

Dedication

To;

my parents...

my husband...

and my daughter...

Manal

Acknowledgment

First of all, I thank Allah the Almighty for helping me complete this project. I thank Dr. Elsafi Ahmed, my supervisor, for his help and guidance.

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Manal

Tables of Contents

Topic	Page number
Dedication	I
Acknowledgement	II
Table of contents	III
English Abstract	V
Arabic Abstract	VI
List of abbreviation	VII
List of figures	VIII
List of tables	X
Chapter One	
Introduction	
1-1 Introduction	1
1-3 Objectives	3
1-5 Overview of study	3
Chapter Two	
Literature Review	
Theoretical background	
2-1 Anatomy and physiology of placenta	4
2-2 Anatomy and physiology of umbilical cord	7
2-3 Placenta and diabetes	8
2-4 Umbilical cord and diabetes	11
2-5 Normal Sonographic appearance of placenta and umbilical cord	11
2-6 Umbilical artery Doppler assessment	16
2-7 Abnormal Doppler wave form	17
Previous studies	20
Chapter Three	
Material & Methodology	
3-1 Material	24
3-2 Methodology	25

Chapter Four	
Results	
Results and Analysis	28
Chapter Five	
Discussion, Conclusions and Recommendations	
5-1 Discussion	39
5-2 Conclusion	42
5-3 Recommendations	42
References	43
Appendices	45

Abstract

Doppler ultrasound of the umbilical artery is a method for evaluating fetoplacental blood flow. Together with the measurement of the placental thickness, Ultrasonography becomes an important way of assessing high risk pregnancy caused by diabetes.

Objective: Our purpose in this study was to evaluate the effect of diabetes on fetal umbilical artery blood flow and the placental thickness.

Study design: Doppler measurements of umbilical artery indices and placental thickness were taken in 50 diabetic pregnant women in the third trimester, 25 with gestational diabetes and 25 with preexisting diabetes together with 10 normal control group. The study was carried out in El Academy Charity Hospital in Khartoum.

Results: The placental thickness, S/D ratio, pulstility index and resistance index correlated significantly with the mean of average glucose level. The difference between the mean thickness of the placenta in the normal control group and tested group was 3.18 cm and 5.15 cm respectively. This was significant at $p=0.05$ using t-test with $t=14.28$ and $p<0.000$. Likewise, the difference in S/D ratio with the mean of 2.53 and 2.76 respectively in the control and test groups, was significant at $p=0.05$ using t-test with $t=2.13$ and $p<0.004$. The difference in PI was also significant between the control group and test group with the mean of 0.81 and 0.92 respectively. $p=0.05$ using t-test at $t=2.79$ and $p< 0.003$. RI mean readings were 0.52 and 0.63 in the control and test groups respectively. The difference was significant at $p= 0.05$ using t-test at $t=3.79$ and $p<0.000$.

Conclusions: The results showed that there has been a significant correlation between the average glucose level and umbilical artery indices and placenta thickness. The difference between test and control group was significant in all umbilical artery indices and placenta thickness. Surveillance of high-risk fetuses with ultrasound assessment of the umbilical artery and placenta could result in decrease in fetal mortality and morbidity.

ملخص الدراسة

دوبلر بالموجات فوق الصوتية للشريان السري هو وسيلة لتقييم تدفق الدم للجنين. جنبا إلى جنب مع قياس سماكة المشيمة، الموجات فوق الصوتية تصبح وسيلة هامة لتقييم الحمل عالي المخاطر الناجمة عن مرض السكري.

الهدف: كان هدفنا في هذه الدراسة هو تقييم تأثير مرض السكري على تدفق الدم الشريان السري للجنين و علي سماكة المشيمة.

تصميم الدراسة: تم قياس مؤشرات الشريان السري بالدوبلر و سمك المشيمة في 50 امرأة حامل مصابة بداء السكري في الثلث الأخير. 25 كانوا يعانون من مرض السكري الحلمي و 25 مصابات بمرض السكري من قبل جنبا إلى جنب مع 10 من النساء الحوامل للمقارنة. أجريت الدراسة في المستشفى الأكاديمي الخيري في الخرطوم.

