A Study on the Possible Protective Effect of Ginkgo Biloba Extract Against LomefloxacinPhototoxicityin Mice

A thesis submitted in partial fulfillment of the requirement for the master degree in pharmaceutical sciences (pharmacology and toxicology)

By

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Abstract

Lomefloxacin is considered as the most phototoxic drug in quinolone antibiotics. Its phototoxic potential has been demonstrated in humanbeing as well as in laboratory animals. The aim of the present work was to evaluate the possible protective effect of ginkgo biloba extract (GBE), against lomefloxacin-induced phototoxicity. The study was performed on female balb/c mice. Lomefloxacin ٢٠٠ mg/kg was administered orally to induce phototoxicity. UVA radiation was directed to the animals' ears for ١٩٠ minutes at a dose of ٢١,٦ J/cm^{٢}. Immediately after radiation, animals were given a single oral dose of GBE where four dose levels were utilized (٢٥, ٥٠, ١٠٠ and ٢٠٠ mg/kg). Twenty four hours after irradiation, animals were examined for morphological parameters; i.e. ear erythema, ear pinna thickness and relative ear weight to body weight, and for biochemical parameters; i.e. ear tissue level of malondialdehyde, glutathione and zinc. The utilized dose of lomefloxacin was associated with

significant phototoxic changes that were seen in all the investigated parameters. Morphologically, the utilized four dose levels of GBE showed variable, but dose-dependent, protective potentials against lomefloxacin phototoxic consequences. As regarding the biochemical changes, co-administration of each of the used four dose levels of GBE could result in a significant increase in the ear tissue level of glutathione, as compared to lomefloxacin / UV treatment. However, none of the four dose levels did cause parallel significant ear tissue level decrease in malondialdehyde or increase in zinc. The histopathological findings were reflecting those gross and biochemical ones. It is concluded that GBE could produce dose-related protection against experimentally induced phototoxicity by lomefloxacin.

Pre-requisite Post Graduate courses

Beside the work presented in this thesis, the candidate has attended the following courses:

General courses:

Courses of instrumental analysis, physical chemistry, computer skills and statistics.

Special courses:

١. Clinical pharmacology and therapeutics.
٢. Clinical toxicology.
٣. Molecular pharmacology.
٤. Selected topics in pharmacology and toxicology.
٥. Pharmacology.

She has successfully passed examination in these courses with general grade Excellent

Department of Pharmacology and Toxicology

Contents

List of abbreviations

ANOVA: Analysis of variance.

cm: Centimeter.

CMC: Caboxymethyl cellulose.

DNA: Deoxyribonucleic acid.

e^-: Electron.

Fig.: Figure.

FQ: Fluroquinolone.

g.: Gram.

GBE: Ginkgo Biloba Extract.

GSH: Glutathione reduced.

H^+: Proton.

H_2O_2: Hydrogen peroxide.

IR: Infra-Red radiation.

Kg: Kilogram.

Lom: Lomefloxacin.

MDA: Malondialdehyde.

Min.: Minute.

mj: Milli Joule.

ml: Milliliter.

mm.: Millimeter.

mM: Milli mole.

mW: Milli Watt.

r.p.m.: Rotation per minute.

ROS: Reactive Oxygen Species.

s: Second.

SEM: Standard error of the mean.

SOD: Superoxide dismutase.

TBA: Thiobarbituric acid.

TBARS: Thiobarbituric acid reactive species.

UVA: Ultra-violet A radiation.

UVR: Ultra-violet radiation.

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Fig. (٧): Ear section of balb/c mice administered the vehicle and exposed to UV radiation showing the normal histological structure of the skin from both surfaces (S) and cartilage (C) with fat (F) in central zone, (H&E stain, X٦٤).

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