EVALUATION OF OXIDATIVE STRESS MARKERS AND LIPID PROFILE IN TYPE 2 DIABETES MELLITUS PATIENTS IN LAGOS- NIGERIA.

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(19PCP02021)

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A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTERS OF SCIENCE (M.Sc) DEGREE IN BIOCHEMISTRY IN THE DEPARTMENT OF BIOCHEMISTRY, COLLEGE OF SCIENCE AND TECHNOLOGY, COVENANT UNIVERSITY.

SEPTEMBER, 2021

ACCEPTANCE

This is to attest that this dissertation is accepted in partial fulfilment of the requirement for the award of the degree of Master of Science in Biochemistry in the Department of Biochemistry, College of Science and Technology, Covenant University, Ota, Ogun State, Nigeria.

Mr. John A. Philip **……**
(Secretary, School of Postgraduate Studies) **Signature and Date**

Prof. Akan B. Williams **……**
(Dean, School of Postgraduate Studies) **Signature and Date**

DECLARATION

I, OLUWALONI, FOLUSHO OMOTAYO (19PCP02021) declares that this research was carried out by me under the supervision of Dr. Omolara F. Yakubu of the Department of Biochemistry, Covenant University, Ota, Ogun State, Nigeria. I attest that the thesis has not been presented either wholly or partly for the award of any degree elsewhere. All the sources of data and scholarly information used in this dissertation are duly acknowledged.

OLUWALONI, FOLUSHO OMOTAYO **……...**

Signature and Date

CERTIFICATION

We certify that this dissertation titled **"EVALUATION OF OXIDATIVE STRESS MARKERS AND LIPID PROFILE IN TYPE 2 DIABETES MELLITUS PATIENTS IN LAGOS- NIGERIA"** is an original research work carried out by **OLUWALONI, FOLUSHO OMOTAYO (19PCPO2021)** in the Department of Biochemistry, College of Science and Technology, Covenant University, Ota, Ogun State, Nigeria, under the supervision of **Dr. Omolara F. Yakubu**. We have examined and found the work acceptable as part of the requirements for the award of a degree of Master of Science in Biochemistry.

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(Head of Department) **Signature and Date**

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(External Examiner) **Signature and Date**

Prof. Akan B. Williams **……**
(Dean, School of Postgraduate Studies) **Signature and Date**

DEDICATION

This research work is solely dedicated to God Almighty, the Alpha and Omega of all things for His endless love showered on me to execute this research, and also for the power to will and do of His good pleasure.

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LIST OF ABBREVIATIONS

IDF	International Diabetes Federation
WHO	World Health Organization
ADA	American Diabetes Association
DM	Diabetes mellitus
T1D	Type 1 Diabetes
T2D	Type 2 Diabetes
GDM	Gestational diabetes mellitus
DKA	Diabetic ketoacidosis
SOD	Superoxide dismutase
GSH	Reduced glutathione
GST	Glutathione -S- transferase
Trig	Triglycerides
TCHOL	Total Cholesterol
HDL	High density lipoproteins
IL-1Ra	Interleukin-1 receptor antagonist
EDTA	ethylene diamine tetra acetic acid
MDA	malondialdehyde
NO	nitrogen monoxide
ROS	reactive oxygen species
TBARS	thiobarbituric acid-reactive substances

ABSTRACT

Type 2 diabetes is an endocrine disease connected to some metabolic remodelings characterized by high blood glucose levels (hyperglycemia). However, the irregular occurrence of free radical generation, due to the oxidation of glucose, oxidative degradation of glycated proteins and protein nonenzymatic glycation; foster the advancement of type 2 diabetes. This study aims in comparing the correspondence between oxidative stress markers and lipid profiles of type 2 diabetes mellitus patients and non-diabetes persons. A total of 35 patients with type 2 diabetes and 36 persons as the control groups were examined by evaluating the plasma concentrations of some levels of biochemical parameters such as protein, total cholesterol (TC), triglycerides and high-density lipoprotein (HDL). The Plasma phospholipaseA2 (PA2) level was evaluated, as well as pro-oxidant indicators [malondialdehyde – MDA and nitric oxide (NO)] and oxidative status [superoxide dismutase (SOD), reduced glutathione level (GSH) and glutathione-S-transferase (GST)]; all analyzed using a standard spectrophotometric technique. The results indicated higher levels of MDA, GSH and GST in type 2 diabetic patients in contrast to non-diabetic control, however, MDA level of activity was significant. There was depletion in the levels of SOD and NO, with a significant decrease in NO. The study also observed a significant decrease in the concentrations of Total cholesterol, triglycerides, HDL and a significant increase in plasma PA2. This study reveals markers of oxidative stress in type 2 diabetes compared to the non-diabetic healthy control group. The results of some oxidative stress markers correlate with lipid profile in reducing risks associated with diabetic dyslipidemia. The imbalance in the oxidative stress markers of type 2 diabetic patients reflects the importance of diagnostic and prognostic tools for the medical management of diabetes. They might be good indicators for the risk of complications.

Keywords: Oxidative stress markers, Lipid profile, type 2 diabetes, complications.