شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

HOSSAM MAGHRABY

شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

HOSSAM MAGHRABY

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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Evaluation the Therapeutic Role of L-carnitine Alone or Associated with some Antioxidants on Myocardial Dysfunction in Septic Rats

Submitted in Partial Fulfillment for the Requirements for the Degree of Ph. D of Science in Zoology

By

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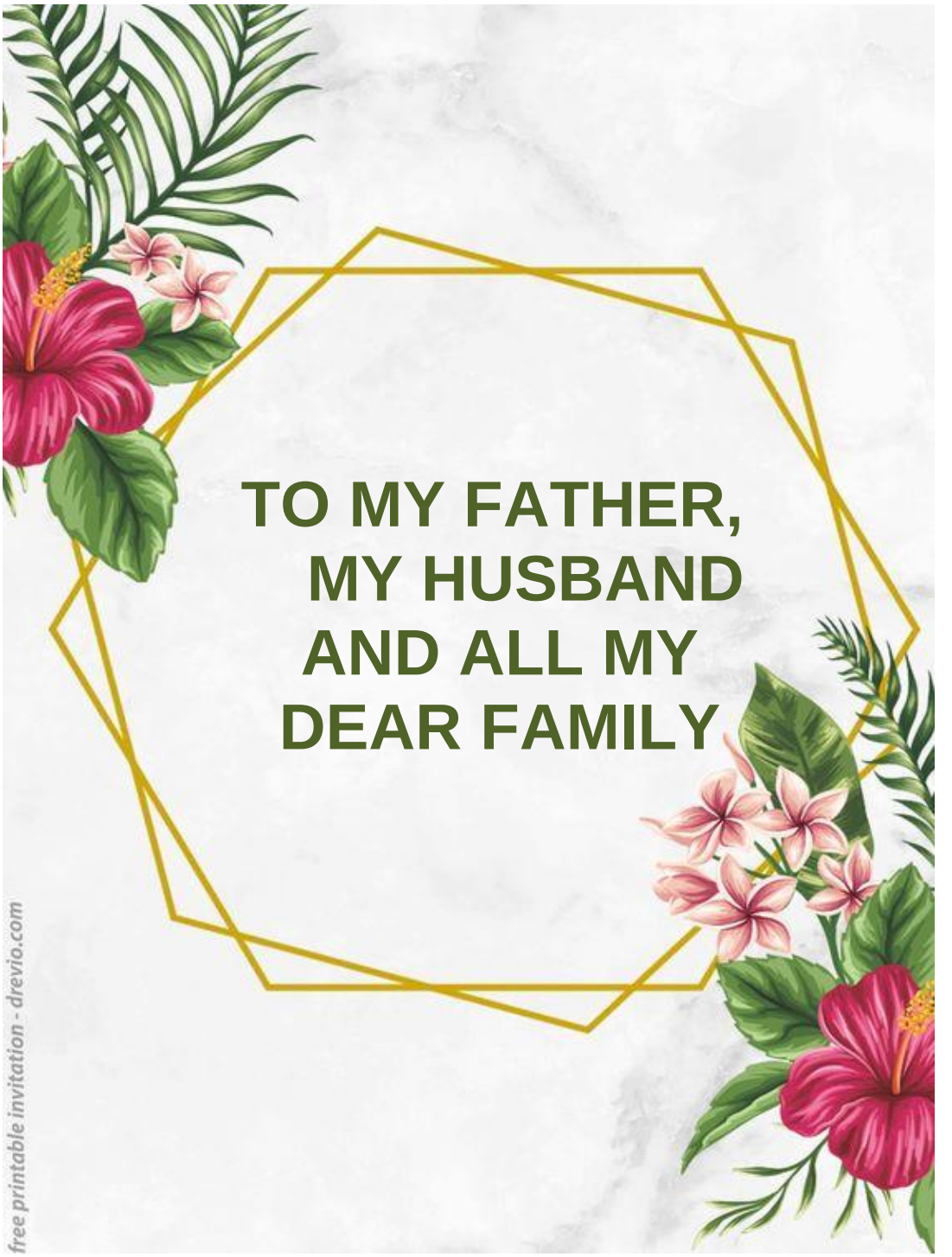
بسم الله الرحمن الرحيم
وعلمك ما لم تكن تعلم
وكان فضل الله عليك عظيما
سورة النساء (١١٣)


