“CORRELATION BETWEEN FETAL TRANSCEREBELLAR DIAMETER AND GESTATIONAL AGE- HOSPITAL BASED OBSERVATIONAL STUDY”

BY

REG.NO. BJ0117005

Dissertation

Submitted to the
KLE Academy of Higher Education and Research,
Belagavi,Karnataka

In Partial Fulfillment
Of the requirements for the degree of

MASTER OF SURGERY
In
OBSTETRICS AND GYNAECOLOGY

GYNAECOLOGY,
JAWAHARLALNEHRUMEDICALCOLLEGE,
BELAGAVI, KARNATAKA.

APRIL – 2020

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH, BELAGAVI, KARNATAKA

ENDORSEMENT BY THE HOD,

PRINCIPAL/HEAD OF THE INSTITUTION

This is to certify that this dissertation entitled**"CORRELATION BETWEEN FETAL TRANSCEREBELLAR DIAMETER AND GESTATIONAL AGE- HOSPITAL BASED OBSERVATIONAL STUDY**is a bonafide research work done by**REG.NO.BJ0117005.**

Dr. KAMAL PATIL$_{\textbf{M.D}}$
Professor & Head
Department of Obstetrics
and Gynaecology
Belagavi– 590010

Date:

Place: BELAGAVI

Dr.N.S.Mahantshetti$_{\textbf{M.D.(Paed)}}$
Principal
J.N.Medical College
Belagavi - 590010

Date:

Place: BELAGAVI

ANTI-PLAGIARISM CHECK – ACCEPTANCE LETTER

JAWAHARLAL NEHRU MEDICAL COLLEGE

(A constituent unit of KLE Academy of Higher Education & Research Deemed-to-be University)

Accredited 'A' Grade by NAAC (2nd Cycle) Placed in Category "A" by MHRD (GoI)

Nehru Nagar, Belagavi-590 010, Karnataka-India

Website : http/www.jnmc.edu
E-Mail : Principal@jnmc.edu

☎ Office :+91-(0)831 2471350
FAX :+91 (0)831-2470759

Ref. No. : MDC/BG/2193 Date : 18/10/2019

To,

REG.NO.BJ0117005.
Postgraduate Student,
Department of Obst. & Gynecology,
2017-18 Batch,
J. N. Medical College,
Belagavi.

Sub: Acceptance Letter

Sir/Madam,

The softcopy of thesis entitled "CORRELATION BETWEEN FETAL TRANSCEREBELLAR DIAMETER AND GESTATIONAL AGE– A HOSPITAL BASED OBSERVATIONAL STUDY" has been submitted for Anti-Plagiarism check through Turnitin software. The scan has been carried out and the scanned output reveals a match percentage of **01% (One percentage)** which is within the acceptable limits of 10% as per the guidelines given by UGC.

Thanking you,

Yours sincerely,

18/10/19

Coordinator
Department of Obst. & Gynecology
J. N. M. C. Belagavi.

Guide.

Chairman,
Antiplagiarism Committee

KAHER BELAGAVI J.N. MEDICAL COLLEGE

ABBREVIATIONS

TCD	-	Transcerebellar Diameter
CRL	-	Crown Rump length
BPD	-	Biparietal diameter
HC	-	Head circumference
AC	-Abdominal Circumference	
FL	- Femur length	
GA	- Gestational age	
FGR	- Fetal growth restriction	
SGA	- Small for gestational age	
LMP	- Last menstrual period	
Wks	- Weeks	
Mnth	-Months	
G	-Gravida	
P	- Para	
L	-Living	
A	-Abortion	
IUD	-Intrauterine death	
PPV	- Positive predictive value	
NPV	- Negative predictive value	
GA Biometry	-	Composite of BPD, HC, AC, FL

ABSTRACT

Objectives

Primary Objective: To Find Correlation between the Transcerebellar Diameter with gestational age in the second and third trimester of the pregnancy.

Secondary Objective: To evaluate the accuracy of TCD as against the conventional parameters of Biparietal diameter, Abdominal circumference, Femur length, Head circumference and composite of (BPD, AC, FL, HC) in Second and third trimester for predicting the gestational age.

Design- A Cross-sectional study

Subjects- 500 pregnant women between 26- 36weeks

Main Outcome Measured- Transcerebellar diameter (TCD), Biparietal diameter (BPD), Abdominalcircumference (AC) and Femur length (FL) were measured. Data was analysed byKarl Pearson's Coefficient, linear regression, multiple regression .Correlation between TCD and GA, GA and various other parameters like (BPD, HC, AC, FL) was computed by above described methods.This data was further used to formulate normogramsat 5th,50th, 90th percentiles.

Results

The mean gestational age of the pregnant women was 23.75±2.67yrs.55% were primigravida were as 45 % were multigravidas. There was statistical correlation between GA and all parameters but correlation between TCD and GA ($r=0.961$, $p<0.001$) was greater than the other parameters .The predictive value of TCD in our study was 98.5% with discrepancy of ±6days compared to actual GAin comparisonto

FL (94.3% with discrepancy of ±12days compared to actual GA), BPD (93.8% with discrepancy of ± 15days compared to actual GA), AC (93.2% with discrepancy of ±15days compared to actual GA),HC (91.2% with discrepancy of ±18days compared to actual GA).

Conclusion

Hence we can conclude that TCD is accurate, new alternative for predicting gestational age.It can be used as reliable parameter for estimating gestational age in second and third trimester of pregnancy especially women who are unaware of LMP or have a dating scan.

TABLE OF CONTENTS

SL. NO.	TOPIC	PAGE NO.
1	INTRODUCTION	1-5
2	AIMS &OBJECTIVES	6
3	REVIEW OF LITERATURE	7-16
4	METHODOLOGY	17-22
5	RESULTS	23-38
6	DISCUSSION	39-44
7	CONCLUSION	45
8	SUMMARY	46
9	BIBLOGRAPHY	47-59
10	ANNEXURE I – CONSENT FOR PARTICIPATION	60-62
11	ANNEXURE II – PROFORMA	63-64
12	ANNEXURE III – ETHICAL CLEARANCE	65
13	ANNEXURE IV - MASTER CHART	66-78

LIST OF TABLES

SL. NO.	DESCRIPTION	PAGE NO.
1	DISTRIBUTION OF PARTICIPANTS BY AGE	23
2	DISTRIBUTION OF PARTICIPANTS BY STATUS OF GRAVIDA	25
3	DISTRIBUTION OF PARTICIPANTS BY GESTATIONAL AGE	26
4	MEAN GESTATIONAL AGE WITH STANDARD DEVIATION	27
5	CORRELATION BETWEEN GA & PAUAMETERS (BPD,HC,AC, FL & TCD) BY KARL PEARSON'S COEFFICIENT METHOD	28
6	CORRELATIONBETWEENGA WITH BPD, HC, AC, FL & TCD BY 2 TAIL SIGNIFICANCE WITH PEARSON'S CORRELATION	32
7	CORRELATION BETWEEN GA WITH GA BIOMETRY BY KARL PEARSON'S COEFFICIENT METHOD	33
8	MULTIPLE LINEAR REGRESSIONAL ANALYSIS BY OTHER VARIABLES	34
9	COMPARISON OF GA BY TCD& GA BY BIOMETRY BY DEPENDENT T TEST	35
10	CORRELATION BETWEEN GA BY TCD WITH GA BIOMETRY BY KARL PEARSON'S METHOD	36
11	NORMOGRAM	37
12	PREDICTIVE ACCURACY OF TCD BY GA	38
13	PREDICTIVE ACCURACY OF BPD, HC, AC & FL	38

LIST OF FIGURES

SL. NO.	DESCRIPTION	PAGE NO.
1	DISTRIBUTION OF PARTICIPANTS BY AGE	23
2	DISTRIBUTION OF PARTICIPANTS BY STATUS OF GRAVIDA	25
3	DISTRIBUTION OF PARTICIPANTS BY GESTATIONAL AGE	26
4	CORRELATION BETWEEN GA & BPD BY KARLSPEARSON'S COEFFICIENT METHOD	29
5	CORRELATION BETWEEN GA & HC KARLS PEARSON'S COEFFICIENT METHOD	29
6	CORRELATION BETWEEN GA &ACKARLS PEARSON'S COEFFICIENT METHOD	30
7	CORRELATION BETWEEN GA & FL KARLS PEARSON'S COEFFICIENT METHOD	30
8	CORRELATION BETWEEN GA &TCD KARLS PEARSON'S COEFFICIENT METHOD	31
9	CORRELATION BETWEEN GA & GA BY BIOMETRY KARLS PEARSON'S COEFFICIENT METHOD	33
10	COMPARISON OF GA BY TCD AND GA BY BIOMETRY KARLS PEARSON'S COEFFICIENT METHOD	35
11	CORRELATION BETWEEN ESTIMATED GESTATIONAL AGE BY TCD WITH GESTATIONAL AGE BIOMETRY	36

INTRODUCTION

1.1 Research Background

Gestational age is a key piece of data used by the obstetricians for successfully providing the antepartum care. It is the most significant information in certain antepartum tests and it helps to formulate specific interventions. Gestational age mainly helps to monitor the fetal growth. Inaccurate determination of fetal maturity via gestational age can lead to increased perinatal morbidity and mortality[1].

Various methods which were used in the past to determine gestational age were a combination of history (which included menstrual history, perception of fetal movements) and physical examination (which included uterine size by bimanual examination in first trimester, fundal height measurement)[2]

In order to focus on the various techniques for determining the Gestational Age, it can be classified into following parts:

Prenatal Techniques

Non-Sonographic Methods for Determining Gestational Age

This is based on Naegele's Rule and Uterine Size. Naegele's Rule mainly establishes on date of last menstrual period by gaining the history from the patient. By +1yr and 7 day and - 3 months to LMP we can establish the EDD. However, sometimes the menstrual history can be misdirecting for various reasons. These includeNumerous women do not precisely review the date of last menstrual period, especially when the pregnancy is unintentional.

1. LMP might be unreliable due to oligomenorrhea, abnormal bleeding, utilization of oral contraceptives
2. Premature ovulation (<day 11) or ovulating exceptionally late (>day 21) in the menstrual cycle[3].

On the other hand, uterine size which is mainly described as the condition of the uterus is defined as a soft and globular pelvic organ.

Gestational age	**Position of Uterus**
12 weeks	Uterus felt just above symphysis pubis
16 weeks	Midpoint of pubic symphysis and umbilicus
24 weeks	At level of umbilicus
28weeks	Junction of lower third and upper two third of distance between umbilicus and ensiform cartilage
36week	Xiphoid process of sternum

The symphysiofundal height in centimetres should be equal to gestational age after 20 weeks. However, the Gestational Age determined by abdominal palpation/ pelvic examination can be inaccurate in cases of in multiple pregnancy, FGR, IUD, full bladder and fibroid.

Perception of fetal movement- Quickening is perception of fetal movement for first time in pregnancy .It is around 19 - 21 week in primigravida and 17 – 19 weeks in multigravida[4].

Sonographic Methods for Determining Gestational Age

It is mainly examined on the basis of the trimester. In the first trimester dating, the sonographic assessment can be done within the first 13 weeks and 6 days to provide an accurate estimation of gestational age. At this stage, the CRL is the parameter which is used to estimate the Gestational age. CRL has accuracy of ± 5-7 days[5]. In respect to this, both transvaginal and transabdominal approaches need to be used to measure the same. Once the CRL exceeds 84 mm, the reliability of this parameter decreases owing to normal embryonic development and variability in anatomic positioning[6]. In the case of second trimester, at this stage, if the gestational age is not determined within the first trimester ;alternate sonographic techniques needs be used to estimate the gestational age.Gestational age assessment by ultrasonography in the second and third trimester based on composite fetal biometric parameters like Biparietal Diameter (BPD), Head Circumference (HC), Abdominal Circumference (AC) & Femur Length (FL) have accuracy of ±14 days and ±21 days respectively. This technique mainly includes transabdominal approach[5].

BPD is used to assess gestational age between 15-25 weeks and is considered equivalent to CRL for assessing gestational age .In case of the Biparietal diameter, this parameter is limited after 22 weeks' of gestation due to normal biologic development with variations in fetal size and shape. If there is a physiologic or pathologic cause for the skull size and shape to be altered, the BPD may produce false measurements[7]. Head Circumference is also a biometric parameter, which is considered as a good estimator of the gestational age. Measurement of Head circumference is more dependable between 13-25weeks the discrepancy with its use is smaller when compared to that of Biparietal diameter. . This parameter is better

than BPD to estimate the Gestational Age in the presence of any fetal skull variations[8].

Furthermore, Femur length is most dependable between 13-25week .Femur bone can be seen on an ultrasound at 10wks.. Average femur lengths may differ among certain ethnic groups. Femur Length may get affected in conditions like long bones, achondroplasia[8]. Abdominal circumference is considered to be less reliable parameter to estimate the gestational age than the other described techniques accurately. Abdominal circumference has a wide margin of error because it includes multiple factors such as asymmetry of the abdomen, changes with respiration and movement, and user skills. It also gets affected in case of IUGR. Although, it is useful in foetuses with cranial or limb abnormalities[9]. Owing to the inaccuracies of the available modalities in estimating the Gestational Age and due to rising rates of illiteracy and consanguineous marriages in India, there are increased chances of FGR and congenital malformations; hence, there is a need for a newer alternative to assess the Gestational Age accurately with advancing Gestational Age. However, Transverse cerebellar diameter (TCD) estimation is exceptionally precise in right evaluation of GA in conditions in which LMP cannot be remembered.[10]. It is imperative to recognize limitation in fetal development antenatally in light of the fact that it is related with expanded perinatal morbidity and mortality. Cerebellum can be visualised as early as 10 weeks' on ultrasound[11]. Transverse cerebellar (TCD) increases with progressing GA . In cases of uncertainty of the date of LMP, TCD acts as an accurate marker for the gestational age. Cerebellum is not subjected to deformation due to extrinsic pressure as it is protected by the dense petrous bones, occipital bone. Cerebellum remains unaffected in IUGR and appearance of

cerebellum is important in congenital malformation of cerebellum, hence it's becoming a reliable marker.

