



شبكة المعلومات الجامعية  
التوثيق الإلكتروني والميكروفيلم

# بسم الله الرحمن الرحيم



**MONA MAGHRABY**



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# شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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# جامعة عين شمس

## التوثيق الإلكتروني والميكروفيلم

### قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها  
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



### يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



**MONA MAGHRABY**



# **The Effect of Ketogenic Diet on Fungal Infection**

*Thesis*

*Submitted for Partial Fulfillment  
of Master Degree in **Pediatrics***

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

# قَالَ

سُبْحَانَكَ لَا عِلْمَ لَنَا  
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ  
الْعَلِيمُ الْعَظِيمُ

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# List of Abbreviations

Abb.	Full term
<i>A<sub>1</sub>R</i>	<i>A<sub>1</sub> receptors</i>
<i>AA</i>	<i>Arachidonic acid</i>
<i>AcAc</i>	<i>Acetyl-CoA and Aceto-acetate</i>
<i>AED</i>	<i>Antiepileptic drug</i>
<i>AEDC</i>	<i>Adult Epilepsy Diet Center</i>
<i>APC</i>	<i>Antigen presenting cells</i>
<i>BDH1</i>	<i>Bidirectional BHB dehydrogenase</i>
<i>BHB</i>	<i>Beta-hydroxy- Butarate</i>
<i>BMI</i>	<i>Body mass index</i>
<i>CBC</i>	<i>Complete blood count</i>
<i>CPT</i>	<i>Carnitine palmitoyltransferase</i>
<i>DHA</i>	<i>Docosahexanoic acid</i>
<i>DHR</i>	<i>Dihydrorhodamine</i>
<i>GLUT-1</i>	<i>Glucose transporter type 1</i>
<i>GSH</i>	<i>Reduced glutathione</i>
<i>HDL</i>	<i>High density lipoprotein</i>
<i>HMG-CoA</i>	<i>3-hydroxy-3-methylglutaryl CoA</i>
<i>HOCl</i>	<i>Hypochlorous acid</i>
<i>HS</i>	<i>Highly significant</i>
<i>Ht</i>	<i>Height</i>
<i>KD</i>	<i>Ketogenic Diet</i>
<i>KDs</i>	<i>Ketogenic diets</i>
<i>LCAD</i>	<i>Long-chain acyl dehydrogenase deficiency</i>
<i>LCT</i>	<i>Long chain triglycerides</i>
<i>LGIT</i>	<i>Low Glycemic Index Treatment</i>
<i>MAD</i>	<i>Modified Atkins Diet</i>
<i>MCAD</i>	<i>Medium-chain acyl dehydrogenase deficiency</i>
<i>MPO</i>	<i>Myeloperoxidase</i>
<i>NAD<sup>+</sup></i>	<i>Nicotinamide adenine dinucleotide</i>
<i>NBT</i>	<i>Nitroblue tetrazolium test</i>
<i>NE</i>	<i>Norepinephrine</i>
<i>NPY</i>	<i>Neuropeptide-Y</i>

# List of Abbreviations cont...

Abb.	Full term
<i>NS</i> .....	<i>Non significant</i>
<i>PDH</i> .....	<i>Pyruvate dehydrogenase</i>
<i>PDHC</i> .....	<i>Pyruvate dehydrogenase complex</i>
<i>PFK</i> .....	<i>Phospho- fructokinase.</i>
<i>PUFAs</i> .....	<i>Polyunsaturated fatty acids</i>
<i>ROS</i> .....	<i>Reactive oxygen species</i>
<i>S</i> .....	<i>Significant</i>
<i>SCAD</i> .....	<i>Short-chain acyl dehydrogenase deficiency</i>
<i>SD</i> .....	<i>Standard deviation</i>
<i>SPSS</i> .....	<i>Statistical package for Social Science</i>
<i>TCA</i> .....	<i>Tricarboxylic acid</i>
<i>UCPs</i> .....	<i>Uncoupling proteins</i>
<i>VNS</i> .....	<i>Vagus nerve stimulation</i>
<i>Wt</i> .....	<i>Weight</i>

## INTRODUCTION

**K**etogenic diet (KD) is a diet designed to treat patients with refractory epilepsy, regardless of the etiology. It depends on a very high fat content (90%) as well as a low carbohydrate (2%) and adequate protein (8%) content (*Allen et al., 2013*).

In addition, having low carbohydrate content in the diet causes reduction of blood glucose levels (*Westman et al., 2008*). This combination will force cells to rely on lipid oxidation and mitochondrial respiration rather than glycolysis for energy metabolism (*Allen et al., 2013*).

The exact antiepileptic mechanism of KD is unclear. However, it is suggested that the reduction of glucose consumption modulates the activities of neurotransmitters by increasing the inhibitory and/or decreased excitatory neurotransmitters like GABA and glutamate (*De Lima et al., 2014*).

Also, the modulation of biogenic monoamine levels was proposed as a plausible mechanism for explaining the anticonvulsant effects of the KD (*Martillotti et al., 2006*).

Neutrophils are important component of humans` innate phagocytic defense which usually arrive first at sites of infection and/or inflammation (*Klebanoff and Clark, 1978*).

They have a special role in defending the body against fungal infection. Within neutrophils, the heme protein myeloperoxidase mediates the production of hypochlorous acid, which is a potent microbicidal compound that is inhibited by acetoacetate. *Candida albicans*, survives in the presence of acetoacetate (*Saeed and Castle, 1998*).

From this we can conclude that acetoacetate inhibits neutrophil microbicidal activity and thus it might increase susceptibility to infections.



## **AIM OF THE STUDY**

**The main objectives of the study are:**

- 1- To estimate the phagocytic index and correlate it to the level of ketosis in the studied patients.
- 2- To assess the effect of ketosis induced by ketogenic diet on neutrophils as regards their number and function.