TO MY FATHER,
MY HUSBAND
AND ALL MY
DEAR FAMILY
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ABSTRACT

Abstract

The objective of this study was to evaluate the ability of L-carnitine (LC) alone or associated with coenzyme Q10 or/and α-lipoic acid to improve myocardial dysfunction in septic rats. Sepsis was induced by administering Lipopolysaccharides (LPS) in a single dose of 5mg/kg body weight intraperitoneally (i.p) to the rats, which were being treated daily with L-carnitine alone or with coenzyme Q10 or α-lipoic acid as well as their mixture for two weeks after three days of LPS injection.

Sixty adult male albino rats were employed in this work.This study was included two experiments and carried out as the following: In the first experiment, the rats were randomly divided into two main groups. In the first rats group, 15 rats were injected intraperitoneally (i.p) with saline solution and served as normal control rats group. The second animals group (45 septic rats), these rats were injected intraperitoneally (i.p) with a single dose of LPS (5mg/kg body weight). After three days of LPS injection (induction of endotoxin), five rats from each previous group were taken to compare the alterations in the serum heart enzymes activity, biochemical markers, lipids profile and cytokines profile as well as the changes in oxidative and antioxidant status in the heart tissues due to experimentally induction of sepsis associated with cardiovascular disease (CVD) in rats. In the second experiment (50 rats), five comparisons were made between normal control animals group (10 rats) and four septic (LPS) subgroups of animals (40 rats); 10 rats in each one. The first septic rats subgroup was treated daily with 200mg L-carnitine/kg body weight by oro-gastric tube for 14 days (LPS+LC subgroup). The second septic rats subgroup was treated daily with both 200mg L-carnitine and 200mg coenzyme Q10/kg body weight by oro-gastric tube for the same previous period (LPS+LC+CoQ10 subgroup). The third septic rats subgroup was treated daily with both 200mg L-carnitine and 100mg α-lipoic acid/kg body weight by oro-gastric tube for the same manner (LPS+LC+ALA subgroup). Finally, the fourth septic rats subgroup was treated daily with a combination of L-carnitine, coenzyme Q10 and α-lipoic acid by oro-gastric tube for the same pattern period (LPS+LC+CoQ10+ALA subgroup). All animals in the previous subsets and normal control group were divided into two periods (7&14 days).

The obtained data revealed remarkable changes in serum heart enzymes profile (CK,CK-MB, LDH and AST), cardiac profile (H-FABP, myoglobin, endothelin-1, resistin and total nitric oxide), lipids profile (total cholesterol, triglycerides, high density lipoprotein-cholesterol and low density lipoprotein-cholesterol) and cytokines profile (tumour necrosis factor-α, interleukin-1β and interleukin-6) in septic rats than those in normal control ones. Also, considerable alterations were obtained in the oxidative and antioxidant status (hydrogen peroxide, malondialdehyde, reduced glutathione, oxidized glutathione, GSH/GSSG ratio, glutathione peroxidase, superoxide dismutase and catalase) in homogenate heart tissues of septic rats than those in normal control ones.

When septic rats group was treated with L-carnitine alone or with coenzyme Q10 or α-lipoic acid as well as their mixture for 7 or 14 days a considerable amelioration effects in all previous studied parameters were pronounced dependent on time of treatment and certain mechanisms which were discussed according to available recent researches.

Key words: Septic rats, Lipopolysaccharides, Myocardial dysfunction, L-carnitine, Coenzyme-Q10, α-lipoic acid.

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