Postnatal Techniques

This technique is mainly implemented by using Dubowtiz model, New Ballard Score. Dubowtiz model is considered as a historical standard method to determine the postnatal gestational age based on 34 physical and neurologic assessments. The complete assessment mainly classified into 6 categories such as tone, tone patterns, reflexes, movements, abnormal signs, and behaviours. As a result, the score is assigned on the basis of detailed illustration sheet in which high score correlates' with the greater maturity[12]. On the other hand, to make on New Ballard Score, it is known as improved scoring system which is used to determine postnatal gestational age in infants as preterm as 20 weeks. The system is divided into 6 physical maturity components and six neuromuscular components. The physical maturity components include skin, lanugo, plantar creases, breast, ear/eye, and genitals. The neuromuscular components include posture, square window/wrist, arm recoil, popliteal angle, scarf sign, and heel to ear. Detailed illustrations have been created to assist the examiner in determining appropriate scores which correlate with gestational age. This exam is quicker to perform and may be more tolerable for sicker infants.

AIMS AND OBJECTIVES

The main aim of the study is to estimate the correlation between the foetal Transcerebellar diameter and gestational age in the second and third trimester of pregnancy. In addition to this, other objectives are as follows:

- Primary Objective: To Find Correlation between the Transcerebellar Diameter and Gestational age in 2^{nd} and 3^{rd} Trimester.

- Secondary Objective: To compare the accuracy of TCD to predict GA against the routine parameters like Biparietal Diameter, Head Circumference, Femur Length, Abdominal Circumference individually and combination of all four parameters together (BPD, HC, AC, FL) in second and third trimester.

REVIEW OF LITERATURE

Introduction of the Chapter

Sonographic Imaging

Spellanizine in 1794 on bats. Langria of France was first one who utilized ultrasound for detection and destruction of submarines during First World War in 1915.SONAR Sound - Navigation and ranging was the name given to it[14].Rightly called "Father of Modern Ultrasound", Sir Professor Ian Donald of Glasgow (1960) was the one who introduced the above technique with modifications in field of medicine.

As ultrasound passes best through fluid medium he was the one who stressed upon full bladder technique. As the fetus is surrounded by water all the time it is an appropriate subject for sonographic investigation for assessing gestational age ultrasongraphy. The assessment of fetal gestational age by ultrasonography was developed in nineteen fifties.Foetal biparietal diameter was first reported on ultrasonography by Donald the Brown (1961)[15].

A scan and B scan techniques were developed by Stuart Campbell (1968). Unidimensional AScan and Plan Position Indication (PPI) or B scan was introduced by Donald and Adbulla (1967) and Willocks et.al (1967).

The Details of the microstructure of cerebellar system was extensively worked upon by Altman (1972) and Altman and Bayer (1978) in seventies[16]. Angaut and Brodal (1967), Brown(1949), Burne et.al. (1978), Colin (1980) and others parallely studied the cerebellum which gave deeper knowledge about the cerebella cells, circuits and networks.

The process of Fetal growth is quite dynamic in nature[17]. Depending only on the available parameters with their own limitations could be erroneous in assessing the GA. For assessing GA the parameters used are CRL, BPD, HC, AC, FL .However, transcerebellar diameter (TCD) is the focus of thepresent review as it offered various advantages over other basic parametersespecially in the second and third trimester of pregnancy[18].We will discuss importance of each of the above parameters in relation to estimation of gestational age.

The sac diameter could be used via transvaginal ultrasonography at 4wk and 4 days of GA. The overall accuracy of this method is near to one week. Further, crown rump length is another method utilized to estimate GA but its accuracy is best when performed between 7^{th} and 11^{th} week of intrauterine life. Moreover, between 15^{th} and 25^{th} weeks menstrual age BPD is the method of choice for estimation of GA as its accuracy is reported best at this menstrual age. In the same time period, head circumference has also shown good accuracy in comparison to BPD.

TCD (Transcerebellar diameter) has shown exceptional accuracy in the recent past for estimation of GA in second and third trimester of pregnancy[19-20]. There was association between GA and TCD with, accuracy of 98.7%±5days in 2^{nd} and 3^{rd} trimester[21]

TCD was accurate with 92% in comparison to that of FL, BPD in another study[22].

Feotal Biometry

Fetal biometry is peformed for timely management ofIntrauterine growth restriction (IUGR) pregnancies (if any) as it helps to determine gestational age of fetus[23]. The conventional foetal biometry parameters include BPD, HC, AC, FL and these entire parameters help obstetrician in assessment of fetal maturity. The exact

information about fetal maturity or gestational age helps obstetrician to take crucial decisions of prolonging or discontinuing the pregnancy. In fetal biometery, ultrasonography made it possible to estimate gestational age and other major congenital anomalies for proper treatment planning. Biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC) and Femur length (FL) for accurate estimate of gestational age[24-25]. However, these parameters are variable in nature as they go on increasing with increasing gestational age[26-27] . So, this imparts limitation on each of the above basic parameter for the assessment of GA.

Biparietal diameter (BPD) is usually measured in the first and second trimester of pregnancy as ultrasonography results gets diluted in accuracy when pregnancy advances. So, most of these indices of fetal biometery are measured in first to second trimester only. Abnormalities in fetal head shape may dilute use of BPD.Further, head circumference (HC) analyses is better parameter in comparison to BPD in terms of variability in accuracy in second or third trimester of pregnancy[28-29].

Femur length (FL) measurement by ultrasonography helps in detection of short- limbed dysplasias in fetus in addition to gestational age[30]. As far as accuracy is concerned, it offers best estimates of GA between 13 and 25 weeks gestation[31]. Moreover, in comparison to BPD some reports have reported FL as better parameter while some reports have suggested it equivalent to BPD[32]. On the other hand, abdominal circumference (AC) earliest to get affected in FGR ,which is an significant cause for fetal compromise[33]. Further, AC assessment is usually performed in third trimester of pregnancy but latest reports confirm better accuracy at 1 week prior to delivery[34]. Overall, all these basic foetal biometry parameters decline in accuracy with advancement in gestational age.

Estimation of Transcerebellar Diameter

The transcerebral diameter (TCD) is a important new modality to assess the GA as well as development of brain. [35]. Cerebellum is the biggest portion of hind brain and starts forming at end of 5 wks. [36]. Many earlier reports have confirmed its accuracy over BPD in the events of abnormalities in the shape of skull[37-38]. TCD is measured by utilizing electronic calipers at cerebellum outer margins. TCD measurement allows assesment of thalami, cavum, spetumpellucidum and third ventricle by rotating the transducer below thalamic plane[39]. Moreover, TCD is also apt and superior in estimation of gestational age of singleton and twin gestation[40]. Moreover, accuracy of TCD is not affected by abonormalities in the fetal head shapes. "Furthermore 14^{th}-$20^{th\ wk}$ TCD (mm) will equal GA in wks".Further, after 20 weeks TCD measurement exceed gestional age in weeks. So, the best time period for performing TCD is between 14^{th} and 20^{th} gestation or in between second and third trimester of preganancy. A recent study confirmed a linear relationship between TCD and GA in the second trimester of pregnancy[41]. Between 14- 32 weeks gestation Smith et al established method to measure anteroposterior and transverse diameter of the cerebellumwith TCD and GA correlating well.[42]. In a study done by Reece et al between 13-40week on 371 women, between Gestational age, BPD, HC and TCD there was curvilinear relationship noted[43]. There was linear relationship between TCD and GA done in a research by Hata T, Hata K(1989) on 116 women between 17-40weeks.they concluded that TCD was more reliable parameter for calculating gestational age in conditions like brachycephaly, dolicocephaly[44].A study done by Chavez MR et al concluded that TCD is dependendable modality for assessing GA in 3^{rd} trimester also(r-0.92, $p < 0.0001$)[45]

Large for gestation and Growth restriction &Transcerebellar Diameter

Importance of Transcerebellar diameter in large for gestational age foetuses was studied by Hill, Fries et al. (1990) over estimations in head circumference and abdominal circumference measurements in calculation of gestational age were obtained but not with transcerebellar diameter[46].

Transcerebellar diameter were easy to obtain than other biometric parameters in occipitoposterior position was found by Montenogro, Leite (1989)[47]

TCD measurement is also helpful in assesment of suspected intrauterine growth retardation (FGR) in fetus[48]. Also, TCD measurement remained unaffected by fetal growth retardation when compared to other conventional ultrasonography parameters making it a versatile as well as accurate method of gestational age estimation. Moreover, TCD is not influenced by alterations in the fetal growth such as macrosomia[49]. TCD offers another advantage over other USG parameters that its measurement is very simple and accurate. Moreover, a recent study compared accuracy of other routine parameter with TCD in estimation of gestational age and concluded TCD as superior method over other routine parameters. . So, all these inferences from earlier reports make TCD a versatile parameter for estimation of fetal gestational age compared to other routine parameters .In study done on 200 pregnant women between 15-40week showed strong relation between TCD and GA (r-0.984)in spite not being the actual predictor for FGR TCD can be used for prediction of FGR.

A study conducted by William Meyer et al to see for reliability TCD/AC ratio as age independent marker to assess abnormal growth concluded that TCD/AC ratio is apt for picking up small for gestation but not for larger for gestation[50].

167 pregnant women who were suspected to have FGR were studied. 51.5% was prevalence of FGR in the study population. The sensitivity, specificity, PPV, NPV was 73.2%, 80.25%, 79.7 %,73.8% .The TCD/AC ratio was estimated, the cut off which was obtained to be 15.4%. The study showed that TCD/AC was a age-independent parameter which can be used to pick up FGR even when gestational age was unsure[51]

Transcerebellar diameter and posterior cranial fossa lesions

The presence of myelodysplasia, Arnold-Chiari malformation and Dandy-Walker cyst was considered as failure for proper cerebellar development. Posterior cranial fossa lesions were worked upon by Dandy and Blackfan (1914). Dempsey and Koch (1981) gave insights on in- utero diagnosis of Dandy - Walker Syndrome. Correlation of correlated the ultrasound images of posterior cranial fossa with gross and myelin-stained sections of human brain was done by Yousefzadeh and Naidich (1985)

Demonstration the anatomy of foetal posterior cranial fossa for different gestational ages varying from 15-40 weeks by ultrasound was examined by Pilu, Romero, Jeanty, Burdine and Hobbins (1987)[52]

The possibility of benign, isolated large fourth ventricle was demonstrated by Bronshtein et.al (1998)[53]

Transcerebellar diameter and multiple gestation.

The study done by Shimizu et. al (1992) showed no significant difference in transcerebellar diameter in twin pregnancies.[54]

(a) Between normal singleton and twin gestations

(b) Between each pair

(c) Not influenced by Chorionicity or discordancy

(d) The normogram developed for singleton pregnancy had good correlation for twins

Goldstein et. al (1995) compared growth of cerebellum in normal and growth restrictrd fetus and concluded that there was retainment of normal growth in IUGR foetuses , similar growth rate observed in single/multiple gestation.[55]

Grading Of Cerebellum

Changes in Cerebellum with advancement of gestational age were studied by Kazumasa Hashimoto et al on 291 fetus between 14-41wk[56-63]

GRADE 1 (upto 27 wks)

1. Each Cerebellum is round in shape
2. Vermis is not well developed hence Both cerebellar hemispheres look like pair of eye glasses
3. Lack of echogenecity of hemispheres

Grade II (28 – 32 wks)

1. Echogenic rectangular tissue which connects the two hemispheres is vermis which is seen more clearly which changes whole look of cerebellum to dumble shape

2. Now each hemisphere is oval in shape , the peduncles are less echogenic when compared to central echogenic portion that is the vermis giving internal zone ground glass appearance

Grade III (after 32 wk)

1. The hemisphere appear fan shaped
2. There similar echogenicity for tissue in central portion of hemisphere with that of margin making cerebellum look more solid tissue than cystic look

Figure 1: Grade I Cerebellum

Figure 2: Grade II Cerebellum

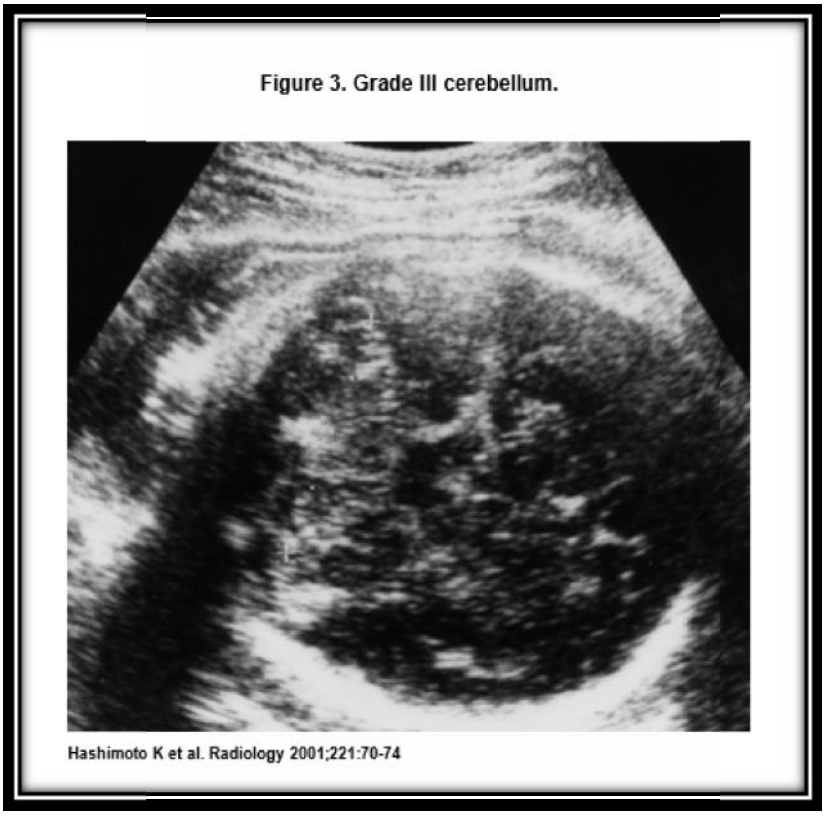


Figure 3: Grade III Cerebellum

Transcerebellar diameter in Ethnic groups

A study conducted at anttwerp university hospital in Belgium on 471 singelton fetuses, including 333 belgian, 69 moroccon and 69 turkish concluded that TCD not dependent on ethnicity.

