بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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MONA MAGHRABY

The Relationship between Serum Calprotectin and Peripheral Neuropathy in a Sample of Egyptian type 2 Diabetic Patients

Thesis

Submitted for Partial Fulfillment of M.Sc Degree in Endocrinology & Metabolism

By

Marwa Adel Afify

M.B.B.Ch – Faculty of Medicine- Misr University for Science and Technology

Under Supervision of

Prof. Dr. Salwa Seddik Hosny El Khawaga

Professor of Internal Medicine, Endocrinology& Metabolism
Faculty of medicine – Ain Shams University

Dr. Ahmed Mohamed Bahaa El Din

Assistant Professor of Internal Medicine, Endocrinology& Metabolism
Faculty of medicine – Ain Shams University

Dr. Nahla Nader Adly

Lecturer of Internal Medicine, Endocrinology & Metabolism
Faculty of medicine – Ain Shams University

Dr. Mohamed Ali Awadein

Lecturer of Internal Medicine
Faculty of medicine – Misr University for Science and Technology

Ain Shams University
Faculty of Medicine
2021


بسم الله الرحمن الرحيم
قَالوُاسُبحَانَك لاَعِلمَ لنَا إلا مَاعَلمتَناَ
إنكَ أَنتَ العَلِيمُ الحَكِيمُ
صدق الله العظيم
(سورة البقرة – الآية ٣٢)

Acknowledgment

First of all, thanks GOD, the merciful, the beneficent for helping me during this work.

I would like to express my indebtedness and deepest gratitude to **Prof. Dr. Salwa Seddik Hosny El Khawaga,** Professor of Internal Medicine, Endocrinology& Metabolism, Faculty of Medicine, *Ain Shams* University for her valuable advice, guidance and constructive criticism, also for the invaluable assistance and efforts she devoted in the supervision of this study.

I'll never forget, how co-operative was **Dr. Ahmed Mohamed Bahaa El Din**, Assistant Professor of Internal Medicine, Endocrinology& Metabolism, Faculty of Medicine, *Ain Shams* University, also he was encouraging all the time. It is honorable to be supervised by him.

I would like also, to express my great thanks to **Dr. Nahla Nader Adly**, Lecturer of Internal Medicine, Endocrinology & Metabolism, and Faculty of Medicine – *Ain Shams* University. Her valuable advises and continuous support facilitated completing this work.

I would like also, to express my great thanks to **Dr. Mohamed Ali Awadein**, Lecturer of Internal Medicine, Misr University for Science and Technology, and Faculty of Medicine. His valuable advises and continuous support facilitated completing this work.

I would like to thank all the staff members of the Internal Medicine department.

Finally, I would like to express my appreciation and gratitude to all my family, especially my caring and loving parents who enlighten my life.

Marwa Adel Afify

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List of Abbreviations

Abb.	Full term
ADA	*American Diabetes Association*
AGEs	*Advanced glycation end products*
C5a	*Complement component 5a*
CCM	*Corneal Confocal Microscopy*
CIDP	*Chronic inflammatory demyelinating polyneuropathy*
CVD	*Cardiovascular disease*
DM	*Diabetes mellitus (*
DN	*Diabetic neuropathy*
DPN	*Diabetic peripheral neuropathy*
DPNP	*Diabetic peripheral neuropathic pain*
DSP	*Distal symmetric polyneuropathy*
DSPN	*Diabetic sensori-motor polyneuropathy*
EDTA	*Ethylene- diamino tetra acetic acid*
eNOS	*Endothelial nitric oxide synthase*
Fmlp	*N-formylmethionyl- leucylphenylalanine*
FPG	*Fasting plasma glucose*
GAD65	*Glutamic acid decarboxylase*
GSH	*Glutathione*
GSSG	*Oxidized glutathione*
HDL	*High density lipoprotein*
hsCRP	*High sensitive c-reactive protein*
IA-2	*Islet antigen-2*
IENFD	*Intraepidermal nerve fiber density*
*IL-1*β	*Interleukin-1*β
IR	*Insulin resistance*

List of Abbreviations Cont...

