بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

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قسم

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MONA MAGHRABY

The Effect of Ketogenic Diet on Fungal Infection

Thesis

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

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Marwa Nasser Mohamed

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List of Abbreviations

Abb.	Full term
A_1R	*A_1 receptors*
AA	*Arachidonic acid*
AcAc	*Acetyl-CoA and Aceto-acetate*
AED	*Antiepileptic drug*
AEDC	*Adult Epilepsy Diet Center*
APC	*Antigen presenting cells*
BDH1	*Bidirectional BHB dehydrogenase*
BHB	*Beta-hydroxy- Butarate*
BMI	*Body mass index*
CBC	*Complete blood count*
CPT	*Carnitine palmitoyltransferase*
DHA	*Docosahexanoic acid*
DHR	*Dihydrorhodamine*
GLUT-1	*Glucose transporter type 1*
GSH	*Reduced glutathione*
HDL	*High density lipoprotein*
HMG-CoA	*3-hydroxy-3-methylglutaryl CoA*
HOCl	*Hypochlorous acid*
HS	*Highly significant*
Ht	*Height*
KD	*Ketogenic Diet*
KDs	*Ketogenic diets*
LCAD	*Long-chain acyl dehydrogenase deficiency*
LCT	*Long chain triglycerides*
LGIT	*Low Glycemic Index Treatment*
MAD	*Modified Atkins Diet*
MCAD	*Medium-chain acyl dehydrogenase deficiency*
MPO	*Myeloperoxidase*
NAD^+	*Nicotinamide adenine dinucleotide*
NBT	*Nitroblue tetrazolium test*
NE	*Norepinephrine*
NPY	*Neuropeptide-Y*

List of Abbreviations cont...

Abb.	Full term

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

INTRODUCTION

Ketogenic 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.