METHODOLOGY

The present study was conducted in department of obstetrics and gynecology, KAHER's Dr. Prabhakar Kore Charitable Hospital, Belagavi

Study design

The study was prospective observational study

Study period

The study was conducted during the period from 1st January 2017 to 31st December 2017.

Source of data

All antenatal women attending the OPD between 26 weeks to 36 weeks who met the inclusion criteria and who were willing to participate were enrolled in study.

Sample size- 500 pregnant women were included in study

Calculated using the formula

$$n = \frac{\left[Z_{1-\beta} + Z_{1-\alpha}\right]}{\left[FZ(P_1) - FZ(P_0)\right]^2} + 3$$

$$FZ(P_1) = \frac{1}{2} \ln\left[\frac{1+P_1}{1-P_1}\right] \qquad FZ(P_0) = \frac{1}{2} \ln\left[\frac{1+P_0}{1-P_0}\right]$$

Where,
P_0 : Population correlation coefficient
P_1 : Sample correlation coefficient
α : Significance level
1-β : Power

For minimum sample of 50 (sample size in previous articles) at 85% CI and 15% standard error by using the formula 14 is required minimal sample size.

SELECTION CRITERIA

Inclusion Criteria-

- Singleton pregnancy
- Women with dating scan (between 6wk to 13 6/7 weeks)
- The gestational age should be between 26weeks-36weeks.

Exclusion Criteria-

- Complication of pregnancy like preeclampsia/ Eclampsia,
- Gestational hypertension
- Overt/ Gestational diabetes mellitus
- IUGR
- Macrosomia
- Multiple pregnancies
- Major fetal congenital anomalies

Ethical Clearance

Ethical clearance obtained from JNMC ethical research committee prior to the commencement of study. (Annexure-3)

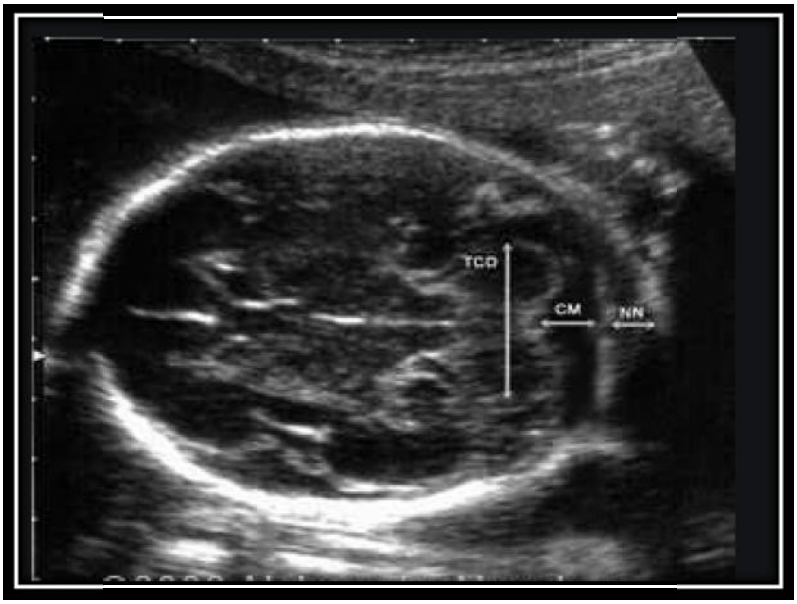
Informed Consent

All participants who fulfilled the selection criteria were explained in their own vernacular language the purpososse of study and written informed consent was taken before enrollement in the study.(consent form in three different languages)

Method of Collection

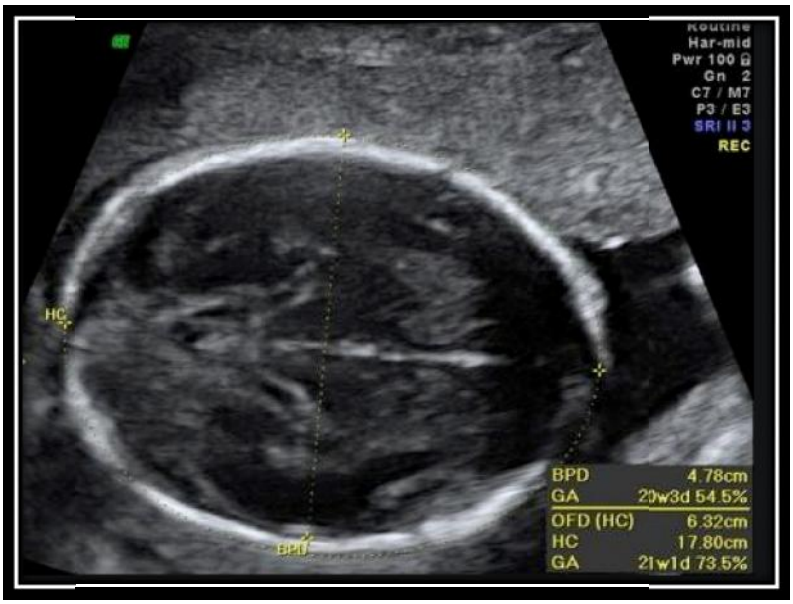
- All pregnant women who fulfilled the inclusion criteria and consented were enrolled
- Ultrasound machines used were
    - Philips HD11
    - Voluson S8
- All examinations were performed using curvilinear array real time B scanner with a 3.5 Mhz transducer.
- 4 sonographers performed transcerebellar diameter measurements were trained by ISUOG
- With other biometric parameters taken like Biparietal diameter, Head circumference, Abdominal circumference, Femur length, Transcerebellar diameter was measured.

Image 1: Transcerebellar Diameter



- Transcerebellar diameter between 26-36weeks was measured by inserting the electronic calipers on outer cerebellar margins. Thalamus, cavumseptum pellucidum and 3RD ventricle were the notable landmarks.The Posterior Fossa was identified by dumbbell shaped like appearance of cerebellum, which was seen as two lobes on each side of centre of posterior Fossa. TCD was measured from the outer margin of one cerebellar hemisphere to the outer margin of the other cerebellar hemisphere, including both the hemispheres and the vermis.

Image 2: Biparietal Diameter



- **Biparietal Diameter**
  - Plane is cross sectional view at level of thalami
  - Falxcerebri interrupted in between by cavum septum pellucidi and thalamus
  - Cerebellum not visualized
  - Measurement taken from outer edge of cranium closer to transuducer to inner edge of cranium farther from transducer.

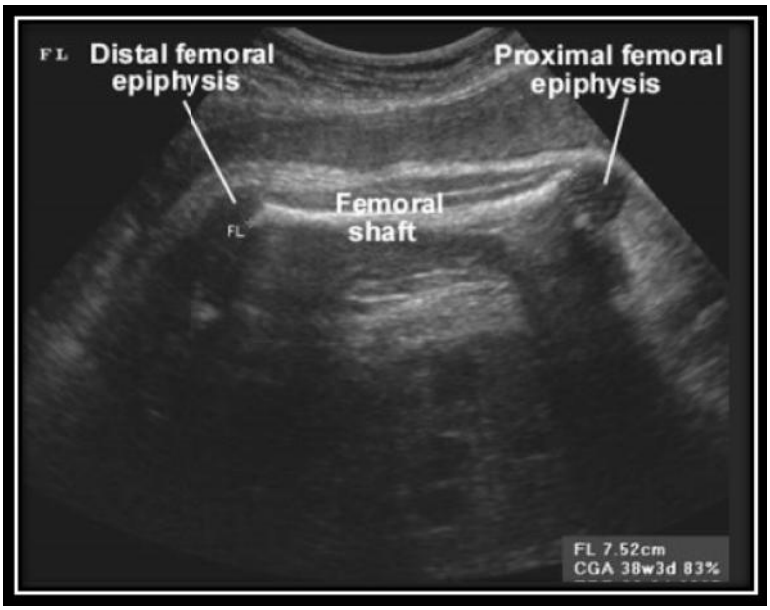
Image 3: Head Circumfarence

- **Head circumference**
  - The measurement was taken in same plane as for BPD, it is measured by keeping ellipse around the outside of skull bone echo.

Image 4: Abdominal Circumfarence

- **Abdominal circumference**
  - It transverse section of fetal abdomen, it should be as circular.
  - It is taken at level of intrahepatic segment of portal vein and stomach bubble.

Image 5: Femur Length



- **Femur length**
  - Measured by placing each calliper at end of ossified diaphysis excluding distal femoral epiphysis if visible.

The GA by biometry (all other four parameters) was calculated by Hadlock formula.

Statistical Analysis

The data sheet created by Microsoft Excel worksheet. The statistical significance of the data has been determined using SPSS software version 25. Karl Pearsons Coefficient, linear regression, multiple regression and combination of both methods were used for data analyses.

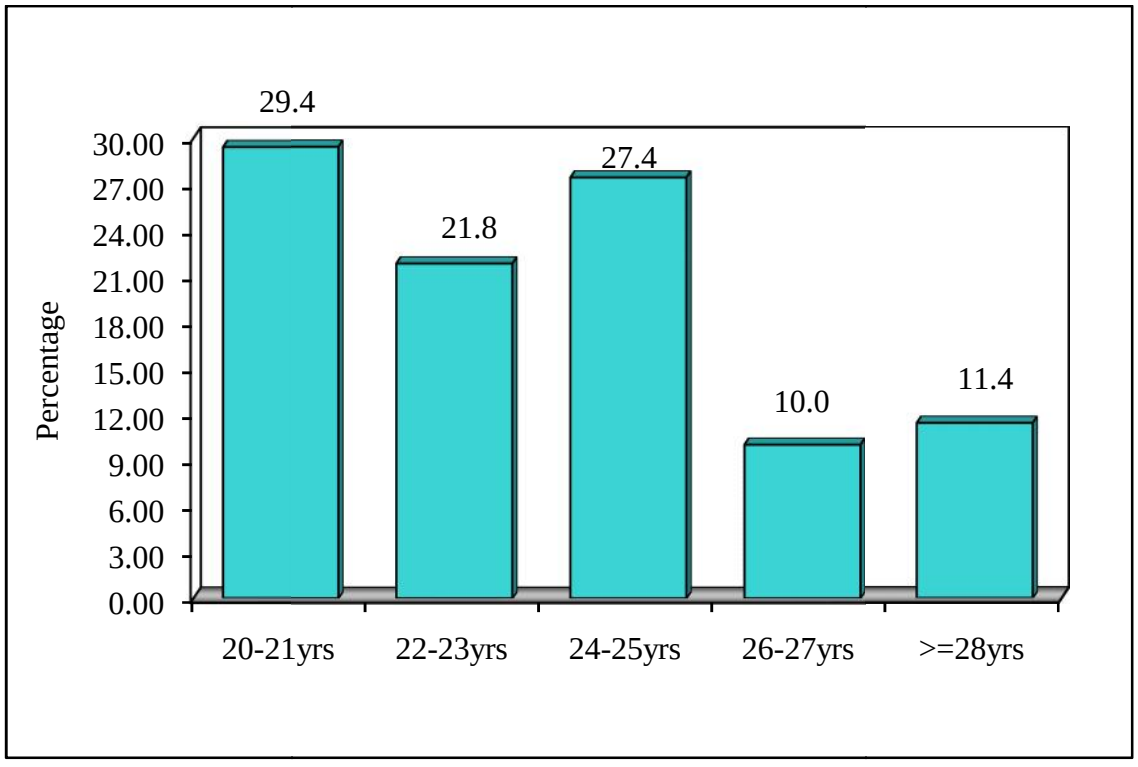
This data was further used to formulate normograms at 5^{th}, 50^{th}, 90th percentiles.

RESULTS

Table1 : Distribution of Participants by Age Groups

Age groups	No of participants	% of participants
20-21yrs	147	29.4
22-23yrs	109	21.8
24-25yrs	137	27.4
26-27yrs	50	10
>=28yrs	57	11.4
Total	500	100.00
Mean	23.75	
SD	2.67	

Figure 2: Distribution of Participants by Age

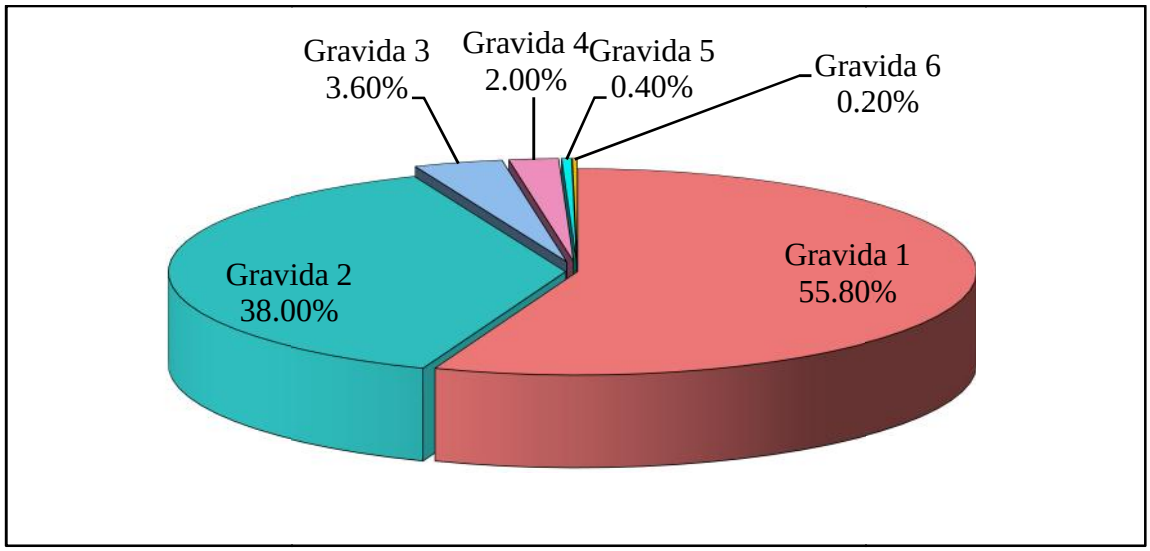


The Figure and Table 1 show the distribution of all the 500 participants according to age. Out of 500 participants, 147 participants who accounted to 29.4% of the total were between 20 -21 yrs of age. 109 participants who accounted to 21.8% of the total were between 22-23 yrs of age. 137 participants who accounted to 27.4% of the total were between 24-25 yrs of age. 50 participants who accounted to 10% of the total were between 26-27yrs of age and 57 participants who accounted to 11.4% of the total were above 28 yrs of age.The mean age in our study was 23.75±2.67yrs

