



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



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شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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MONA MAGHRABY



Doppler Ultrasound Assessment of Fetal MCA and Umbilical Arteries in Patients with Gestational Diabetes versus Normal Pregnancies

Thesis

*Submitted in Partial fulfillment of M.D. Degree in
Diagnostic Radiology*

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سببنا انك لا تعلم لنا
إلا ما علمتنا إنك أنت
العليم العظيم

صدق الله العظيم

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List of Contents

Title	Page No.
List of Tables	i
List of Figures	ii
List of Abbreviations.....	iv
Introduction.....	1
Aim of the Work.....	3
Review of Literature	
☞ Pathophysiology, Risk Factors and Consequences OF GDM.....	4
☞ Principles of Umbilical Artery & Middle Cerebral Artery Doppler Ultrasonography	18
☞ Doppler Sonography of Umbilical Artery and Fetal MCA in Pregnancies Complicated with Gestational Diabetes Mellitus	32
Patients and Methods	39
Results.....	46
Case Presentation	58
Discussion.....	68
Conclusion and Recommendations	82
Summary	83
References	86
Arabic Summary.....	١

List of Tables

Table No.	Title	Page No.
Table (1):	Risk factors for GDM	13
Table (2):	Fetal biometry in control versus patients group:.....	46
Table (3):	Doppler parameters in control versus patients group:	48
Table (4):	Maternal & fetal outcome in control versus patients group:	50
Table (5):	Correlation of UA & MCA doppler parameters with BPD, AFI & FHR in patient group:	53
Table (6):	Correlation of UA & MCA doppler parameters with RBS & HBA1C in patient group:.....	55
Table (7):	Correlation of UA & MCA doppler parameters with neonatal complication in patient group:	56
Table (8):	Correlation of UA & MCA doppler parameters with maternal complication in patient group:	57

List of Figures

Fig. No.	Title	Page No.
Figure (1):	β -cell, blood glucose, and insulin sensitivity during normal pregnancy and GDM.....	8
Figure (2):	Organs involved in the pathophysiology of GDM	12
Figure (3):	Pathogenesis of hyperinsulinemia in fetus	17
Figure (4):	Sampling sites for Doppler US of the umbilical artery	21
Figure (5):	Angle of insonation	22
Figure (6):	Umbilical artery waveforms.....	23
Figure (7):	Abnormal cerebroplacental ratio.....	25
Figure (8):	Color flow mapping of circle of Willis	28
Figure (9):	Acceptable middle cerebral artery Doppler shift waveform	29
Figure (10):	Doppler US of the middle cerebral artery in a single fetus	30
Figure (11):	Cerebral vasodilation (brain sparing effect).....	36
Figure (12):	MCA PI in control versus patient group.....	49
Figure (13):	Neonatal complications in control versus patient group.....	52
Figure (14):	Maternal complications in control versus patient group.....	52
Figure (15):	(A&B) show gestational age 31+6 weeks gestation, (C&D) show Doppler waveforms of MCA and UA. (E&F) show ultrasound evidence of tricuspid regurgitation	59
Figure (16):	(A&B) show Doppler waveforms of MCA and UA, (C) shows femur length with corresponding gestational age 32+6 days.....	60

List of Figures (Cont...)

Fig. No.	Title	Page No.
Figure (17):	(A&B) show Doppler waveforms of MCA and UA at 31 + 2 GA fetus.....	61
Figure (18):	(A, B & C) shows gestational age of 29 weeks by scan. (D) shows vertical deepest pocket of amniotic fluid (E & F) show Doppler waveforms of MCA and UA.	63
Figure (19):	(A, B & C) shows gestational age of 37+1. (D) shows small pocket of amniotic fluid (E & F) show Doppler waveforms of MCA and UA.....	65
Figure (20):	(A, B&C) show gestational age at scan 33+1 day. (D&E) show Doppler waveforms of MCA and UA.	67

List of Abbreviations

Abb.	Full term
<i>AC</i>	<i>Abdominal circumference</i>
<i>AEDF</i>	<i>Absent end-diastolic flow</i>
<i>AFV</i>	<i>Amniotic fluid volume</i>
<i>BPD</i>	<i>Biparietal diameter</i>
<i>BPP</i>	<i>Biophysical profile</i>
<i>CPR</i>	<i>Cerebroplacental ratio</i>
<i>CVD</i>	<i>Cardiovascular disease</i>
<i>ED</i>	<i>End-diastolic velocity</i>
<i>EFW</i>	<i>Estimated fetal weight</i>
<i>FFA</i>	<i>Free fatty acid</i>
<i>FL</i>	<i>Femur length</i>
<i>GDM</i>	<i>Gestational diabetes mellitus</i>
<i>GLUT4</i>	<i>Glucose transporter 4</i>
<i>HC</i>	<i>Head circumference</i>
<i>IGF-1</i>	<i>Growth factor 1</i>
<i>IUGR</i>	<i>Intrauterine growth restriction</i>
<i>LGA</i>	<i>Large for gestational age</i>
<i>MCA</i>	<i>Middle cerebral artery</i>
<i>NICU</i>	<i>Neonatal intensive care unit</i>
<i>NST</i>	<i>Non-stress test</i>
<i>PCOS</i>	<i>Polycystic ovarian syndrome</i>
<i>PI</i>	<i>Pulsatility index</i>

List of Abbreviations (Cont...)

Abb.	Full term
<i>PSV</i>	<i>Peak systolic velocity</i>
<i>REDF</i>	<i>Reversed end-diastolic flow</i>
<i>RI</i>	<i>Resistive index</i>
<i>S/D</i>	<i>Systolic / diastolic</i>
<i>UA</i>	<i>Umbilical Artery</i>

INTRODUCTION

Gestational diabetes mellitus (GDM) is one of the most frequently recorded morbidities of pregnancy. The incidence of GDM has risen over the past 30 years, mainly owing to a global increase in the prevalence of overweight and obesity and an increased pregnancy rate among women aged older than 35 years (*Scott-Pillai et al., 2013*).

The physiopathologic process underpinning the fetal adverse outcomes of maternal GDM is not fully understood but seems to be multifactorial. According to the Hyperglycemia and Adverse Pregnancy Outcomes study, the presence of maternal hyperglycemia is strongly associated with macrosomia and fetal hyperinsulinemia. Furthermore, elective cesarean delivery, neonatal hypoglycemia, premature delivery, birth injury, pre - eclampsia, admission to the neonatal intensive care unit, and hyperbilirubinemia are associated with the presence of GDM (*Dantas et al., 2018*).

Previous studies showed that materno–placental blood flow might change due to hyperglycemia during the pregnancy. As a consequence, redistribution of blood flow occurs from the peripheral vessels to the brain as a compensatory mechanism to the changes in placental hemodynamics (*Simanaviciute et al., 2006*).

This can be well traced by the Doppler ultrasound measurements of the umbilical (UA) and middle cerebral arteries (MCA) of the fetus (*Dorsey et al., 2018*).

Recently the assessment of the fetal cerebral blood flow velocities has become a suggested method in high-risk pregnancies (*Zanjani et al., 2014*).

AIM OF THE WORK

The aim of this work was to assess the fetal cerebral hemodynamic changes in diabetic pregnancies in comparison to normal pregnancies and its association with placental hemodynamic changes & pregnancy outcome (MCA & umbilical artery duplex).