

**AFLATOXIN B1 EXPOSURE AND LIPID LEVELS OF PREGNANT  
WOMEN IN ABEOKUTA, NIGERIA: A Cross-Sectional Study**

**MAMMAN, DEBORAH CALEB  
(20PCP02166)**

**JULY, 2022**

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**BY**

**MAMMAN, DEBORAH CALEB  
(20PCP02166)  
B.Sc. Biochemistry, Bingham University, Karu.**

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

**JULY, 2022**

## **ACCEPTANCE**

This is to attest that this thesis is accepted in partial fulfilment of the requirements for the award of the degree of Master of Science (M.Sc.) in Biochemistry in the Department of Biochemistry, College of Science and Technology, Covenant University, Ota.

**Mr. Taiwo B. Erewunmi**  
(Secretary, School of Postgraduate Studies)

**Signature & Date**

**Prof. Akan B. Williams**  
(Dean, School of Postgraduate Studies)

**Signature & Date**

## **DECLARATION**

**I, MAMMAN, DEBORAH CALEB**, with matriculation number (**20PCP02166**), affirm that I carried out this research under the Supervision of Dr. O. A. ROTIMI of the Department of Biochemistry, Covenant University. I attest that this thesis has not been submitted elsewhere, in whole or in part, for the award of any degree. All the materials and scholarly publications used in the thesis have been adequately acknowledged.

**MAMMAN, DEBORAH CALEB**

**Signature & Date**

## **CERTIFICATION**

We hereby, certify that this dissertation titled “**AFLATOXIN B1 EXPOSURE AND LIPID LEVELS OF PREGNANT WOMEN IN ABEOKUTA, NIGERIA**” is an original research work carried out by **MAMMAN, DEBORAH CALEB** with matriculation number (**20PCP02166**) from the Department of Biochemistry, College of Science and Technology, Covenant University, Ota, Ogun State, Nigeria, under the Supervision of Dr. O. A. ROTIMI. We reviewed the work and determined that it meets the requirements for the award of the degree of Master of Science (M.Sc.) in Biochemistry.

**Dr. Oluwakemi A. Rotimi**  
(Supervisor)

**Signature & Date**

**Prof. Israel S. Afolabi**  
(Head of Department)

**Signature & Date**

**Dr. Olaniyi T. Adedosu**  
(External Examiner)

**Signature & Date**

**Prof. Akan B. Williams**  
(Dean, School of Postgraduate Studies)

**Signature & Date**

## **DEDICATION**

I dedicate this research to God and to my family.

## **ACKNOWLEDGEMENT**

I would like to appreciate God for the completion and for the success of this research, for His grace, mercies and provisions throughout my master's degree.

I also want to appreciate the chancellor of Covenant University, Bishop (Dr.) David Oyedepo, the Vice Chancellor, Prof. Abiodun H. Adebayo, the Dean of School of Postgraduate Studies, Prof. Akan B. Williams, and the Sub-Dean of School of Postgraduate Studies, Dr. Emmanuel O. Amoo, for the platform to carry out this research.

I would also like to acknowledge my supervisor, Dr. O. A. Rotimi, for her continuous guidance, mentorship, support and extreme patience throughout the duration of this research, and to Prof. S. O. Rotimi, for his constant support and assistance.

Last but not least, I would like to appreciate my amazing family and my friends for their consistent cheer, supports, prayers, words of encouragements and assistance, God bless you all.

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## LIST OF ABBREVIATIONS

AF	Aflatoxin
AFB	Aflatoxin B
AFG	Aflatoxin G
AFM	Aflatoxin M
CVD	Cardiovascular Disease
CYP	Cytochrome P
FFA	Free Fatty Acid
GDM	Gestational Diabetes Mellitus
HCC	Hepatocellular Carcinoma
HDL	High Density Lipoprotein
IGF	Insulin-like Growth Factor
LDL	Low Density Lipoprotein
SGA	Small for Gestational Age
TG	Triglyceride

## ABSTRACT

Aflatoxins are mycotoxins produced naturally by the *Aspergillus* fungi and are commonly found in poorly stored crops. The most toxic of these compounds, aflatoxin B1 (AFB1), has been well studied in pregnant women and has been linked to pre-term delivery, low birth weight, etc. and also causes other adverse health effects on the child due to its ability to cross the placental barrier. Some animal studies indicated that AFB1 increased lipid levels over the normal range. However, there has been few data concerning an association between AFB1 and lipid levels in humans. This study investigated the association between AFB1-albumin adducts and cholesterol, triglyceride and HDL in pregnant women in their first and third trimesters. Cholesterol and triglycerides were analyzed using commercially available kits (Randox), while AFB1-albumin levels were assayed using ELISA kit. All statistical analysis were carried out using stata software package. The mean  $\pm$  standard deviation values of total cholesterol and total triglycerides showed a significant increase ( $p < 0.05$ ) from  $75.378 \pm 29.154$  mg/dl and  $73.769 \pm 23.703$  mg/dl in the first trimester to  $98.906 \pm 26.868$  mg/dl and  $126.241 \pm 29.281$  mg/dl in the third trimester, respectively. HDL1 cholesterol levels decreased from  $55.734 \pm 18.317$  mg/dl in the first trimester to  $52.79 \pm 16.12$  mg/dl in the third trimester while HDL2 cholesterol levels increased from  $48.127 \pm 18.521$  mg/dl in the first trimester to  $51.243 \pm 14.99$  mg/dl in the third trimester. HDL1 and HDL2 triglyceride both increased from  $40.396 \pm 15.935$  mg/dl and  $28.994 \pm 7.678$  mg/dl in the first trimester to  $47.077 \pm 20.968$  mg/dl and  $30.91 \pm 10.161$  mg/dl in the third trimester, respectively. AFB1-albumin adducts significantly ( $p < 0.05$ ) decreased from  $8.467 \pm 4.812$  ng/ml in the first trimester to  $6.454 \pm 2.725$  ng/ml in the third trimester. The association between AFB1 albumin adducts and total cholesterol was negatively weak ( $p = 0.096$ ) in the first trimester and positively weak ( $p = 0.463$ ) in the third trimester. Likewise that of AFB1-albumin adducts and total triglyceride was negatively weak ( $p = 0.438$ ) in the first trimester and positively weak in the third ( $p = 0.051$ ). The results presented in this study showed weak associations between AFB1-albumin adducts and total cholesterol, and AFB1-albumin adduct and total triglyceride in the first trimesters of pregnant women, further studies can be carried out to investigate more on this association.

**Keywords:** *Aflatoxin B1, lipid levels, pregnant women*