DEDICATION

....to my beloved parents who sacrificed a lot to be proud of me and to see me a successful son... May Allah all mighty bless them..

AKNOWLEDGEMENT

..I would thank Allah for giving me strong well throughout my life to look always for the best.

I would like to thank (Al-Engas Al-Shahida Nada Medical Center) administration for giving me the facilities for data collection of this research.

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ABSTRACT

Estimation of the correct gestational age for fetuses is quite important in distinguishing between the preterm and term infants in order to do the necessary medical intervention after birth mainly for the preterm infants, in which many parameters have been used to estimate the gestational age including biparital diameter, femur length, head circumference, and abdominal circumference.

The aim of the study was to predict fetal gestational age in the second and third trimesters of pregnancy for a singleton gestation by using the fetal transverse cerebellar diameter, in which its diameter in millimeters was assumed to equal the fetal gestational age in weeks, and compare the transverse cerebellar diameter with biparital diameter and the femur length measurements used to estimate the gestational age for each fetus. A total of 50 gravid women at 15-38 weeks of gestation who attended for serial follow up ultrasound scan at the ultrasound department in (Al-enqas Al-shahida Nada medical center) were recruited in the study. Each pregnant woman had been scanned once. the biparietal diameter, Femur length, and transverse cerebellar diameter where obtained for each fetus and the data were analyzed by excel and SPSS in reference to the expected gestational age calculated from the last menstrual period for each woman.

The expected gestational ages of the singleton fetuses were between 15-38 weeks (mean 26.74), in which 10 cases were between 15-20 week GA, 21 cases between 21-30 week GA, and 19 case between 31-38 weeks GA, which correspond to 20%, 42%, and 38% respectively.

The study showed strong correlation between the transverse cerebellar diameter in millimeters and the expected gestational age in weeks in which the correlation R= 0.921. The paired *t*-test for significance showed a significant difference between the transverse cerebellar diameter in millimeters and the corresponding expected gestational age in weeks at $P = 0.05$, but however it showed no difference between 15-22 weeks of gestation which was statically

significant ($P < 0.02$) and R= 0.95 thus it can be used as a predictor for estimating the gestational age during this period.

The study also showed a strong correlation between the estimated gestational age by the biparietal diameter and the expected gestational age, and between the femur length and the expected gestational age in which the correlation was R=0.973 and R=0.975 respectively, paired *t*-test for significance showed insignificant difference between the estimated gestational age by biparietal diameter and Femur length and the corresponding expected gestational at $P = 0.05$, thus, biparietal diameter and femur length can be used with confidence in estimating gestational age during 15-38 weeks of pregnancy.

ملخص البحث

ان تقدير طول فترة الحمل لدى النساء لذو اهميه كبيره للتفريق بين الاطفال الخُدج والاطفال كاملي النمو وذلك بغرض عمل الترتيبات الطبيه اللازمه بعد الولاده خاصة للأطفال الخُدج, حيث ان هنالك عدة طرق لقياس عمر الجنين اثناء الحمل واكثرها شيوعاً قياس عرض رأس الجنين في مستوى العظم الجداري, وقياس طول عظم فخذ الجنين, وقياس محيط رأس الجنين, وكذلك قياس محيط بطن الجنين.

وهدف هذه الدراسة هي محاولة أمكانية التنبؤ بعمر الجنين في الثلوث الثاني والثالث من الحمل في حالة الحمل بجنين واحد وذلك عن طريق قياس عرض مخيخ الجنين بفرضية أن عرض المخيخ بالمليمتر يساوي عمر الجنين بالأسابيع. اضافة الى مقارنة النتائج المتحصلة من قياس عرض المخيخ بما يقابلها من عمر الجنين بالأسابيع والمتحصله عن طريق قياس عرض رأس الجنين في مستوى العظم الجداري و طول عظم فخذ الجنين. تم الاستعانه بعدد 50 أمرأة حامل بجنين واحد أتت اساسا لهمل فحص دوري بالموجات فوق الصوتية للمتابعه في (مركز الأنقاذ الشهيدة ندى الطبي) لغرض أجراء هذه الدراسه.حيث تراوحت أعمار الأجنه في هذه الدراسه ما بين 15-38 أسبوع. تم عمل فحص بالموجات مره واحده فقط لكل من النساء المتطوعات بحيث تم قياس عمر الجنين عن طريق قياس عرض رأس الجنين عند منطقة العظم الجداري وقياس طول عظم فخذ الجنين أضافة ألى انه تم قياس عرض مخيخ الجنين بالمليمتر, وتم عمل هذه القياسات لكل جنين على حده.

اعمار الاجنه التي شملتها الدراسه كانت بين 15-38 اسبوع (متوسط 26.74)و حيث ان 10 حالات كانت بين 15-20 اسبوع, و 21 حاله كانت بين 21-30 اسبوع, في حين كانت 19 حاله بين 31-38 اسبوع, وهو مايمثل نسب 20%, 42%, و 38% على التوالي.

وأظهرت الدراسة علاقة أرتباط قوية بين عرض مخيخ الجنين بالمليمتر وبين عدد اسابيع الحمل المقابله له والمحسوبه من تأريخ اخر دورة شهرية للحامل, حيث أن الأرتباط R=0.921 , وأظهر أختبار الأختلاف *t*-test وجود أختلاف بين عرض مخيخ الجنين بالمليمتر وبين عمر الجنين الأساسي المحسوب بحيث أنهما لا يتوافقان وقد اعتبرت هذه النتيجه هامه احصائيا عند $P=0.05$, ألا أن هذا الأختلاف غير موجود في الفترة 15-22 أسبوع حيث اعتبرت هذه النتيجه هامه احصائياً ($P<0.02$) وأرتباط (R =0.95)وعليه فأنه بالأمكان تقدير عمر الجنين بالأسابيع بحساب المقابل له بالمليمتر في هذه الفتره عن طريق قياس عرض مخيخ الجنين بحيث أن كل (1) ملم يساوي (1) اسبوع.

وأظهرت الدراسه ايضاً علاقة أرتباط قوية بين عمر الجنين الناتج من قياس عرض رأس الجنين في مستوى منطقة العظم الجداري لرأس الجنين وبين عمر الجنين الأساسي والمحسوب من تأريخ اخر دورة شهرية للحامل, وكذلك بين عمر الجنين بقياس طول عظم الفخذ وبين عمر الجنين الاساسي المحسوب من تأريخ اخر دوره شهريه حيث أن الارتباط R=0.973 , و R=0.975 على التوالي

وأظهر أختبار الأختلاف t-test عدم وجود أختلاف ملحوظ بين عمر الجنين الذي تم قياسه من مستوى منطقة العظم الجداري لرأس الجنين وكذلك عمر الجنين الذي تم قياسه من طول عظم الفخذ , وبين عمر الجنين الأساسي المحسوب $P = 0.05$. وعليه وأعتمادا عى هذه النتائج فأنه يمكن أستخدام طريقة قياس عمر الجنين عن طريق قياس عرض رأس الجنين وقياس طول عظم الفخذ في منطقة العظم الجداري خلال الأسابيع 15-38 من الحمل.

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List of abbreviations

AC	**Abdominal circumference**
BPD	**Biparital diameter**
EDD	**Expected delivery date**
FL	**Femur length**
GA	**Gestational age**
HC	**Head circumference**
LMP	**Last menstrual period**
OFD	**Occipito-frontal diameter**
O-to-O	**Outer to Outer**
O-to-I	**Outer to Inner**
R	**Correlation**
TCD	**Transverse cerebellar diameter**
wk	**Week**