Table2: Distribution of Participants by Status of Gravida

Gravida	No of participants	% of participants
Gravida 1	279	55.8
Gravida 2	190	38
Gravida 3	18	3.6
Gravida 4	10	2
Gravida 5	02	0.4
Gravida 6	01	0.2
Total	500	100

Figure 2: Distribution of Participants according to Status of Gravida

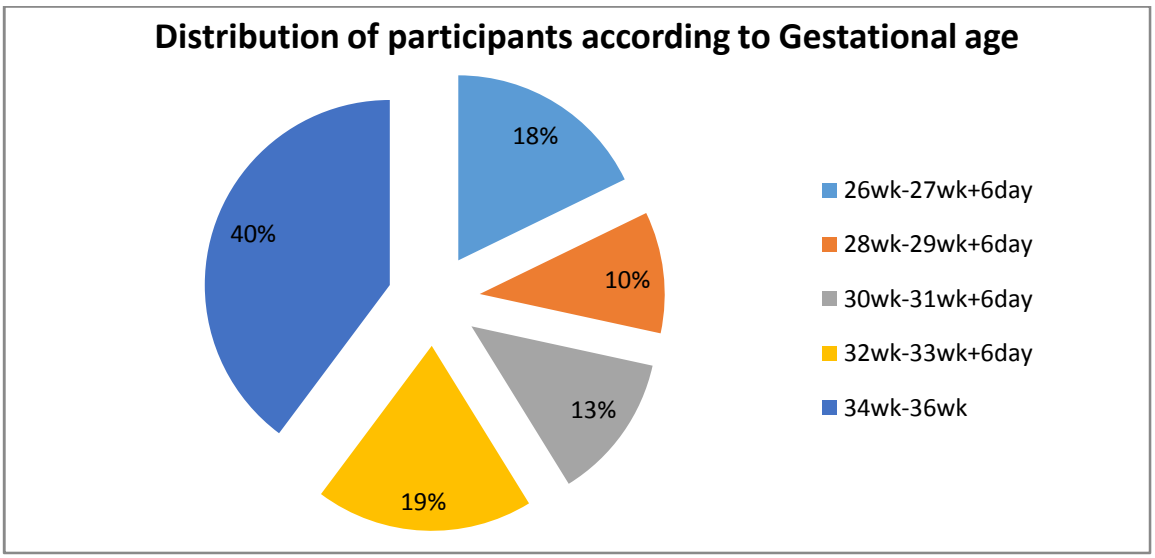


The Table and Figure 2 describe the distribution of all the 500 participants according to Gravida. Out of 500 participants, 279 participants who accounted to 55.8% of the total were Gravida 1. 190 participants who accounted to 38% of the total were Gravida 2. 18 participants who accounted to 3.6% of the total were Gravida 3. 10 participants who accounted to 2% of the total were Gravida 4. 2 participants who accounted to 0.4% of the total were Gravida 5 and 1 participant who accounted to 0.2% of the total was Gravida 6.

Table3: Distribution of Participants According to Gestational Age

Gestational age in groups	No of participants	% participants
26wk- 27 6/7 weeks	89	17.8%
28wk- 29 6/7 weeks	53	10.6%
30wk-31 6/7 weeks	64	12.8%
32wk-33 6/7 weeks	95	19%
34wks-36wks	199	39.8%
Total	500	100

Figure 3: Distribution of Participants According to Gestational Age



The Table and Figure 3 describe the distribution of all the 500 participants according to the Gestational Age. Out of 500 participants, 89 participants who accounted to 18% of the total were between 26 – 27 6/7 weeks of gestation. 53 participants who accounted to 10.6% of the total were between 28 – 29 6/7 weeks ofgestation . 64 participants who accounted to 12.8% of the total were between 30 – 31 6/7 weeks of gestation. 95 Participants between 32 weeks to 33 6/7 weeks. Between.34-36 weeks there were 199 participants which accounted to 39.8% which is majority of total.

Table 4: Mean Gestational Age With Standard Deviation

Gestational Age (Weeks)	TCD (mm) Mean ± SD	Frequency (n)	Percentage	Cumulative Percentage
26	29.163 ± 2.9439	60	12	12
27	30.462 ± 2.6347	29	5.8	17.8
28	32.093 ± 2.4521	29	5.8	23.6
29	34.721 ± 3.9983	24	4.8	28.4
30	34.500 ± 4.7783	27	5.4	33.8
31	35.362 ± 3.7020	37	7.4	41.2
32	35.891 ± 2.8347	44	8.8	50
33	36.386 ± 3.4420	51	10.2	60.2
34	37.057 ± 3.3837	81	16.2	76.4
35	38.040 ± 2.8882	96	19.2	95.6
36	40.100 ± 4.9437	22	4.4	100

The Table 4 shows the Mean gestational age with SD for respective gestational age, with frequency distribution in each group with contribution of each gestational age in percentage and cumulative frequency are shown in above table.

Table 5: Correlation between Gestational age with Biparietal diameter, Head circumference, Abdominal circumference, Femur length, and Transcerebellar diameter by Karl Pearson's correlation coefficient method

Parameters	Correlation between Gestational age with		
	r-value	t-value	p-value
Biparietal diameter	0.8308	29.7774	<0.001
Head circumference	0.8205	28.6352	<0.001
Abdominal circumference	0.8487	32.0117	<0.001
Femur length	0.8580	33.3192	<0.001
Transcerebellar diameter	0.9160	22.4484	<0.001

In the Table 5 Gestational Age from all the individual parameters like Biparietal Diameter, Head Circumference, Abdominal Circumference, Femur Length and Transcerebellar Diameter was correlated with the actual Gestational Age using Karl Pearson's Correlation Coefficient Method. As the p-value of all the parameters is less than 0.001, it indicated strong correlation between individual parameters with GAi.e there was a significant correlation between TCD and GA (r =0.9160. P<0.001).also FL, AC, BPD, HC showed good correlation with GA (r) respectively. TCD correlated with gestational age better than remaining four parameters. So, it is derived from all the above analysis that TCD with GA has thick correlation (highest standard) with 95% Confidence interval.

