



كلية البنات للآداب والعلوم والتربية

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للأكسدة على وظائف الكلية ومعايير الدم في مرضى ضغط الدم  
المرتفع والسكري

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تاريخ المنح:

٢٠١٢ / /

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كلية البنات للآداب والعلوم والتربية

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كلية البنات للآداب والعلوم والتربية

**التأثيرات الفسيولوجية لصيام رمضان والتدعيم بمضاد للأكسدة  
على  
وظائف الكلية ومعايير الدم في مرضى ضغط الدم المرتفع والسكري**

رسالة مقدمة للحصول على درجة  
دكتوراه الفلسفة في العلوم (علم الحيوان)

من

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Women's College for Arts,  
Science and Education  
Zoology Department

*Physiological Effects of Ramadan fasting  
and anti-oxidant supplement  
on kidney function and blood indices  
in hypertensive and diabetic patients*

For  
(Ph.D.) Degree in Zoology  
By

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# *DEDICATION*

*To my parents who spend the best they have to  
raise me up in the right way*

## *Acknowledgement*

*First, all praise, thanks, and gratitude are due to Allah Sobhanaho WA Taala; the giver of all knowledge; without his mercy and help, this work would have not been accomplished.*

*Then, I would like to express my most sincere gratitude to my supervisors; Professor Dr. **Rokaya Mohammad Ali Saeed**, Dr **Hassan El-Sayed El-Batea** and Dr **Salwa Tawfeek Ayoub**. Their meticulous and through supervision and kind help and support throughout the experimental work and during the writing up of this dissertation are very much appreciated.*

*Many thanks should go to the volunteers who participated in this study for their time and co-operation. Without their kind help and co-operation, this work would have not been possible.*

*I am also very grateful to Professor Dr; **Shadia Mohammad Kadary** the Head of the Department of Zoology Women's College for Arts, Science and Education, Ain Shams University. I could have never achieved this without her kind support and continuous encouragement.*

*Words are not enough to thank Dr **Reham Salah**, Benha University Teaching Hospital, for helping in getting the*

*volunteers and Dr Gamal Moawad for his support and kind help during the experimental work.*

*I also would like to thank my colleagues and all administrative staff at the Department of Zoology at the Women's College for Arts, Science and Education, Ain Shams University.*

*Finally yet importantly, I am very thankful and most grateful to my parents who spent the best they have to raise me in the proper way.*

*No words are sufficient to express my gratitude sincere thanks and indebtedness to my husband, Professor Dr Ahmad Al-Shafei for His deep facilities advices and encouragement and the great help during the preparation of this thesis.*

*Special thanks from the deepest part of my heart are also to my lovely and sweaty children; Khadija, Abdulla, and tasneem.*

## **Abstract**

Hypertension and diabetes mellitus are common chronic diseases with high prevalence worldwide and in Egypt in particular. They are important causes of end-stage renal disease (ESRD). There has been recently an increasingly growing evidence for increased oxidative stress in association with chronic kidney disease and ESRD.

There is a public belief that Ramadan fasting affects kidney function adversely in hypertension and diabetic patients. The main objectives of the present study were to study and characterize the effects of Ramadan fasting and supplementation of vitamin E on parameters of kidney function; namely plasma urea, uric acid, creatinine, creatinine clearance, electrolytes and albumin excretion ratio and indices of oxidative stress; namely blood glutathione and plasma malondialdehyde (MDA). Furthermore, the current study evaluated the physiological and biochemical effects of Ramadan fasting and vitamin E supplementation on body mass index (BMI), blood pressure (BP), haemoglobin concentration (Hb), Glycosylated hemoglobin (HbA<sub>1c</sub>), fasting blood glucose (FBG) and plasma lipids, in patients with hypertension, diabetes and both hypertension and diabetes as well as in normal control subjects.

The results of the present study confirmed that Ramadan fasting has favorable effects on kidney function and lowers oxidative stress in

the hypertensive, diabetic and the hypertensive-diabetic patients. Vitamin E seemed to have synergistic effects to Ramadan fasting on these effects, which were primarily attributable to fasting. The study also reported that Ramadan fasting lowers BP and BMI. Furthermore, our results also showed that Ramadan fasting improves Hb levels and plasma lipids profile and results in better glycemic control.

## **List of Abbreviations**

- BP                      Blood pressure
- SBP                    Systolic blood pressure
- DBP                    Diastolic blood pressure
- PP                      Pulse pressure
- BW                      Body Weight
- BMI                     Body Mass Index
- DM                      Diabetes mellitus
- IDDM                   Insulin-dependent diabetes mellitus
- NIDDM                  Non-insulin-dependent diabetes mellitus
- DKA                    Diabetic ketoacidosis
- RAAS                   Renin-angiotensin-aldosterone system
- AII                      Angiotensin II
- GFR                    Glomerular filtration rate
- ADH                    Anti-diuretic hormone
- ANP                    Atrial natriuretic peptide

|                     |                                            |
|---------------------|--------------------------------------------|
| • Na                | Sodium                                     |
| • K                 | Potassium                                  |
| • Ca                | Calcium                                    |
| • P                 | Phosphorous                                |
| • 1,25-DHCC         | 1,25-dihydroxycholecalciferol              |
| • CKD               | Chronic kidney disease                     |
| • ESRD              | End-stage renal disease                    |
| • Hb                | Haemoglobin                                |
| • HbA <sub>1c</sub> | Glycosylated haemoglobin                   |
| • FBG               | Fasting blood glucose                      |
| • TG                | Triglycerides                              |
| • TC                | Total cholesterol                          |
| • HDL               | High-density lipo-proteins cholesterol     |
| • LDL               | Low-density lipo-proteins cholesterol      |
| • VLDL              | Very low-density lipo-proteins cholesterol |
| • MDA               | Malondialdehyde                            |

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