis of variance
AST	Aspartate aminotransferase
ATP	Adenosine Triphosphate
C	Control
CAT	Catalase
Co.	Company
COX	Cyclooxygenase
DNA	Deoxyribonucleic acid
DTNB	5,5-dithiobis- (2-nitrobenzoic acid)
e.g.	exampli gratia (Latin), for example
Ed	Edition
EDTA	Ethylenediaminetetraacetic acid
et al	et alii (Latin), and others
etc	et cetera (Latin), and so forth
ex vivo	(Latin), out of or from life
FAD	Flavin Adenine Dinucleotide
Fig.	Figure
g	Gram
G-6-P-D	Glucose-6-Phosphate Dehydrogenase
GOT	Glutamate Oxaloacetate Transaminase
GPT	Glutamate Pyruvate Transaminase
GR	GSH-reductase