

# بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ





# شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



# جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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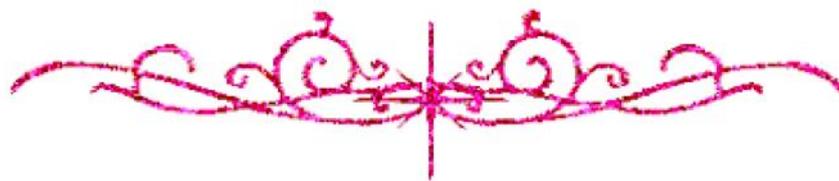


# بعض الوثائق الأصلية تالفة





# بالرسالة صفحات لم ترد بالأصل



# **Peripheral Nerve Dysfunction and its Correlation to Interleukin-6 Level in Obese Patients**

Thesis

*Submitted for partial fulfillment of master degree in  
Physical Medicine, Rheumatology and  
Rehabilitation*

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2020

# Acknowledgment

*First and foremost, I feel always indebted to **ALLAH**, the Most Kind and Most Merciful.*

*I'd like to express my respectful thanks and profound gratitude to **Prof. Mona Mahmoud Arafa**, Professor of Physical Medicine , Rheumatology and Rehabilitation, Faculty of Medicine- Ain Shams University for her keen guidance, kind supervision, valuable advice and continuous encouragement, which made possible the completion of this work.*

*I am also delighted to express my deepest gratitude and thanks to **Prof. Irene Raouf Amin**, Professor of Physical Medicine, Rheumatology and Rehabilitation, Faculty of Medicine, Ain Shams University, for her kind care, continuous supervision, valuable instructions, constant help and great assistance throughout this work.*

*I am deeply thankful to **Dr. Manal Samier Ahmad**, Lecturer of Physical Medicine, Rheumatology and Rehabilitation, Faculty of Medicine, Ain Shams University, for her great help, active participation and guidance.*

*I would like to express my hearty thanks to all my family for their support till this work was completed.*

*Last but not least my sincere thanks and appreciation to all patients participated in this study.*

*Mary Fayez Francis*

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# List of Abbreviations

Abb.	Full term
<i>ADP</i>	<i>Air displacement plethysmography</i>
<i>ATP</i>	<i>Adenosine triphosphate</i>
<i>BAT</i>	<i>Brown adipose tissue</i>
<i>BMI</i>	<i>Body mass index</i>
<i>BNB</i>	<i>Blood–nerve barrier</i>
<i>CAN</i>	<i>Cardiovascular autonomic neuropathy</i>
<i>CKD</i>	<i>Chronic kidney disease</i>
<i>CMAPs</i>	<i>Compound muscle action potentials</i>
<i>CNS</i>	<i>Central nervous system</i>
<i>CRP</i>	<i>C-reactive protein</i>
<i>CT</i>	<i>Computerised tomography</i>
<i>CTS</i>	<i>Carpal tunnel syndrome</i>
<i>CVD</i>	<i>Cardiovascular disease</i>
<i>CVs</i>	<i>Conduction velocities</i>
<i>DEXA</i>	<i>Dual-energy X-ray absorptiometry</i>
<i>DLs</i>	<i>Distal latencies</i>
<i>DPN</i>	<i>Diabetic peripheral neuropathy</i>
<i>DRG</i>	<i>Dorsal root ganglion</i>
<i>DSPN</i>	<i>Distal symmetric sensorimotor polyneuropathy</i>
<i>ER</i>	<i>Endoplasmic reticulum</i>
<i>FA</i>	<i>Fatty acids</i>

