

الآية



هُوَ الَّذِي يُصَوِّرُكُمْ فِي الْأَرْحَامِ كَيْفَ يَشَاءُ
لَا إِلَهَ إِلَّا هُوَ الْعَزِيزُ الْحَكِيمُ

صَدَقَ اللهُ الْعَظِيمُ

سورة ال عمران الاية (6)

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List of Abbreviations

Abbreviation	Meaning
GA	Gestational age
EFW	Estimated fetal weight
MCA	Middle Cerebral Artery
UA	Umbilical Artery
CPR	MCA/UA- middle cerebral artery/umbilical artery
PI	Pulsatility Index
RI	Resistance Index
CFH	Chronic fetal hypoximia
IUGR	Inter Uterine Growth restriction
BP	Blood pressure
CDC: CTR	Centers for Disease Control and Prevention
GARG	Gestational Age Range Groups
CAC	Cerebral Arteries Circulation

Dedication

This thesis work is dedicated to my parents, who have always loved me unconditionally and whose good examples have taught me to work hard for the things that I aspire to achieve. This work is also dedicated to my husband and children, whom has been a constant source of support and encouragement during the challenges of graduate study and life. I am truly thankful for having them in my life.

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Abstract (English)

BACKGROUND:

Previous studies of the morphological variations and current data of the middle cerebral artery (MCA), has been obtained from the research conducted on adults (Teal et al. 1973) (Ciszek and Ząbek1992). They found that the diameters of the middle cerebral artery were larger in the male than in the female group, but the differences were not statistically significant. The mean middle cerebral artery diameter 2.41(±0.82mm) with insignificant differences were stated between age groups (Tarasów E et al 2007). Another research found that Diameter of M1 segment of the MCA increases approximately 3 times according linear function $y = -0.0705455 + 0.0043678 * x$ with $r=0.65$ from 12 to 40 weeks of gestation, Analysis showed statistically significant differences mean value of M1 segment diameter between all GARGs. There is no statistically significant difference between diameters of left and right M1 segment of MCA in each GARG (J. Gielecki et al.2009). Recent research in twins found there was no significant difference in the MCA PI between the large and small fetuses while the MCA diameter was significantly increased show that measurement of MCA diameter can potentially be used as a tool for assessing resistance. (E. Barzilay et al.2014).

AIMS:

To study the fetus MCA diameter using Doppler ultrasound in fetus complicated of maternal hypertension.

METHODS:

We conducted a Prospective cohort-study of fetuses based on 82 cases data in the UAE. The fetuses divided into two groups. The normal group reserve as a reference because there was no reference values available right now. Fetal assessment included estimated fetal weight, umbilical artery flow, MCA flow and MCA diameter. Paired statistical analysis was used to compare MCA diameter and MCA pulstittly index (PI) between the two groups and the correlation between them and gestational age.

RESULTS:

Inadequate cerebral perfusion was associated with decrease neonatal weight when pregnancies were complicated by hypertension. There was significant difference in MCA PI between the target and control fetuses, with negative correlation between MCA PI and GA. and no significant difference observed in MCA width between the target and control groups however the width increment markedly visible in target group with positive correlation with GA. the observed association between MCA width and MCA PI was insignificant in pregnancies with maternal hypertension -risk.

CONCLUSIONS:

Measurement of fetus MCA diameter using Doppler ultrasound cannot provably be used as a tool for assessing vessel resistance. Further studies are needed to assess the accuracy and

sensitivity of this method as well as the clinical significance of MCA dilatation in the presence of normal Doppler flow indexes.

مستخلص الدراسة Arabic Abstract

جميع الدراسات التي تناولت الاختلافات الشكلية والتشريحية للشريان المخي الاوسط تم الحصول عليها من ابحاث تناولت كبار السن وقد أثبتوا وجود تباين واختلاف من حيث الجنس والعمر كزيادة عرض الشريان عند الرجال دون النساء وان الزيادة تتناسب طرديا مع عمر الشخص مع عدم وجود اختلاف في القياس بين الجهة اليمنى واليسرى من الرأس , اما عن الدراسات التي تمت في الاجنه فقد خلصت الى أن هنالك علاقة طردية بين عرض الشريان وعمر الجنين وان اقصى عرض للشريان يكون 1.6 ملم عند الأسبوع الاربعين كما اثبت دراسة اخرى ان نقصان وزن الجنين ينتج زيادة في عرض الشريان المخي مقارنة بأجنة مثالي الوزن.

الهدف من هذه الدراسة معرفة اذا ما كان قياس الشريان المخي الأوسط في الأجنة بأستخدام الموجات الطيفية الملونه من شأنها ان يعطي التشخيص السريع والدقيق للتغير في مقاومة الشريان لحوامل مصابين بارتفاع ضغط الدم ومقارنته بقياس عرض الشريان عند اجنة لحوامل لا يعانون من اي امراض لمعرفة مدي نسبة اختلاف القياس بين المجموعتين ومدى فعالية هذا الاختلاف في التشخيص.

وقد تم اختيار اطار محدد لعمل وتنفيذ هذه الدراسة التي شملت 82 حالة حمل بجنين واحد قسموا الي مجموعتين 42 حوامل سليمين و 40 حوامل يعانون من ارتفاع ضغط الدم تم تشخيص الاجنة عندهم بنقصان عن الوزن الطبيعي في الفترة من مايو الى اكتوبر 2015 بدولة الامارات العربية المتحدة . تم جمع البيانات للمجموعتين اللتين شملتهما الدراسة عبر استمارة خاصة لكل منهما احتوت علي قياس عوامل جريان الدم المتبع استخدامهما عادة للشريان المخي الاوسط والشريان السرى وقياس وزن الجنين بالجرامات وعمر الجنين استنادا لتاريخ اخر دورة شهرية للحامل بالاضافة الى قياس عرض الشريان المخي الاوسط بواسطة الموجات الطيفية الملونه وبعد التحليل الاحصائي لتلك البيانات ومعرفة العلاقة بين المتغيرات واجراء المقارنات لها تبين ان قياس عرض الشريان المخي الاوسط في الاجنة السليمين يتناسب طرديا مع عمر الجنين وعدم ثبوت ذلك تحليلا في الاجنة الغير سليمين بالرغم من الزيادة الملحوظة لعرض الشريان في الاجنة الغير سليمين مقارنة بالاجنة السليمين كما ان العلاقة بين مقاومة الشريان وعرضه بالنسبة للاجنة في المجموعتين اعطت علاقة سلبية بين المتغيرين مما يعني استقلالهما الكامل عن بعضهما - وبالنظر الى قيمة الوسط الحسابي لعرض الشريان في الاجنة السليمين (0.41 ± 0.08 سم) ومقارنة بالدراسات السابقة التي خلصت الى ان اكبر قياس عند الاسبوع الاربعين لم تتجاوز 2 ملم نستنتج أن هناك نسبة خطأ قاربت الضعف مما يعنى ان طريقة القياس المستخدمة غير دقيقة .

مما سبق نخلص الى ان طريقة القياس باستخدام الموجات الطيفية الملونه غير دقيقة وتحمل نسبة خطأ كبيرة تجاوزت الضعف . بالرغم من ان الزيادة في عرض الشريان في الاجنة الغير سليمين اكبر وملحوظة مقارنة بالاجنة السليمين مما يثبت زيادة عرض الشريان المخي الاوسط نسبة لاصابة الام بارتفاع ضغط الدم مع عدم ارتباط هذا الارتفاع مع النقصان في معامل ضغط الشريان تحليليا.