النتائج: كل المقاييس و المؤشرات كانت متأثرة بشكل كبير بمتوسط مستوى الجلوكوز. كان الفرق بين سمك متوسط المشيمة في المجموعة الضابطة و المجموعة المختبرة 3.18 سم و 5.15 سم على التوالي. كان هذا ذو دلالة إحصائية عند $P = 0.05$ باستخدام اختبار t مع $T = 14.28$ و $p < 0.000$ وبالمثل، كان الفارق في S / D نسبة مع متوسط 2.53 و 2.76 على التوالي في المجموعتين الضابطة و الاختبار، و ذات دلالة إحصائية عند $P = 0.05$ باستخدام اختبار t مع $T = 2.13$ و $p < 0.004$. كان الفارق في PI ذات دلالة إحصائية بين المجموعة الضابطة و مجموعة اختبار مع متوسط 0.81 و 0.92 على التوالي أيضا. $P = 0.05$ باستخدام اختبار t في $T = 2.79$ و $p < 0.003$. كان متوسط قراءات RI 0.52 و 0.63 في المجموعتين الضابطة و الاختبار على التوالي. كان الفارق كبيرا عند $P = 0.05$ باستخدام اختبار t في $T = 3.79$ و $p < 0.000$.

الاستنتاجات: أظهرت النتائج أن هناك علاقة ذات دلالة إحصائية بين متوسط مستوى الجلوكوز ومؤشرات الشريان السري و سمك المشيمة. كان الفرق بين الاختبار و لمجموعة الضابطة كبيرا في جميع مؤشرات الشريان السري و سمك المشيمة. مراقبة الأجنة عالية المخاطر مع تقييم الموجات فوق الصوتية للشريان السري والمشيمة يمكن أن يؤدي إلى انخفاض في معدل الوفيات والمرضاة للجنين.

List of abbreviations

AVGL	Average Glucose Level
D	Diastole
DM	Diabetes Mellitus
FWV	Flow Velocity Waveform
GA	Gestational Age
GDM	Gestational Diabetes Mellitus
HCG	Human Chorionic Gonadotropin
IDDM	Insulin Dependent Diabetes Mellitus
IUGR	Intra Uterine Growth Retardation
NIDDM	Non Insulin Dependent Diabetes Mellitus
PEDM	Pre Existing Diabetes Mellitus
SPSS	Statistical Package for Social Sciences
SYS	Systole
TNF	Tumour Necrosis Factor
US	Ultrasound
WKS	Weeks

List of figures

Figure	Title	Page
Figure 2-1	Human placenta barrier between the fetal and maternal blood flows	5
Figure 2-2	Maternal blood fills the inter villous space, nutrient, water and gases are actively and passively exchange, then deoxy genated blood is displaced by the next maternal pulse	6
Figure2-3	Ultrasound appearance of normal umbilical cord	11
Figure 2-4	Ultrasound appearance of normal relaxed placenta	11
Figure 2-5	Ultrasound image of a normal placenta with normal hypo echoic pattern	12
Figure 2-6	Ultrasound, color - normal umbilical cord	12
Figure 2-7	Ultrasound appearance of normal umbilical cord	13
Figure 2-8	Ultrasound, color -appearance of normal umbilical cord	13
Figure 2-9	Power Doppler ultrasound of the normal wave form of umbilical artery (Tooth appearance)	14
Figure 2-10	Color Doppler Ultrasound of normal wave form of umbilical artery	14
Figure 2-12	Systole (Sys) and diastole (D) are identified in green Note that diastole is less at 20 weeks (yellow ellipse) than at 36 weeks (red ellipse).	17
Figure 2-13	Graphs illustrate amount of blood during diastole and weeks of pregnancy	18
Figure 2-14	Doppler wave form illustrates absent diastolic flow during diastole	19
Figure 2-15	Illustrates reverse diastolic flow during diastole (blue circle)	20
Figure 3-1	3D Ultrasound Machine (Xario- Toshiba)	24
Figure 4-1	DM TYPES	28
Figure 4-2	DM TREATMENT	29
Figure 4-3	DM CONTROL	30
Figure 4-4	Comparison of Means between Test and Control in age	32
Figure 4-5	Comparison of Means between Test and Control in GEST. AGE/W	33
Figure 4-6	Comparison of Means between Test and Control in PLC	34

	THICKNESS	
Figure 4-7	Comparison of Means between Test and Control in S/D RATIO	35
Figure 4-8	Comparison of Means between Test and Control in PI	36
Figure 4-9	Comparison of Means between Test and Control in RI	37

LIST OF TABLES

Table	Title	Page
Table 4-1	Frequency distribution of both type of diabetes for 50 patients	29
Table 4-2	Frequency distribution of both type of treatment for 50 patients	30
Table 4-3	Frequency distribution for control for 50 patients	31
Table 4-4	Mean of average glucose level	32
Table 4-5	Correlation between average glucose level, placental thickness,S/D ratio ,PI and RI	32
Table 4-6	Compares means between test and control group in age by years	33
Table 4-7	Compares means between test and control group in gestational age by weeks	34
Table 4-8	T-test of placenta thickness	35
Table 4-9	T-test S/D ratio	36
Table 4-10	T-test of pulstility index	37
Table 4-11	T-Test of resistive index	38