Figure 4: Correlation between Gestational Age and Biparietal diameter

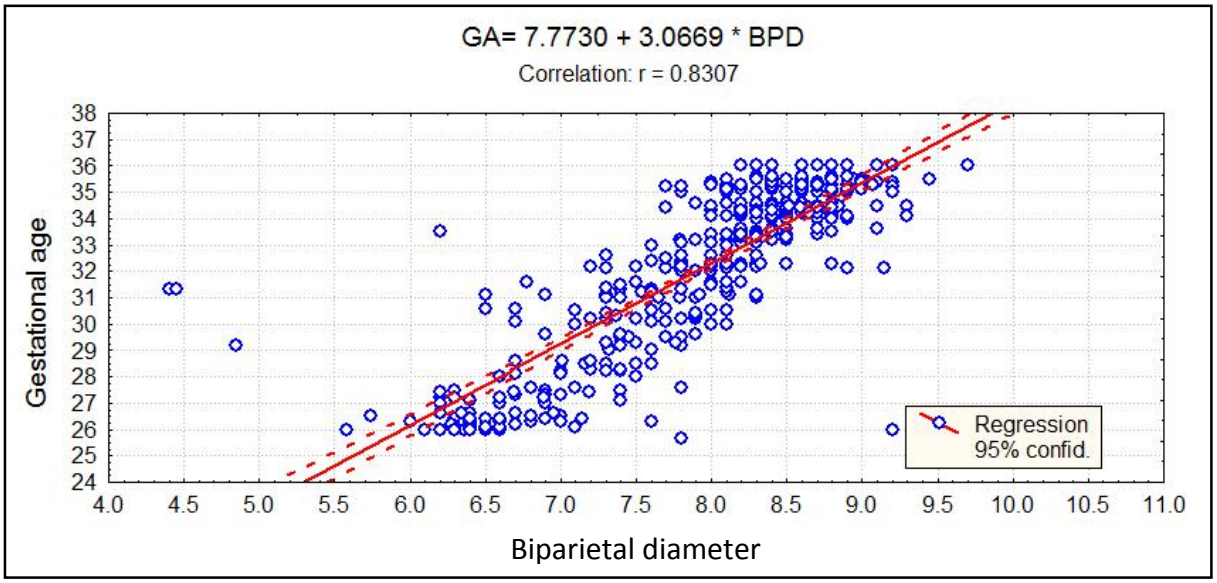


Figure 5: Correlation between Gestational age and Head Circumference

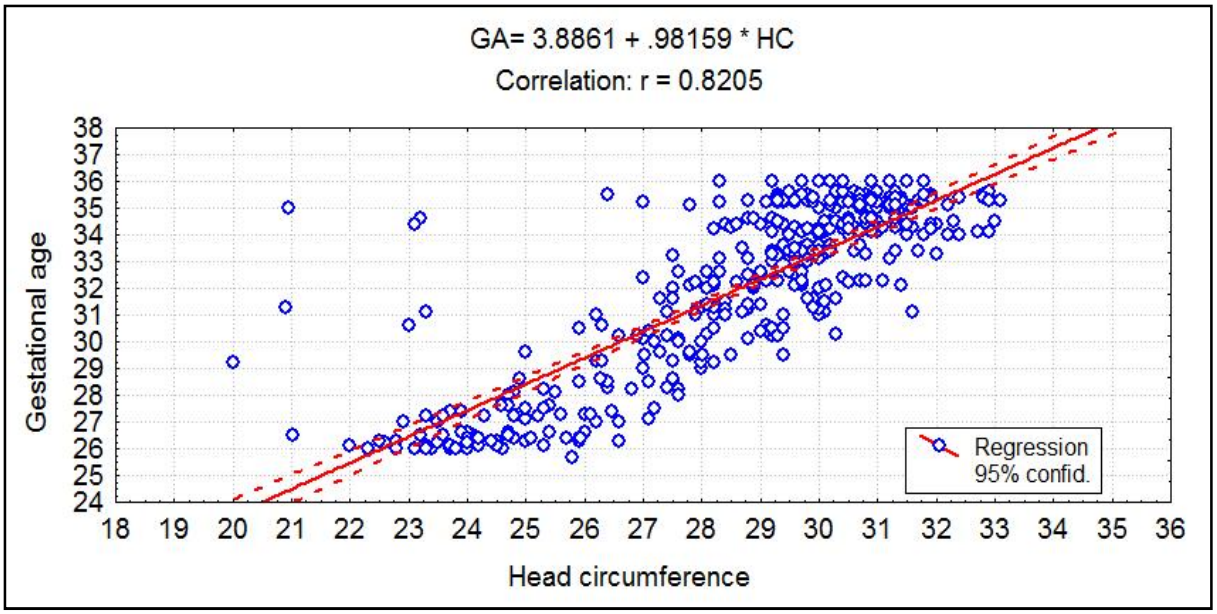


Figure 6: Correlation between Gestational age and Abdominal circumference

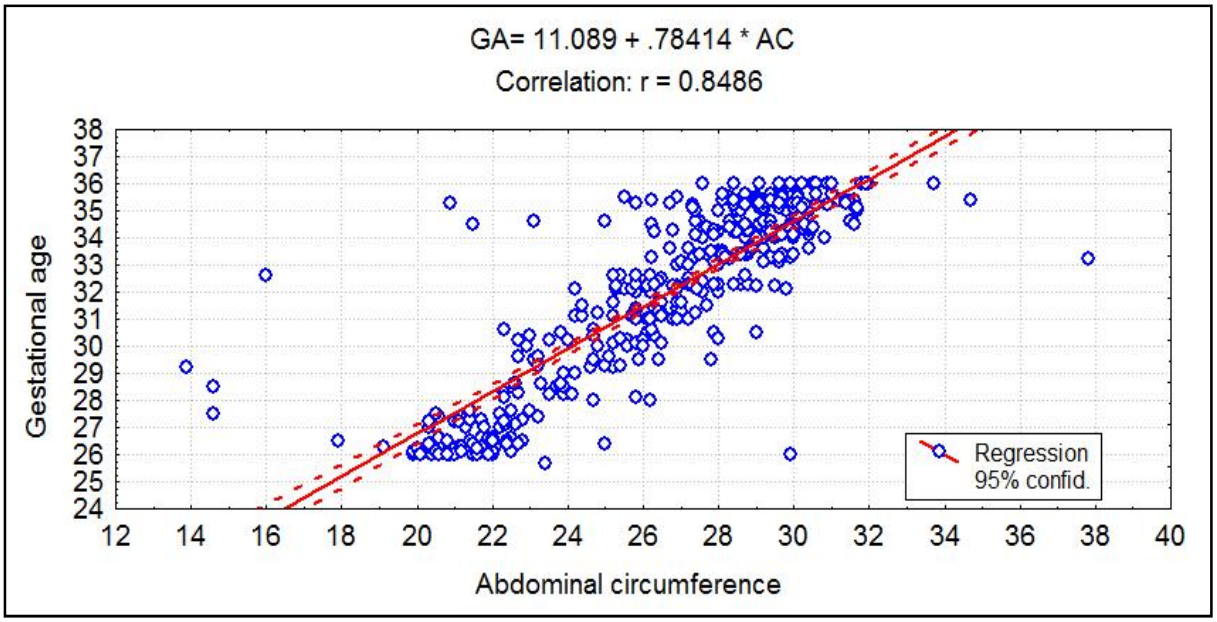


Figure 7: Correlation between Gestational age and Femur length

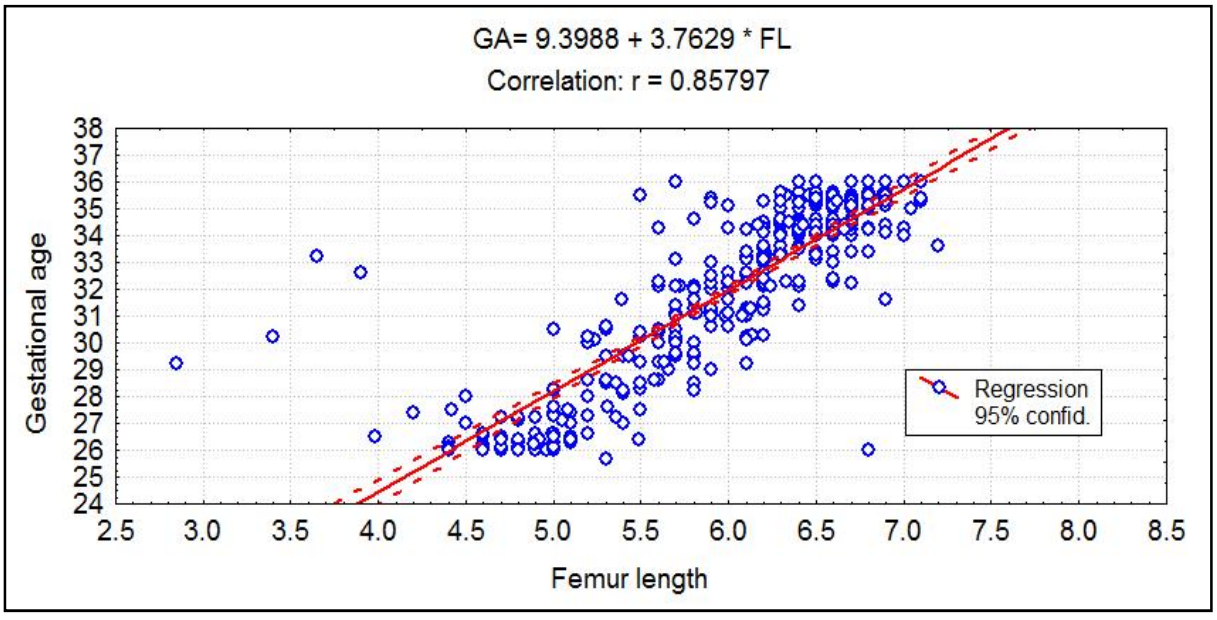


Figure 8: Correlation between Gestational age and Transcerebellar diameter

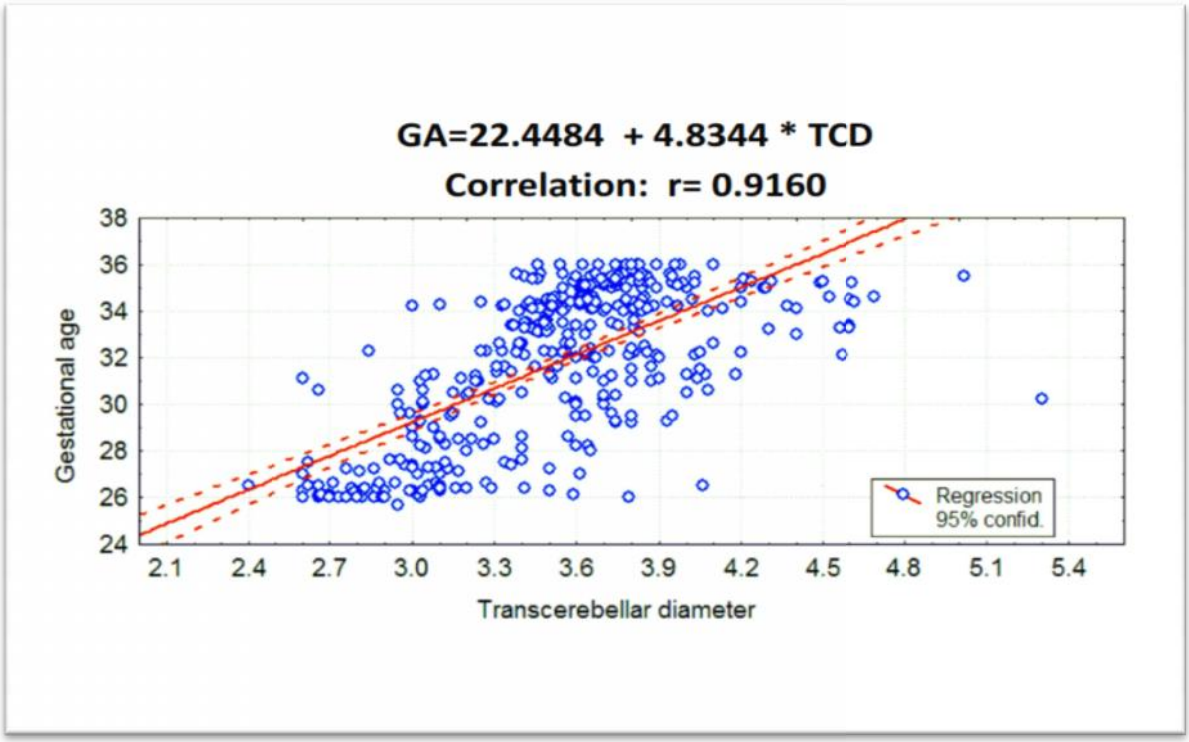


Table 6: Correlation between Gestational age with Biparietal diameter, Head circumference, Abdominal circumference, Femur length, and Transcerebellar diameterby 2 tail significance with Pearsons correlation.

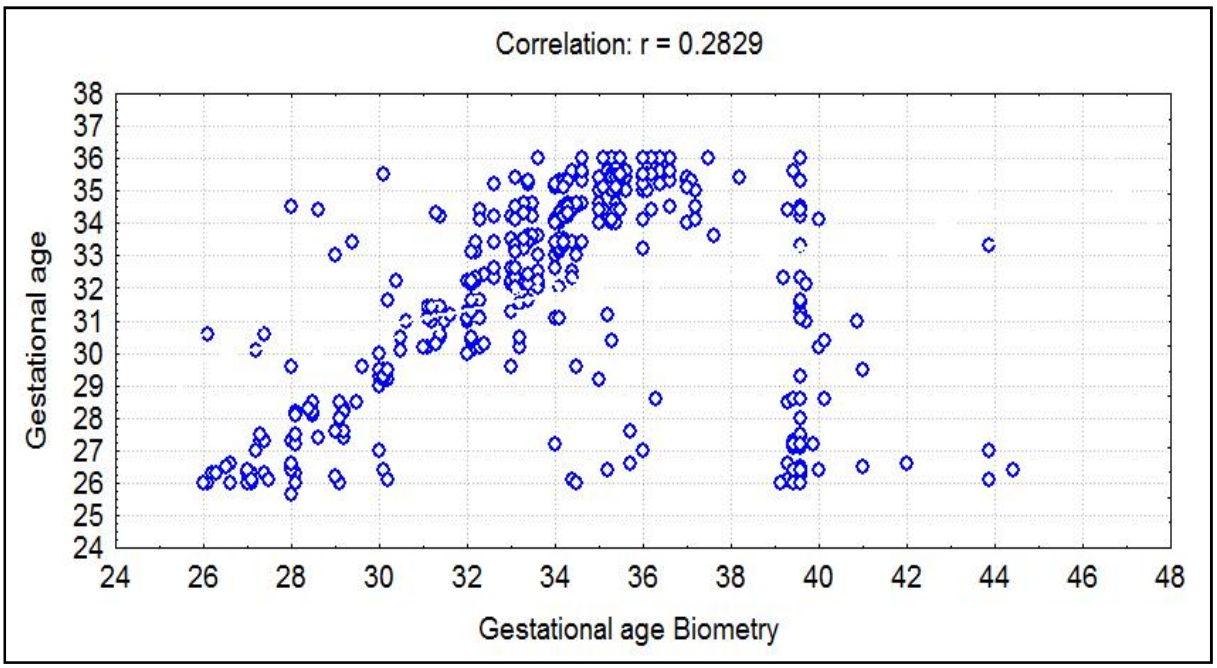
		Gestational age	Biparietal diameter	Head circumference	Abdominal circumference	Femur length	Transcerebellar diameter
Gestational age	Pearson Correlation	1	.204	.181	.130	.238	.645
	Sig. (2-tailed)		.000	.000	.004	.000	.000
Biperietal diameter	Pearson Correlation	.204	1	.048	.023	.050	.145
	Sig. (2-tailed)	.000		.289	.607	.261	.001
Head circumference	Pearson Correlation	.181	.048	1	.032	.035	.143
	Sig. (2-tailed)	.000	.289		.477	.437	.001
Abdominal circumference	Pearson Correlation	.130	.023	.032	1	.035	.100
	Sig. (2-tailed)	.004	.607	.477		.436	.025
Femur length	Pearson Correlation	.238	.050	.035	.035	1	.274
	Sig. (2-tailed)	.000	.261	.437	.436		.000
Transcerebellar diameter	Pearson Correlation	.645	.145	.143	.100	.274	1
	Sig. (2-tailed)	.000	.001	.001	.025	.000	
a. Listwise N=500							

The Table 6 shows predicted normal range and centiles for TCD with 2-tail significance with Pearson's correlation. There was a significant correlation constructed between TCD and Gestational age (2-tail sign pearson's correlation=0.645).There was stronger association between TCD and gestational age when compared with other parameter.

Table 7: Correlation between Gestational age with GA Biometry(composite of BPD,HC,FL,AC) by Karl Pearson's correlation coefficient method

Parameters	Correlation between Gestational age with		
	r-value	t-value	p-value
GA Biometry	0.2819	5.8837	<0.001

Figure 9: Correlation between Gestational age and Gestational Age Biometry



The table 7 and Figure 9 describes, the Gestational Age from Biometry was correlated with the actual Gestational Age using Karl Pearson's Correlation Coefficient Method. As the p-value of Gestational Age by Biometry is less than 0.001, it indicates that the Gestational Age from Biometry has statistical significant Correlation with the actual Gestation Age.

T**able 8: Multiple Linear Regression Analysis of Gestational Age by Other Variables**

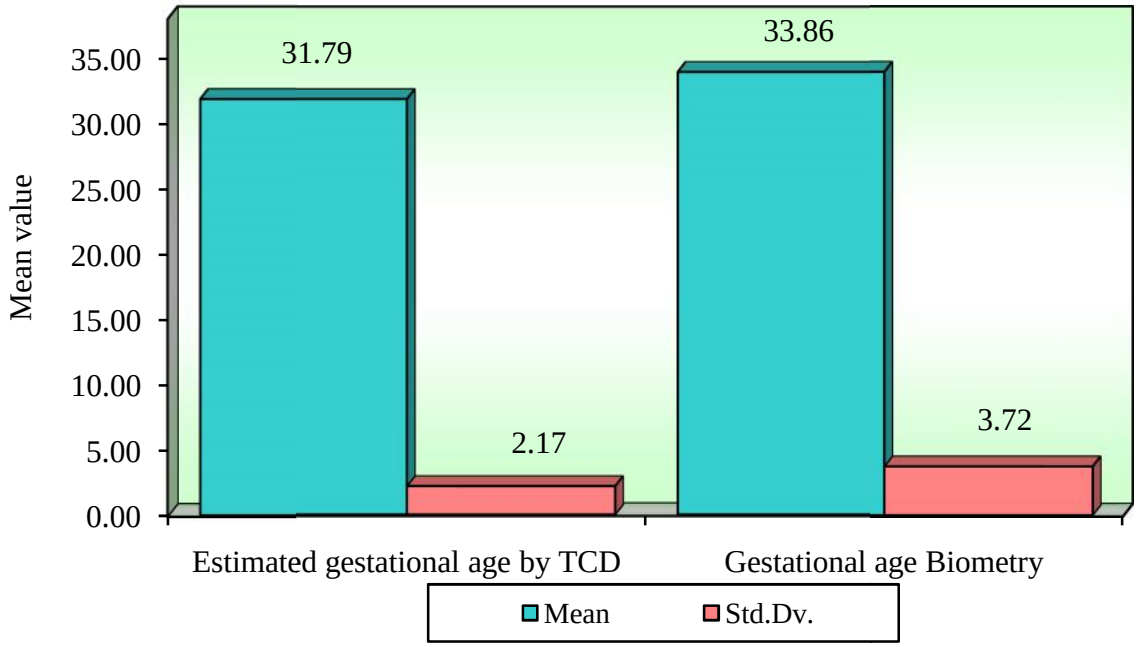
Independent variables	Estimates	SE of estimate	t Stat	P-value	95% CI for estimates	
					Lower 95%	Upper 95%
Intercept	4.5100	0.7094	6.3575	<0.001	3.1153	5.9047
Biparietal diameter	0.6101	0.1608	3.7935	<0.001	0.2939	0.9263
Head circumference	0.0582	0.0536	1.0857	0.2783	-0.0472	0.1635
Abdominal circumference	0.2571	0.0369	6.9602	<0.001	0.1845	0.3297
Transcerebellar diameter	1.5669	0.1743	8.9913	<0.001	1.2243	1.9095
Femur Length	1.3439	0.1856	7.2411	<0.001	0.9790	1.7087
$R=0.9182$, $R^2=0.8431$, $F(5,399)= 423.6475$ $p<0.001$, S, Std.Error of estimate: 1.2995						

The Table 8 describes Multiple Regression Analysis was done of Gestational Age by other variables in order to understand the best parameter for the estimation of the Gestational Age. According to this analysis, the t-Stat value of the Head Circumference is 1.0857, the t-Stat value of Biparietal Diameter is 3.7935, the t-Stat value of Abdominal Circumference is 6.9602, the t-Stat value of Femur Length is 7.2411 and the t-Stat value of Transcerebellar Diameter with 95% significance upper level is 8.9913. As the t-Stat value of the Transcerebellar Diameter is the highest, it indicates that it is the best parameter to estimate the Gestational Age.

