

Sudan University of Science and Technology

College of Graduate Studies

Association of Placental **Thickness and Estimated Fetal
Weight in pregnant Sudanese Women**

**علاقة سمك المشيمة ووزن الجنين المتوقع لدى
النساء السودانيات**

**A Thesis Submitted for Partial Fulfillment of
the Requirements of M.Sc. Degree in
Medical Diagnostic Ultrasound.**

By

Younis Ahmed Haj Ali

Supervised by

Dr.Muna Ahmed Mohamed AboShanab

May 2015

Dedication

- *To the soul of my father.*
- *To my mother.*
- *To my wife and daughters.*
- *To my brothers and family.*

Acknowledgement

*I would like to express my deepest gratitude and sincere appreciation to my faithful supervisor **Dr. Muna Abo Shanab** for her continuous help, support, guidance and encouragement to complete this work. Without her supervision and constant help this dissertation would not have been possible.*

*My gratitude and appreciation extend to my college **Alabbas Osman** , the sonologist in Omdurman Maternity Hospital, for his patience and greater help during the practical part of this study.*

Abstract

The purpose of this descriptive study is to investigate the relationship between the placental thickness and estimated fetal weight in normal Sudanese pregnant women. The data collected in Omdurman Maternity Hospital in Omdurman from November 2014 to February 2015. Fifty two pregnant women in second and third trimesters were scanned by ultrasound machine Toshiba-power vision-6000. Fetal weight was estimated by measurement of biparietal diameter (BPD) and abdominal circumference (AC). Placental thickness was measured in a longitudinal section at the point of insertion of the umbilical cord.

The data is analyzed by using Statistical Package for Social Sciences (SPSS). Results of the study showed that there is strong positive correlation between placental thickness and estimated fetal weight ($r = 0.836$) and ($p = 0.01$) and both are firmly increased with fetal age. The results also showed linear regression between them. The study showed that the fetal weight increases by 126 gm / each one mm of placenta thickness. Researcher noticed that with

the same Placental thickness there were different fetal weights. However, the normality of fetal weight and fetal development can be followed by measuring Placental thickness.

ملخص الدراسة

يهدف هذا البحث الوصفي لدراسة العلاقة بين سمك المشيمة و وزن الجنين المتوقع في الحمل الطبيعي عند النساء السودانيات. جمعت بيانات هذه الدراسة من مستشفى الولادة بامدرمان في الفترة بين نوفمبر 2014 الى فبراير 2015. شملت الدراسة 52 سيدة حامل في الثلثين الثاني و الثالث من الحمل. تم الكشف على السيدات بالموجات فوق الصوتية لاجراء الفحص الروتيني للحمل و من ثم لاجراء هذه الدراسة. تم تقدير وزن الجنين عن طريق قياس القطر الجانبي للرأس و محيط البطن. سمك المشيمة تم قياسه في نقطة انغراس الحبل السري فيها.

نتائج الدراسة التي استعمل فيها برنامج التحليل الإحصائي للعلوم الاجتماعية ال (SPSS)، اظهرت ان هناك ارتباط قوى و موجب بين سمك المشيمة و الوزن المقدّر للجنين (معامل الارتباط $r = 0.836$) حيث ان الاثنين يزيدان باطراد بزيادة عمر الجنين. كما ان الرسم البياني وضح العلاقة الخطية بينهما. الدراسة

اظهرت ان وزن الجنين يزيد 126 جم عند زيادة سمك المشيمة بمقدار 1 مم. الباحث لاحظ من خلال الدراسة انه عند السمك المعين للمشيمة يمكن ان تتعدد الاوزان المقدرة للجنين. الدراسة خلصت الي انه من خلال قياس سمك المشيمة يمكن متابعة وزن الجنين و التطور الطبيعى لنمو الحمل . و يمكن اثبات فعالية هذه الدراسة بزيادة عدد الحالات و متابعة الجنين بعد الولادة.

Table of Contents

No	Subject	Page No
Chapter 1	Introduction	1
1-1	Introduction	1
1-2	Problem of the study	3
1-3	Objectives of the study	3
1-3-1	General Objective	3
1-3-2	Specific Objectives	3
1-4	Significance of the Study	3
1-5	Overview of the study	4
Chapter 2	Literature review	5
2-1	Anatomy of placenta	5
2-1-1	Development of placenta	5

a	Changes in the Trophoplast	5
b	ChorionFrondosum and Decidua Basalis	6
2-1-2	Structure of the Placenta	7
2-1-3	Full Term Placenta	8
2-1-4	Circulation of the Placenta	10
2-1-5	Placental Grading	11
2-1-6	Umbilical Cord	14
2-2	Physiology of Placenta	15
2-2-1	Nutrition	15
2-2-2	Excretion	16
2-2-3	Protection	16
2-2-4	Production of Hormones	17
2-2-5	Other functions	18
2-3	Pathology of Placenta	18

No	Subject	Page No
2-3-1	Hydatidiform Mole	18
a	Total Hydatidiform Mole	18
b	Partial Hydatidiform Mole	19
c	Invasive Hydatidiform Mole	19
2-3-2	Choriocarcinoma	19
2-3-3	Intervillous Thrombosis	20
2-3-4	Placental Infarcts	20
2-3-5	Placental Abruptio	21
2-3-6	Placenta Circumvallata	22

2-3-7	Placenta previa	22
2-3-8	Placenta Accreta	23
2-3-9	Villitis	25
2-3-10	Chorioamnionitis	26
2-4	Previous Study	27
Chapter 3	Materials and Method	29
3-1	Population of the Study	29
3-2	Area and Duration of the Study	29
3-3	Equipments	29
3-4	Method of Data Collection	29
3-5	Data Analysis	30
Chapter 4	Results	31
Chapter 5	Discussion, Conclusion and Recommendations	41
	Discussion	41
	Conclusion	43
	Recommendations	44
	References	45
	Appendix 1	47
	Appendix 2	62

List of Tables

Table	4-1	show	descriptive	statistics	of	all
variables.....						32

Table 4-2: the correlation between the placental thickness and
BPD.....33

Table 4-3: correlation between placental thickness and
AC.....35

Table 4-4: correlation between placental thickness and fetal
age.....37

Table 4-5: correlation between placental thickness and estimated
fetal weight.....39

List of Figures

Fig 2-1: structure of the placenta.....	7
Fig 2-2 the full-term placenta.....	9
Fig 2-3: placental circulation.....	11
Fig 2-4: placental grading.....	13
Fig 2-5: Grade 3 Placenta.....	14
Fig 2-6: Normal Cord Insertion.....	15
Fig 2-7: Placental abruption.....	21
Fig 2-8: Circumvallate Placenta	22
Fig 2-9: placenta previa	23
Fig 2-10: Placenta accrete	25
Fig4-1: scatter plot of biparietal diameter with placental thickness.	34
Fig4-2: scatter plot of AC with placental thickness.....	36
Fig 4-3 scatter plot of fetal age with placental thicknes.....	38
Fig 4-4: scatter plot of estimated fetal weight with Placental thickness.....	40