## *List of Abbreviations (cont...)*

<b>Abb.</b>	<b>Full term</b>
<i>HbA1c</i> .....	<i>Hemoglobin A1c</i>
<i>HC</i> .....	<i>Hip circumference</i>
<i>HDL</i> .....	<i>High density lipoprotein</i>
<i>HF</i> .....	<i>Height fat diet-fed</i>
<i>HIV</i> .....	<i>Human immunodeficiency virus</i>
<i>HPA - axis</i> .....	<i>Hypothalamic–pituitary–adrenal axis</i>
<i>IFG</i> .....	<i>Impaired fasting glucose</i>
<i>IFN</i> .....	<i>Interferons</i>
<i>IGT</i> .....	<i>Impaired glucose tolerance</i>
<i>IL-6</i> .....	<i>Interleukin 6</i>
<i>IL-6R</i> .....	<i>Interleukin 6 receptor</i>
<i>iNOS</i> .....	<i>Inhibiting enzyme of nitric oxide synthase</i>
<i>IR</i> .....	<i>Insulin resistance</i>
<i>JNK</i> .....	<i>Jun N-terminal kinase</i>
<i>LCFA</i> .....	<i>Long chain fatty acids</i>
<i>LLN</i> .....	<i>Lower limit of normal</i>
<i>LPL</i> .....	<i>Lipoprotein lipase</i>
<i>MAPK</i> .....	<i>Mitogen-activated protein kinase</i>
<i>MetS</i> .....	<i>Metabolic syndrome</i>
<i>MRI</i> .....	<i>Magnetic resonance imaging</i>
<i>NCS</i> .....	<i>Nerve conduction studies</i>
<i>NFD</i> .....	<i>Nerve fiber density</i>

## *List of Abbreviations (cont...)*

<b>Abb.</b>	<b>Full term</b>
<i>OA</i> .....	<i>Osteoarthritis</i>
<i>PCOS</i> .....	<i>Polycystic ovary syndrome</i>
<i>PKC</i> .....	<i>Protein kinase C</i>
<i>PNS</i> .....	<i>Peripheral nervous system</i>
<i>ROS</i> .....	<i>Reactive oxygen species</i>
<i>SFN</i> .....	<i>Small fiber neuropathy</i>
<i>sICAM-1</i> .....	<i>Soluble Intercellular Adhesion molecule-1</i>
<i>SNAPs</i> .....	<i>Sensory nerve action potentials</i>
<i>T2DM</i> .....	<i>Type 2 diabetes mellitus</i>
<i>TG</i> .....	<i>Triglyceride</i>
<i>TNF-<math>\alpha</math></i> .....	<i>Tumor necrosis factor-<math>\alpha</math></i>
<i>TSH</i> .....	<i>Thyroid-stimulating hormone</i>
<i>ULN</i> .....	<i>Upper limit of normal</i>
<i>WAT</i> .....	<i>White adipose tissue</i>
<i>WC</i> .....	<i>Waist circumference</i>
<i>WHR</i> .....	<i>Waist-to-hip ratio</i>
<i>WHtR</i> .....	<i>Waist-to-height ratio</i>

# INTRODUCTION

**O**besity has become an important public health problem. Obesity is a multi-causal chronic disease resulting from long-term positive energy balance with development of excess body fat (*Jastreboff et al., 2019*).

The World Health Organization (WHO) had set body mass index (BMI), calculated by dividing the body weight in kilograms (Kg) by the square of the height in meters (m), as a measure of total body fat where obesity is defined as BMI equal to or more than 30 kg/m<sup>2</sup> (*Segula, 2014*).

Obesity has different patterns of distribution. It could be visceral fat deposition (central obesity) referred to as “Apple shaped obesity” or subcutaneous fat deposition mainly around the hips and buttocks referred to as “Pear shaped obesity” based on the waist circumference and waist-to-hip ratio (WHR) (*Segula, 2014*).

Recently the prevalence of overweight and obesity has increased dramatically and so has interest in its associated complications. It is estimated that by 2025, 18% of men and 21% of women worldwide will be obese (*Kinlen et al., 2018*).

Complications of obesity include: cerebrovascular diseases, type 2 diabetes mellitus (T2DM), hypertension, asthma, depression, polycystic ovary syndrome, nonalcoholic fatty liver disease, gastrointestinal reflux disease, gallbladder disease and osteoarthritis (OA) (*Jastreboff et al., 2019*).