Table 9: Comparison of Estimated Gestational age by TCD and Gestational age Biometry by dependent t test

Variables	Mean	Std.Dv.	Mean Diff.	SD Diff.	Paired t	p-value
Estimated Gestational age by TCD	31.7854	2.1717	-2.0749	3.8025	-10.9134	<0.001
Gestational age Biometry	33.8603	3.7213				

Figure 10 :Comparison of estimated Gestational age by TCD and Gestational age Biometry

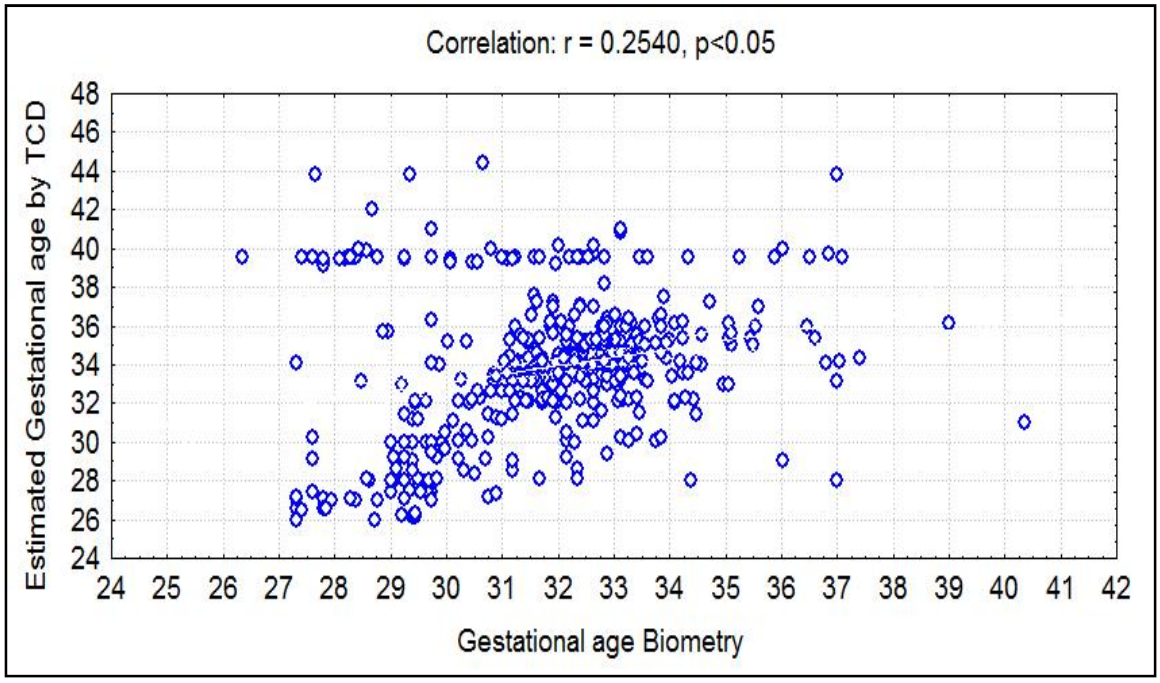


In the Table 9 and figure 10, the Gestational Age by Transcerebellar Diamterer is compared with Gestational Age by Biometry using dependent t-test. The mean for gestational age by TCD is 31.79cm when compared with GA by biometry is 33.86cm.GA by TCD Showed lesser Standard deviation of 2.17 when compared to that GA by biometry (FL, HC, BPD, AC). Lower the standard deviation means there is strong association, accurate construction with mean .SD explains the level of deviation with the standard. So lesser the standard deviation is greater association.

Table 10: Correlation between estimated Gestational Age by TCD with GA Biometry by Karl Pearson's correlation coefficient method

Parameters	Correlation between Gestational age with		
	r-value	t-value	p-value
GA Biometry	0.2540	5.2392	<0.001

Figure 11: Correlation between estimated Gestational age by TCD with Gestational age Biometry



In Table10 and figure 11 the Gestational Age by Transcerebellar Diamterer is compared with Gestational Age by Biometry using Karl Pearson's correlation coefficient method. The above test indicates that there is a statistical significant correlation between the Gestational Age by TCD and Gestational Age by Biometry as the p-value is less than 0.001.

Table 11: Normogram

Menstrual Gestational	Percentiles					
Age	5	10	25	50	75	90
26	26.10	27.35	28.79	30.00	31.60	34.35
27	28.50	28.74	30.43	31.20	32.73	33.29
28	30.10	30.44	31.10	33.20	35.10	39.30
29	30.40	30.30	33.48	35.05	37.59	40.07
30	35.05	35.17	35.60	37.53	39.55	42.48
31	37.26	37.56	38.40	38.70	40.93	42.71
32	35.10	36.32	38.70	40.00	41.05	43.44
33	40.50	40.40	41.56	42.21	43.67	44.08
34	37.10	39.74	43.05	44.40	45.90	48.46
35	44.03	44.24	45.15	45.90	49.10	50.01
36	42.60	46.10	47.10	49.34	52.15	53.04

The Normogram illustrates the TCD in measurements(mm) at 5^{th}, 10^{th}, 25^{th}, 50^{th}, 75^{th}, 90^{th} percentile for respective gestational age.

Table 12: Predictive Accuracy of TCD for Following Gestational Age.

Gestational age in weeks	Predictive Accuracy of TCD	Days of Discrepancy
26wks- 28wk+6days	99.52%	±5days
29wks-36wks	97.49%	±7days
26wk-36wks	98.51%	±6days

Table13 hereby shows that predictive accuracy of TCD between 26-28weeks is 99.52% with discrepancy of ± 5days from actual GA. Between 29-36 weeks is predictive accuracy is 97.49%with discrepancy of ±7days from actual GA and between 26weeks to 36weeks the predictive accuracy is 98.51% with discrepancy of ± 6days from actual GA.

Table 13: Predictive accuracy of BPD, HC, AC, FL

Parameters	Predictive Accuracy	Days of Discrepancy
BPD	93.8%	15
HC	91.2%	18
AC	93.2%	15
FL	94.3%	12

Predictive accuracy of TCD was 98.5% with discrepancy of ±6days from actual GA compared to FL (94.3% with discrepancy of ±12days from actual GA), BPD (93.8% with discrepancy of ± 15days from actual GA), AC (93.2% with discrepancy of ±15days from actual GA), HC (91.2% with discrepancy ±18days from actual GA)

DISCUSSION

The accuracy in assessment of gestational age is crucial for the clinicians in order to instruct complete antenatal care[64]. Moreover, this assessment also plays an important role in planning of further treatment plans including clinical tests and interventions. It is a well-known fact that foetal growth is quite dynamic in nature[65]. So, routine conventional parameters like we discussed earlier are used to assess GA[65]. The present study focuced on the transcerebellar diameter (TCD) as it has been reported earlier to have multiple advantages, especially during the second and third trimester of pregnancy[66]. We measuresed each of the above conventional parameter along with TCD in each patient. Thereafter an attempt was made to corrleated TCD with gestational age.

As it is proven that gestational age assessment is best in first trimester by using CRL. But many women may not accurately know their LMP and may not have their dating scan done. In such women estimation of gestational age is challenging.

A study by Campbell et al showed that around 45% were unsure of their last menstrual period owing to inability to remember, irregular cycles, and use of OCPs within two months of conceiving.

But reliability to accurately estimate gestational age decreases with the advancing age with parameters like BPD, AC, FL, HC owing to their own shortcomings in various situations.

Age of subjects

There were total 500 patients that met inclusion criteria for the present study. The average age of study subjects was observed to be 23.75 years. Further, 55.8 % of study subjects that is 279 participants were Primigravidas and least number of

participants were Gravida 6. Moreover, in terms of gestational age, maximum number (59.8 %) of study subjects was recorded in the gestational age group of 32-36 weeks. So, most of the patients in the present study were near third trimester of pregnancy. The prime reason for choosing this gestational age group was to find out the predictive accuracy of TCD upto third trimester of pregnancy as other conventional parameters usually fail in third trimester[67]. Moreover, there are confirmed reports that evidenced increasing variability among convntional paramters especially during later stages of pregnanancy[68-70]. In our study the measurements of TCD ranging from 24mm to 53mm the mean was 35mm. A study was conducted by Adeyekun aa et al on 450 nigerian women between 14-42 weeks with range of TCD measurements between 11.9 to 59.7mm with mean of 34.2mm.

This study involved measurement of both conventional parameters as well as TCD for estimation of gestational age. Further, correlation between gestational age with conventional parameters including Biparietal diameter, Head circumference, Abdominal circumference, Femur length, and Transcerebellar diameter (TCD) was explored using Karl Pearson's correlation coefficient method.

Correlation analysis

The prime objective of present study was to establish 'TCD' as an additional biometric parameter for estimation of gestational age of the fetus and to compare it with other conventional established fetal ultrasound biometric parameters. Correlation analyses were carried out and scatter plots of BPD and GA, HC and GA, AC and GA, FL and GA and TCD and GA were generated. All Individual 5 Parameters ($p<0.001$) showed significant correlation with Gestational Age as noticeable"r" values were recorded for each parameter. The above results are in sync

with earlier reports that confirmed the importance of conventional parameter in relation to gestational age[71-73]. We will now discuss correlation results with respect to GA for all conventional parameters as well as TCD.

Correlation of conventional parameters with gestational age (GA)

Correlation coefficient (r) between BPD and GA in our study was recorded as 0.8308 and a third order polynomial equation described the growth pattern of fetuses. This was similar to the correlation coefficient between BPD and GA found by the other researchers[74,75]. Further, HC (head circumference) revealed significant correlation coefficient values with respect to gestational age too. However, earlier reports have supported the fact that head circumference (HC) of newborns is an important tool for evaluation of intra-uterine brain development. A recent study proved the fact about HC in relation to brain development[76,77]. The observation of AC (abdominal circumference) revealed significant correlation coefficient values and the results are in sync with earlier reports[78,79]. AC measurements in relation to gestation age were also performed in earlier studies but overall inference was that it was not so superior in assessment of age in later stages of pregnancy. In Femur length (FL) is another conventional parameter that has been explored earlier in relation to prediction of adverse pregnancy outcomes[80]. In the present study, we have recorded statistical significant correlation respect to GA .A recent report confirmed application of FL in evaluation of preeclampsia[81,82]. Moreover, Femur length (FL) measurement by ultrasonography helps in detection of short-limbed dysplasias in fetus in addtion to gestational age[83]. As far as accuracy is concerned, it offers best estiamtes of GA between 13 and 25 weeks gestation[84].

There was statistically significant correlation between TCD and GA.(p=0.001) Similar results were recorded in earlier reports. Goldstein et al, had established association between GA and TCD to be 0.948.3 Guan B et al[85], found r to be 0.99624 and Mayer WJ et al[86] found a strong correlation between TCD and GA (r = 0.9464).Moreover,Dilmen et al, (r =0.9767) as wellas Swaminathan et al (r = 0.89) reported similar results[87,88].

The consistent disparity between the gestational age predicted by TCD and that predicted by most other parameters was remarkable.there are studies which were conducted to see ability of TCD to predict accurately GA in SGA/FGR fetuses. A study , compared 19 FGR foetuses with thenormal population[89]. The birth weights of neonates was <10th percentile as all the TCD measurenments were seen to be in same range as for normal population. They concluded that this parameter remains unaffected by FGR.Same findings were obtained in another study where TCD in their 12 patients remained unaffected by severe FGR and predicted GA better[91,92].

Multiple Linear Regression Analysis

The multiple linear regression analyses results also supported the fact that TCD is superior than other four to predict other GA. To be more specific, multiple Linear analysis recorded highest T stat value for TCD and was 8.9913 confirming TCD as the best parameter for estimation of the Gestational Age. Furthermore, contribution of TCD was also highest in assessment of GA. Second best was femur length with t stat 7.241. Studies in recent years also favour use of TCD as superior factor for estimation of GA. TCD measurement allows assessment of thalami, cavum, septum pellucidum and third ventricle by rotating the transducer below thalamic plane[94]. Moreover, TCD is also accurate and superior in estimation of

gestational age of singleton and twin gestation[95]. So, all above reports justify our result that TCD is superior index for GA estimation. On the other hand, least useful parameter with respect to estimation of GA was noticed to be head circumference (HC) as it has just 3.99 % contribution towards GA estimation .The possible justfication for HC could be the fact that it is more useful in earlier stages of pregnancy and is more suitable for brain abnormalities.

Deviation In Gestational Age by TCD & Conventional Methods

The observance of standard deviation and analyses of significance by dependent *t test* helped in determination of GA accuracy by TCD and other conventional methods. The standard deviation was significantly less in case of TCD in comparison to GA biometry parameters.(composite of BPD,HC,AC,FL)This point could be justified on the basis of confirmed observations that GA parameters are variable in nature as they vary with increasing gestational age[96,97]. So, this imparts limitation on each of the above basic parameter for the assessment of gestational age. Biparietal diameter (BPD) is usually measured in the first and second trimester of preganancy as ultrasongoraphy results gets diluted in accuracy when pregnancy advances. So, most of these indices of fetal biometery are measured in first to second trimester only. Abnormal fetal head shape affects the BPD .Further, head circumference (HC) analyses is better parameter in comparison to BPD in terms of variability in accuracy in second or third trimester of pregnancy[98]. Femur length (FL) measurement by ultrasonography helps in detection of short- limbed dysplasias in fetus in addtion to gestational age[99]. As far as accuracy is concerned, it offers best estimates of GA between 13 and 25 weeks gestation[100]. On the other hand, TCD measurement remained unaffected by fetal growth retardation when compared to

other conventional ultrasonography parameters making it a versatile as well as accurate method of gestational age estimation. Moreover, TCD is not influenced by alterations in the fetal growth such as macrosomia.

Correlation between estimated Gestational ages by TCD with GA Biometry

Regression analysis was performed and scatter plots of TCD and GA, was generated. A curvilinear relationship was noticed between these parameters, which followed a third order polynomial equation. The study confirmed significant correlation of gestational ages by TCD with GA Biometry by hadlock formula.. ($r= 0.254$, $p<0.001$). These results could be justified on the basis of fact that USG appearances of fetal cerebellum change continuously with advancing gestation and these changes include both shape and echogenicity changes. The above observations again supported that TCD is better in comparison to others..

According to our study the predictive accuracy of TCD was 98.5% with discrepancy of ±6days from actual GA compared to FL (94.3% with discrepancy of ±12days from actual GA), BPD (93.8% with discrepancy of ± 15days from actual GA), AC (93.2% with discrepancy of ±15days from actual GA), HC(91.2% with discrepancy of ±18days from actual GA)

In study by adeyekun AA et al on 450 nigerian women between 14- 42 weeks. The predictive accuracy of TCD was greatest (96.9% with discrepancy of ±12days from actual GA), AC (92.7% with discrepancy of ±15.3day from actual GA), BPD (93.8% with discrepancy of ±14.1day from actual GA), HC (91.2% with discrepancy of ±18days from actual GA)

CONCLUSION

- There is strong association between TCD and GA
- There linear relationship between TCD and GA, TCD increases as GA progresses.
- Among all the five parameters Transcerebellar diameter had best Correlation with gestational age.
- There was a strong correlation between gestational age by TCD and gestational age by biometery (BPD, HC, FL, AC) .TCD can be used to calculate gestational age in place of biometry.
- Predictive accuracy of TCD was 98.5% with discrepancy of ±6daysfrom actual GA compared to FL (94.3% with discrepancy of ±12daysfrom actual GA), BPD (93.8% with discrepancy of ± 15daysfrom actual GA), AC (93.2% with discrepancy of ±15days), HC (91.2% with discrepancy of ±18daysfrom actual GA)
- Hence we can conclude that TCD is accurate, new alternative for predicting gestational age.
- It can be used as a reliable parameter for estimating gestational age in second and third trimester of pregnancy especially women who are unaware of LMP or have a dating scan.

