Uterine arteries Doppler in the early second trimester in correlation to fetal birth weight

Thesis

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By

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جامعة القاهرة / هيئة التدريس
الدراسات العليا

محضر
اجتماع لجنة الحكم على الرسالة المقدمة من
الطبيب / عمرو شريف محمد عبد القادر
توطئة للحصول على درجة الماجستير / الدكتوراه
في

تحت عنوان : باللغة الانجليزية : Uterine artery Doppler in the early second trimester in correlation to fetal birth weight

باللغة العربية : دوبلر الشريان الرحمي في الثلث الأول من الحمل وعلاقته بوزن الجنين

بناء على موافقة الجامعة بتاريخ ١٣ / ١ / ٢٠١٠ تم تشكيل لجنة الفحص والمناقشة للرسالة المذكورة أعلاه على النحو التالي :-

١. أ.د. عمر عبد العزيز خير عبد الجبار ..... عن المشرفين
٢. أ.د. أسامة السويس ..... ممتحن داخلي
٣. أ.د. أحمد منصور ..... ممتحن خارجي

بعد فحص الرسالة بواسطة كل عضو منفردا وكتابة تقارير منفردة لكل منهم انعقدت اللجنة مجتمعة في يوم : الاربعاء بتاريخ ٢٣ / ٣ / ٢٠١٠ بقسم النساء مدرج بكلية الطب – جامعة القاهرة وذلك لمناقشة الطالب في جلسة علنية في موضوع الرسالة والنتائج التي توصل اليها وكذلك الأسس العلمية التي قام عليها البحث .

قرار اللجنة

تم قبول الرسالة

توقيعات أعضاء اللجنة :-

المشرف الممتحن — الممتحن الداخلي — الممتحن الخارجي

عصام

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Abbrev.	Abbreviations
%	Percentile
2D	Two Dimensional
AC	Abdominal Circumference
Ao	Aorta
BPD	Biparietal Diameter
BW	Body weight
Cm	Centimeter
Cm/s	Centimeter per second
CRL	Crown-Rump Length
CTG	Cardiotocogram
Cu2+	Ionized copper
CW	continuous wave
DA	ductus arteriosus
FHR	fetal heart rate
FL	Femur Length
FP	Fetoplacental
FVW	Flow velocity waveforms
G	Gram
GLUT	glucose transport proteins
hCG	human chorionic gonadotropin
hPL	Human placental lactogen
I.V.S.	intervillous space
IgG	immunoglobulin G
IUGR	intrauterine growth restricted
Kg	Kilogram
l/min	Liter per minute
LA	left atrium
LDL	low-density lipoprotein
LV	Left ventricle
Max	Maximum
Min	Minimum
ml/min	Milliliter pro minute
Mm	Millimeter

mmHg	Millimeter Mercury
MPT	Main pulmonary trunk
PA	pulmonary artery
PI	Pulsatility Index
PIH	Pregnancy induced hypertension
PO2	oxygen partial pressure
PTH-rP	Parathyroid hormone-related protein
PW	Pulsed wave
RI	Resistance Index
RV	right ventricle
S/D	Systolic over Diastolic ratio
SD	Standard Deviation
UP	Uteroplacental
US	Ultrasound
Wt	Weight

Keywords:
uterine artery Doppler, birth weight, normal pregnancy, prediction, Pulsatility index, resistance index, systolic over diastolic ratio, early second trimester.

Abstract:

Objective: To establish whether uterine artery resistance index (RI), Pulsatility index (PI) and systolic over diastolic ratio (S/D) in healthy pregnant women in early second-trimester has a relation with birth weight.

Methods: This was a cross-sectional study of 32 pregnant women attending routine ultrasound examination at 16 – 22 weeks' gestation. Uterine artery RI, PI and S/D were measured. Birth weight and customized centiles, calculated by centile calculator version 5.12.1 of birth weights were plotted against Doppler value using Pearson product-moment correlation coefficient.

Results: The Pearson product-moment correlation coefficients in evaluating the Pulsatility Indices (PI), Resistance Indices (RI) and Systolic flow over diastolic flow ration (S/D) were , 0.05, -0.07 and 0.02 for absolute weights and -0,21, -0.09 and -0.06 for customized percentiles respectively.

Conclusion: A non significant correlation exists between birth weight, customized percentiles and first-trimester uterine artery Doppler parameters.

Introduction

In a pregnancy, a fetus grows inside the maternal uterus depending on many interacting factors. The result of these factors is represented by the fetal weight and well being. *Kaufmann and associates 2003*

The neonatal weight should be inside a certain range, where we can say that this weight is normal. Growth curves have been established to set limits to the lower and upper ranges of the neonatal weight. If this weight is normal, we can then conclude that the intrauterine environment was suitable for normal fetal growth. The proper neonatal weight is therefore one of the signs of normal placental functions. *Audibert F et al 2005.*

Measuring the uterine artery flow can give us an idea about the speed velocity of the uterine artery blood flow. Measurement of the uterine artery flow velocity can give us an idea about the blood flow to the uterus and therefore to the fetus. This can give us an idea about the amount of nutrients that reach the fetus during the antenatal period. *Assali et al 1953*

The perfusion of the placenta and therefore the fetus depends on the uterine supply of blood to the uterus. Therefore, the growth of the fetus in utero should depend on it as it determines the placental sufficiency as well. As an outcome, the neonatal weight reflects the normality of this system, and hence the normality of the placental functions. *Campbell et al 1983*

The first Doppler velocimetry in the analysis of human fetal blood flow was published in 1977 by Fitzgerald and Drumm.

Aim of work