Abb.	Full term
LDL	*Low density lipoprotein*
LPS	*Lipopolysaccharide*
MMPs	*Matrix metalloproteinases*
NAD	*Nicotinamide adenine dinucleotide*
NAD	*Nicotinamide adenine dinucleotide*
NADH	*Nicotinamide adenine dinucleotide hydrogen*
NADP	*Nicotinamide adenine dinucleotide phosphate*
NADPH	*Nicotinamide adenine dinucleotide phosphate*
NCS	*Nerve conduction studies*
NO	*Nitric oxide*
OGTT	*Oral glucose tolerance test*
PKC	*Protein kinase C*
ROS	*Reactive oxygen species*
SFN	*Small fiber neuropathy*
T2DM	*Type 2 diabetes*
TCA	*Trichloroacetic acid*
TLR4	*Toll like receptors 4*
TNFα	*Tumor necrosis factor-α*
US	*Ultrasound*
WHO	*World Health Organization*
ZnT8	*Zinc transporter 8*

ABSTRACT

Background; Plasma calprotectin is a persistent biomarker of insulin resistance (IR), gastroenteritis, and cardiovascular disease (CVD). Elevated plasma levels of calprotectin have been reported in a variety of chronic inflammatory conditions. Elevated calprotectin levels have been reported to predict microvascular alterations in type 2 diabetes (T2DM) patients**, Aim and objectives;** to evaluate if there is a relationship between serum calprotectin and perioheral neuropathy in a sample of Egyptian type 2 Diabetic patients, **Subjects and methods;** This study is a case–control study that was conducted on 60 subjects their age ranging from 45- 60 years old, recruited from Endocrinology & metabolism outpatient clinic at Ain Shams University hospitals, divided into 3 groups, during the period from May to October 2020, **Result;** there was highly statistically significant difference found between two groups regarding HS CRP, S calprotectin, AlT, AST, Urea and creat, HbA1c, FbG,2hrpp with (p-value 0.000), **Conclusion;** high levels of calprotectin detected in type 2 diabetic patients with peripheral neuropathy suggest that this molecule may have a role in pathogenesis of neuroinflammation among these patients. Serum calprotectin levels in the future may be used as potential markers of its presence, severity and progression of the diabetic peripheral neuropathy. Therapeutic strategies for blocking S100A9 and its activity are recently under development in inflammatory diseases. Therefore, Diabetic neuropathy is associated with increased serum level of calprotectin, **Keywords; Calprotectin, Diabetes mellitus, Neuroinflammation, Peripheral neuropathy.**

INTRODUCTION

Diabetes is a growing global health problem. According to data published by the International Diabetes Federation, there are 425 million diabetic patients (aged 20–79 years) worldwide; by 2045, this number is expected to rise to 693 million ***(Cho et al., 2018).***

The most commonly encountered microvascular complication of type 2 diabetes is Diabetic peripheral neuropathy (DPN) affects over 50% of diabetic patients and has emerged as a severe public health problem ***(Iqbal et al., 2018).*** This chronic complication causes immense financial burden and seriously decreases the life quality and expectancy of diabetic patients ***(Hicks and Selvin 2019).***

DPN is induced by multifactorial metabolic disorders, including abnormal metabolism of glucose, lipid, and protein leading to vascular abnormalities, neurotrophic factor insufficiency, oxidative stress and immune damage ***(Dewanjee et al., 2018).***

The duration of diabetes and glycemic control is the most significant risk factors for DPN. Other risk factors for cardiovascular disease are also associated with DPN, including: obesity, hypertension, smoking, and dyslipidemia ***(Callaghan et al., 2018)*** approximately 50% of people with DPN suffer from peripheral neuropathic pain ***(Alleman et al., 2015).*** Many