SUMMARY

We conducted a prospective observational study on 500 pregnant women attending OPD between 26-36week of gestation from 1st January 2017 to 31st December 2017 after they met the inclusion criteria and consented to participate in study.

We observed that

- The mean age of pregnant women was 23.75yrs±2.67
- 55% were primigravida, 45% were multigravida.
- Majority of participants were between 32-36wk that is 59.8% of total.
- There was strong association between TCD and GA
- There was statistically significant correlation between gestational age and other parameters like BPD,HC, FL,AC
- Among five parameters TCD showed greatest correlation followed by FL, AC, BPD and HC
- There was strong correlation between gestational age by TCD and gestational age by biometry (BPD, AC, HC, FL), hence TCD can be used to calculate gestational age in place of biometry
- Predictive accuracy of TCD was 98.5% with discrepancy of ±6days compared to FL (94.3%± with discrepancy of 12daysfrom actual GA), BPD (93.8%± with discrepancy of 15daysfrom actual GA), AC (93.2% with discrepancy of ±15daysfrom actual GA), HC (91.2% with discrepancy of ±18daysfrom actual GA)

BIBILIOGRAPHY

1. Naidu K, Fredlund KL. Gestational Age Assessment. InStatPearls [Internet] 2018 Sep 20. StatPearls Publishing.
2. Campbell WA, Nardi D, Vintzileos AM, Rodis JF, Turner GW, Egan JF (1991) Transverse cerebellar diameter / abdominal circumference ratio throughout pregnancy : a gestational age- independent method to assess fetal growth. ObstetGynecol 1991 Jun; 863 - 6
3. Lynn L. Simpson. Fetal growth and well being. A practical guide to ultrasound in obstetrics and gynaecology, 2nd edition, chapter 21, 1988:403-416.
4. D.C Dutta's: Text book of obstetrics, 7th edition 2004, 73-74.
5. Committee Opinion No. 700 Summary. (2017). *The American College Of Obstetrics &Gynecology*, 129(5), pp.1 - 2.
6. Robinson HP, Fleming JE. A critical evaluation of sonar "crown-rump length" measurements. BJOG: An International Journal of Obstetrics & Gynaecology. 1975 Sep;82(9):702-10.
7. Hohler CW, Quetel TA. Comparison of ultrasound femur length and biparietal diameter in late pregnancy. American Journal of Obstetrics &Gynecology. 1981 Dec 1;141(7):759-62.
8. Hadlock FP, Deter RL, Harrist RB, Park SK. Estimating fetal age: computer-assisted analysis of multiple fetal growth parameters. Radiology. 1984 Aug;152(2):497-501.
9. Benson CB, Doubilet PM. Sonographic prediction of gestational age: accuracy of second-and third-trimester fetal measurements. AJR. American journal of roentgenology. 1991 Dec;157(6):1275-7.

10. Lee W, Barton S, Comstock CH, Bajorek S, Batton D, Kirk JS. Transverse cerebellar diameter: a useful predictor of gestational age for fetuses with asymmetric growth retardation. Am J ObstetGynecol, 1991 Oct;165(4):1044-1050.
11. A.S.M. Vinkesteijn, P.G.H. Mulder. Fetal transverse cerebellar diameter measurements in normal and reduced fetal growth. Ultrasound ObstetGynecol 2000; 15: 47–51.
12. Dubowitz L, Ricciw D, Mercuri E. The Dubowitz neurological examination of the full-term newborn. Mental retardation and developmental disabilities research reviews. 2005 Feb;11(1):52-60.
13. Ballard JL, Khoury JC, Wedig KL, Wang L, Eilers-Walsman BL, Lipp R. New Ballard Score, expanded to include extremely premature infants. The Journal of pediatrics. 1991 Sep 1;119(3):417-23.
14. Ultrasound In Obstetrics &Gynecology. (2012). 4th ed. New Delhi: Jaypee Brothers Medical Publishers (P) LTD, pp.3 - 4.
15. Campbell, S. (1968). *An Improved Method Of Fetal Cephalometry By Ultrasound*. London, pp.568 - 576.
16. Altman DQ Chilty LS. New charts for ultrasound dating of pregnancy. Ultrasound ObstetGynecol 1997;10: 174-91.
17. Abdulrehman J, Lausman A, Tang GH, Nisenbaum R, Petrucci J, Pavenski K, Hicks LK, Sholzberg M. Development and implementation of a quality improvement toolkit, iron deficiency in pregnancy with maternal iron optimization (IRON MOM): A before-and-after study. PLoS Med. 2019 Aug 20;16(8):e1002867.

18. Adeyekun AA, Orji MO.

    Predictive Accuracy Of Transcerebellar Diameter In Comparison With Otherfoet al Biometric Parameters For Gestational Age Estimation Among Pregnantnigerian Women. East Afr Med J 2014 Apr;91(4):138-44

19. Reddy RH, Prashanth K, Ajit M. Significance of

    Foetal Transcerebellar Diameter in Foetal Biometry: A Pilot Study. J ClinDiagn Res. 2017 Jun;11(6):TC01-TC04.

20. Adeyekun AA, Orji MO. Relationship between ultrasound estimated fetal gestational age and cerebellar appearance in healthy pregnant Nigerian women.

21. Hill LM, Guzik D, Fries J, Hixson J, Rivello D. The transverse cerebellar diameter in estimation of gestational age in large for gestational age foetuses. *ObstetGynecol*1990; 75: 981 – 985

22. Malik R, Pandya VK, Shrivastava P. Gestational age estimation using the transcerebellar diameter with grading of fetal cerebellum and evaluation of TCD/AC (transcerebellar diameter/abdominal circumference ratio) as a gestational age independent parameter. *Ind J Radio Imag*2003; 13: 95 – 97.

23. Quintero R, Kontopoulos E, Williams ME, Sloop J, Vanderbilt D, ChmaitRH.Neurodevelopmental outcome of monochorionic twins with selective intrauterine growth restriction(SIUGR) type II: laser versus expectant management. J Matern Fetal Neonatal Med. 2019 Jul 16:1-9

24. Degani S. Fetal biometry: clinical, pathological, and technical considerations. ObstetGynaecolSurv. 2001;56:159-67.

25. Lerner JP. Fetal growth and well-being. ObstetGynecolClin N Am. 2004;31:159-76.

26. Deter RL, Harrist RB, Hadlock FP, Carpenter RJ. Fetal head and abdominal circumferences: II. A critical re-evaluation of the relationship to menstrual age. J Clin Ultrasound. 1982;10(8):365-72.
27. Hadlock FP, Harrist RB, Deter RL, Park SK. Fetal femur length as a predictor of menstrual age: sonographically measured. AJR Am J Roentgenol. 1982;138(5):875-8.
28. Harris SR. Measuring head circumference: Update on infant microcephaly. Can Fam Physician. 2015 Aug;61(8):680-4.
29. Li Y, Pan MZ, Tao GW, Ma Z, Wu HF, Li Q. Effect of head circumference in combination with facial profile line on ultrasonic diagnosis of microcephaly. J Matern Fetal Neonatal Med. 2019 Jan 4:1-5
30. Mahoney MJ, Hobbins JC. Prenatal diagnosis of chondroectodermal dysplasia (Ellis-Van Creveld Syndrome) with fetoscopy and ultrasound. *N Eng J Med* 1997; 297: 258 – 260.
31. Chervenak FA, Skupski DW, Romero R, Myers MK, Smith-Levitin M, Rosenwaks Z *et al*. How accurate is fetal biometry in the assessment of fetal age? *Am J ObstetGynecol*1998; 178: 678 – 687.
32. Hill LM, Guzik D, Hixson J. Composite assessment of gestational age: a comparison of institutionally derived and published regression equation. *Am J ObstetGynaecol*1992; 166: 551 – 555.
33. Williams KP, Nwebube N. Abdominal circumference: a single measurement versus growth rate in the prediction of intrapartum Cesarean section for fetal distress. Ultrasound ObstetGynecol 2001 Jun;17(6):493-5.

34. Fay RA, Dey PL, Saadie CM, Buhl JA, Gebski VJ. Ponderal index: a better definition of the risk group with intrauterine growth problems than birth for gestational age in term infants. *Aust NZ J ObstetGynaecol*1991: 157: 17–9
35. Orji MO, Adeyekun AA. Ultrasound estimation of foetal gestational age by transcerebellar diameter in healthy pregnant nigerian women. West Afr J Med. 2014 Jan-Mar;33(1):61-7.
36. Vulturar D, Fărcăşanu A, Turcu F, Boitor D, Crivii C. The volume of the cerebellum in the second semester of gestation. Clujul Med. 2018;91(2):176-180
37. Lee W, Barton S, Comstock CH, Bajorek S, Batton D, Kirk JS. Transverse cerebellar diameter: A useful 9. predictor of gestational age for fetuses with asymmetric growth retardation. Am J Obstet Gynecol. 1991 Oct 1;165(4):1044-50.
38. Reece EA, Goldstein I, Pilu G, Hobbins JC. Fetal cerebellar growth unaffected by intrauterine growth retardation: A new parameter for prenatal diagnosis. Am J Obstet Gynecol. 1987 Sep 1;157(3):632-8.
39. Snijders RJ, De Courcy-Wheeler RH, Nicolaides KH. Intrauterine growth retardation and fetal transverse cerebellar diameter. Prenatal diagnosis. 1994 Dec;14(12):1101-5.
40. Chavez MR, Ananth CV, Smulian JC, Lashley S, Kontopoulos EV, Vintzileos AM. Fetal transcerebellar diameter nomogram in singleton gestations with special emphasis in the third trimester: a comparison with previously published nomograms. Am J Obstet Gynecol. 2003 Oct;189(4):1021-5.
41. Malik R, Pandya VK, Shrivastava P. Gestational age estimation using transcerebellar diameter with 51. grading of fetal cerebellum and evaluation of TCD/AC (Transcerebellar diameter/abdominal circumference) ratio as a

gestational age independent parameter. Indian J Radiol Imaging. 2003 Feb 1;13(1):95.

42. Smith PA, Johansson D, Tzannatos C, Campbell S. Prenatal measurement of the fetal cerebellum and cisterna cerebellomedullaris by ultrasound. PrenatDiagn. 1986 Mar-Apr; 6(2):133-41.
43. Reece EA, Goldstein I, Pilu G, Hobbins JC. Cerebellar measurements with ultrasonography in the evaluation of fetal growth and development. AM.J. Obstet. Gynecol 1987;156: 1065-1069.
44. Hata K, Hata T, Senoh D, Makihara K, Aoki S, Takamiya O, Kitao M. Ultrasonographic measurement of the fetal transverse cerebellum in utero. GynecolObstet Invest. 1989; 28(2):111-2.
45. Chavez MR, Ananth CV, Smulian JC, Yeo L, Oyelese Y, Vintzileos AM. Fetal transcerebellar diameter measurement with particular emphasis in the third trimester: a reliable predictor of gestational age. Am J Obstet Gynecol. 2004 Sep; 191(3):979-84.
46. Hill LM, Martin JG, Fries J, Hixson J. The role of the transcerebellarview in the detection of fetal central nervous system anomaly. Am J ObstetGynecol 1991; 164:1220-1224.
47. Montenegro NA and Leite LP. 1989. Fetal cerebellar measurement in second trimester ultrasonagraphy. J. Perinat. Med. 17(5): 365-9.
48. Agrawal C, Agrawal KK, Gandhi S. Assessment of fetal growth using the ratio of the transverse cerebellar diameter to abdominal circumference. Int J Gynaecol Obstet. 2016 Oct;135(1):33-7

49. Goldstein I, Tamir A, Reece EA. The fetal superior cerebellar vermian width in normal, growth-restricted and macrosomicfetuses. J Matern Fetal Med. 2001 Feb;10(1):23-27.
50. Meyer WG, Gauthier DW. The fetal TCD/AC ratio: a gestational age-independent method of assessing foetal size. J. Ultrasound Med.1993 Jul; 12(7):379-82. 1.
51. Tongsong T, Wanapirak C, Thongpadungroj T. Sonographic diagnosis of intrauterine growth restriction (IUGR) by fetal transverse cerebellar diameter (TCD)/abdominal circumference (AC) ratio. Int. J. Gynaecol Obstet. 1999 Jul; 66(1):1-5.
52. Pilu G, Romergo R, Reece EA, Goldstein I, Hobbins JC and Bovicelli L. 1988. Subnormal cerebellum in fetuses with Spina bifida. Am. J. Obs. Gyn. 158(5) : 1052-6.
53. Bronshtein M, Zimmer EZ and Blazer S. 1998 Isolated large fourth ventricle in early pregnancy a possible benign transient phenomenon, PrenatDiagn., 18(10) : 997 - 1000
54. Hashimoto K., Shimizu T., Shimoya.,Kanzaki T., clap JE., Murata y : fetal cerebellum – US appearance with advancing gestational age. haghi @ gyne.med.osaka.u.ac.jp: Radiology 2001 Oct ; 221 (1): 70 – 4.
55. Goldstein I, Reece EA 1995. Cerebellar growth in normal and growth-restricted fetuses of multiple gestations. AM J ObstetGynecol .1995 Oct; 174(4) : 1343 - 8
56. Rakic P, Sidman RL. Histogenesis of cortical layers in human cerebellum, particularly the lamina dissecans. J Comp Neurol 1970; 139: 473-500.

57. Zecevic N, Rakic P. Differentiation ofPurkinje cells and their relationship to other components'of developing cerebellar cortex in man. J Comp Neurol 1976; 167:27-47.
58. Selzer ME, Myers RE, Holstein SB. Maturations! changes in brain water and electrolytes in rhesus monkey with some implications for electrogenesis. Brain Res 1972; 45:193-204.
59. Hill LM, Martin JG, Fries J, Hixson J. The role of the transcerebellarview in the detection of fetal central nervous system anomaly. Am J ObstetGynecol 1991; 164:1220-1224.
60. Altman J. Postnatal development of the cerebellar cortex in the rat II. Phases in the maturation of Purkinje cells and of the molecular layer. J Comp Neurol 1972; 145:399-463.
61. Rees S, Harding R. The effects of intrauterine growth retardation on the development of the Purkinje cell dendritic tree in the cerebellar cortex of fetal sheep: a note on the ontogeny of the Purkinje cell. Int J DevNeurosci 1988; 6:461-469.
62. Wisniewski KE, Laure-Kamionowska M, Wisniewski HM. Evidence ofanest of neurogenesis and synaptogenesis in brains of patients with Down's syndrome. NEnglJMed 1984; 311:1187-1188.
63. Schmidt-Sidor B, Wisniewski KE, Shepard TH, SersenEA.Brain growth in Down syndrome subjects 15 to 22 weeks of gestational age and birth to 60 months. ClinNeuropathol 1990; 9:181-190.
64. Graupner O, Helfrich F, Ostermayer E, Lobmaier SM, Ortiz JU, Ewert P, Wacker-Gussmann A, Haller B, Axt-Fliedner R, Enzensberger C, Abel K, Karge A, Oberhoffer R, Kuschel B. Application of the INTERGROWTH-21st chart

compared to customized growth charts in fetuses with left heart obstruction: late trimester biometry, cerebroplacental hemodynamics and perinatal outcome. Arch Gynecol Obstet. 2019 Sep;300(3):601-613.

65. Goergen SK, Alibrahim E, Govender N, Stanislavsky A, Abel C, Prystupa S, Collett J, Shelmerdine SC, Arthurs OJ. Diagnostic assessment of foetal brain malformations with intra-uterine MRI versus perinatal post-mortem MRI. Neuroradiology. 2019 Aug;61(8):921-934
66. Won YB, Han SW, Kim EH. Clinical factors and ultrasound parameters to predict successful vaginal delivery following labour induction. J ObstetGynaecol. 2019 Sep 4:1-7
67. Pam VC, Yilgwan CS, Shwe DD, Abok I. Head Circumference of Babies at Birth in Nigeria. J Trop Pediatr. 2019 Apr 28. pii: fmz024
68. Mateus J, Newman RB, Zhang C, Pugh SJ, Grewal J, Kim S, Grobman WA, Owen J, Sciscione AC, Wapner RJ, Skupski D, Chien E, Wing DA, Ranzini AC, Nageotte MP, Gerlanc N, Albert PS, Grantz KL. Fetal Growth Patterns in Pregnancy-Associated Hypertensive Disorders: NICHD Fetal Growth Studies. Am J Obstet Gynecol. 2019 Jun 18. pii: S0002-9378(19)30792-6
69. Shirazi M, Niroomanes S, Rahimi F, Golshahi F. Ultrasound Assessment of Fetal Biometry in Iranian Normal Pregnancies. Int J Prev Med. 2019 Apr 26;10:46.
70. Ciobanu A, Khan N, Syngelaki A, Akolekar R, Nicolaides KH. Routine ultrasound at 32 vs 36 weeks' gestation: prediction of small-for-gestational-age neonates. Ultrasound Obstet Gynecol. 2019 Jun;53(6):761-768
71. Hendrix MLE, van Kuijk SMJ, Gavilanes AWD, Kramer D, Spaanderman MEA, Al Nasiry S. Reduced fetal growth velocities and the association with neonatal

outcomes in appropriate-for-gestational-age neonates: a retrospective cohort study. BMC Pregnancy Childbirth. 2019 Jan 15;19(1):31.

72. Fetal growth trajectories and their association with maternal and child characteristics. Bartels HC, O'Connor C, Segurado R, Mason O, Mehegan J, Geraghty AA, O'Brien E, Walsh J, McAuliffe F. J Matern Fetal Neonatal Med. 2019 Jan 6:1-7
73. Osho ES, Ibitoye BO, Adetiloye VA, Adeyemi AB, Aderibigbe AS, Omisore AD. Ultrasonic determination of gestational age by assessment of fetal kidney size in the third trimester in southwest Nigeria Int J Gynaecol Obstet. 2019 Mar;144(3):271-276
74. Karthikeyan T, Subramaniam RK, Johnson W, Prabhu K. Placental thickness & its correlation to gestational age & foetal growth parameters- a cross sectional ultrasonographic study. J ClinDiagn Res. 2012 Dec;6(10):1732-5.
75. Karabulut AK, Köylüoğlu B, Uysal I. Human foetal sacral length measurement for the assessment of foetal growth and development by ultrasonography and dissection. AnatHistolEmbryol. 2001 Jun;30(3):141-6.
76. Hsu JC, Wu YC, Wang PH, Wang HI, Juang CM, Chen YJ, Chang CM, Horng HC, Chen CY, Yang MJ, Yen MS, Chao KC. Quantitative analysis of normal fetal brain volume and flow by three-dimensional power Doppler ultrasound. J Chin Med Assoc. 2013 Sep;76(9):504-9.
77. Karthikeyan T, Subramaniam RK, Johnson W, Prabhu K. Placental thickness & its correlation to gestational age & foetal growth parameters- a cross sectional ultrasonographic study. J ClinDiagn Res. 2012 Dec;6(10):1732-5.

78. Muhs BE, Jordan W, Ouriel K, Rajaee S, de Vries JP. Matched cohort comparison of endovascular abdominal aortic aneurysm repair with and without EndoAnchors. J Vasc Surg. 2018 Jun;67(6):1699-1707.
79. Vannuccini S, Ioannou C, Cavallaro A, Volpe G, Ruiz-Martinez S, Impey L. A reference range of fetal abdominal circumference growth velocity between 20 and 36 weeks' gestation. PrenatDiagn. 2017 Nov;37(11):1084-1092
80. Salinaro JR, McNally PJ, NickenigVissoci JR, Ellestad SC, Nelson B, Broder JS. A prospective blinded comparison of second trimester fetal measurements by expert and novice readers using low-cost novice-acquired 3D volumetric ultrasound. J Matern Fetal Neonatal Med. 2019 Aug 7:1-9.
81. van den Heuvel TLA, de Bruijn D, Moens-van de Moesdijk D, Beverdam A, van Ginneken B, de Korte CL. Comparison Study of Low-Cost Ultrasound Devices for Estimation of Gestational Age in Resource-Limited Countries. Ultrasound Med Biol. 2018 Nov;44(11):2250-2260.
82. Peixoto AB, da Cunha Caldas TMR, Dulgheroff FF, Martins WP, AraujoJúnior E. Fetal biometric parameters: Reference charts for a non-selected risk population from Uberaba, Brazil. J Ultrason. 2017 Mar;17(68):23-29
83. Mateus J, Newman RB, Zhang C, Pugh SJ, Grewal J, Kim S, Grobman WA, Owen J, Sciscione AC, Wapner RJ, Skupski D, Chien E, Wing DA, Ranzini AC, Nageotte MP, Gerlanc N, Albert PS, Grantz KL. Fetal Growth Patterns in Pregnancy-Associated Hypertensive Disorders: NICHD Fetal Growth Studies. Am J Obstet Gynecol. 2019 Jun 18. pii: S0002-9378(19)30792-6.
84. Hendrix MLE, van Kuijk SMJ, Gavilanes AWD, Kramer D, Spaanderman MEA, Al Nasiry S. Reduced fetal growth velocities and the association with neonatal

outcomes in appropriate-for-gestational-age neonates: a retrospective cohort study. BMC Pregnancy Childbirth. 2019 Jan 15;19(1):3

85. Guan B. Surveillance of fetal growth and fetal cerebellar transverse diameter by ultrasonographic measurement. Zhonghua Yi XueZaZhi. 1992 Feb;72(2):65-7.
86. Meyer WJ, Gauthier D, Ramakrishnan V, Sipos J. Ultrasonographic detection of abnormal fetal growth with the gestational age-independent, transverse cerebellar diameter/abdominal circumference ratio. Am J Obstet Gynecol. 1994 Oct 1;171(4):1057-63.
87. Dilmen G, Toppare MF, Turhan NÖ, Öztürk M, Işik S. Transverse cerebellar diameter and transverse cerebellar diameter/abdominal circumference index for assessing fetal growth. Fetal DiagnTher. 1996;11(1):50-6.
88. Swaminathan M, Davies MW, Davis PG, Betheras FR. Transverse cerebellar diameter on cranial ultrasound scan in preterm neonates in an Australian population. J Paedia Child Health. 1999;35(4):346-
89. Reece EA, Goldstein I, Pilu G, Hobbins JC. Fetal cerebellar growth unaffected by intrauterine growth retardation: A new parameter for prenatal diagnosis. Am J Obstet Gynecol. 1987 Sep 1;157(3):632-8.
90. Duchatel F, Mennesson B, Berseneff H, Oury JF. Antenatal echographic measurement of the fetal cerebellum. Significance in the evaluation of fetal development. J GynecolObstetBiolReprod (Paris). 1989; 18(7):879-83.
91. Reddy RH, Prashanth K, Ajit M. Significance of Foetal Transcerebellar Diameter in Foetal Biometry: A Pilot Study. J ClinDiagn Res. 2017 Jun;11(6):TC01-TC04
92. Agrawal C, Agrawal KK, Gandhi S. Assessment of fetal growth using the ratio of the transverse cerebellar diameter to abdominal circumference. Int J Gynaecol Obstet. 2016 Oct;135(1):33-7.

93. Malik G, Waqar F, Ghaffar A, ZaidiH.Determination of gestational age transverse cerebellar diameter in third trimester of pregnancy.JColl Physicians Surg Pak. 2006 Apr;16(4):249-52

94. Goldstein I, Tamir A, Reece EA.The fetal superior cerebellar vermian width in normal, growth-restricted and macrosomicfetuses.JMatern Fetal Med. 2001 Feb;10(1):23-

95. Chavez MR, Ananth CV, Kaminsky LM, Smulian JC, Yeo L, VintzileosAM.Fetal transcerebellar diameter measurement for prediction of gestational age in twins. Am J Obstet Gynecol. 2006 Dec;195(6):1596-600. Epub 2006 May 16.

96. Deter RL, Harrist RB, Hadlock FP, Carpenter RJ. Fetal head and abdominal circumferences: II. A critical re-evaluation of the relationship to menstrual age. J Clin Ultrasound. 1982;10(8):365-72.

97. Hadlock FP, Harrist RB, Deter RL, Park SK. Fetal femur length as a predictor of menstrual age: sonographically measured. AJR Am J Roentgenol. 1982;138(5):875-8.

98. Li Y, Pan MZ, Tao GW, Ma Z, Wu HF, Li Q. Effect of head circumference in combination with facial profile line on ultrasonic diagnosis of microcephaly. J Matern Fetal Neonatal Med. 2019 Jan 4:1-5

99. Mahoney MJ, Hobbins JC. Prenatal diagnosis of chondroectodermal dysplasia (Ellis-Van Creveld Syndrome) with fetoscopy and ultrasound. *N Eng J Med* 1997; 297: 258 – 260.

1. Chervenak FA, Skupski DW, Romero R, Myers MK, Smith-Levitin M, Rosenwaks Z *et al*. How accurate is fetal biometry in the assessment of fetal age? *Am J ObstetGynecol*1998; 178: 678 – 687.

ANNEXURE I

Consent For Participation In The Research Study

"CORRELATION BETWEEN FETAL TRANCEREBELLAR DIAMETER & GESTATIONAL AGE – A HOSPITAL BASED OBSERVATIONAL STUDY"

Purpose:

Many Women are don't know their Last Menstural Cycle, hence estinating the Gestational Age has become a matter of concern. Gestational Age is very important in management of pregnancy; hence we are conducting this study to know how effective is TranscerebellarDiameter in predicting the Gestational Age from 26 – 36 weeks of pregnancy.

Procedure:

If you agree to participate in the study, fist you will be asked to sign the consent form, then we shall be collecting your data like socio – demographic, antenatal & past medical history. You shall be subjected to Ultrasound Scan for the measurement of Transcerebellar Diameter. The results shall be assessed.

Benefits:

There shall be no benefits of taking part in the research. There are no observational risks associated with the study. By participating you will be ensuring that women in future shall get best care and outcome.

Privacy & Confidentiality:

The only people to know that you are a subject of the research are the members in the research team. No information provided by you during the research shall be disclosed to others with your written permission except:

- In emergency to protect your life & welfare
- If required by the law

Voluntary Participation / Withdrawal:

Your participation in the research is voluntary. You can withdraw from the study at any time. Your decision will not change present or future health care services offered to you at K.L.E's Hospital.

Consent Statement:

I, _____ voluntarily agree for the participation as a subject of study. By signing this consent form I am not giving up any of my legal rights, I may withdraw from the study anytime. I am signing the consent form after having read or been read form in vernacular language, including the risks and the benefits and having all my questions answered.

Participant Name: _____

Signature or the Left Thumb Print of Subject: _____

Witness Name:_____ Signature: _____

Investigators Name: _____ Signature: _____

Date: _____

Place: _____

ANNEXURE II

Performa For The Study

SL.NO:-

FIRST NAME : _____

MIDDLENAME : _____

LASTNAME : _____

HUSBAND'S NAME: _____

IP NO : _____

ADDRESS
HOUSE NO : _____

STREET : _____

TALUKA : _____

DISTRICT : _____

PHONE NO : _____

1-YES 2-NO

DIABETES ☐

HYPERTENSION ☐

IUGR ☐

MULTIPLE PREGNANCIES ☐

CONGENITAL ANOMALY ☐

OTHERS ☐

GRAVIDA ☐ **PARA** ☐ **BORTIONLIV** ☐ ☐

LAST MENSTRUAL PERIOD : _____

EXPECTED DATE OF DELIVERY:_____

GESTATIONAL AGE : _____

PER ABDOMINAL EXAMINATION: **28-30WEEK** ☐ **30-32WEEKS** ☐

32-34 WEEKS ☐ **34-36WEEKS** ☐

ULTRASOUND PARAMETERS:_____

CROWN RUMP LENGTH :_____

EDD ACCORDING TO FIRST TRIMESTER:_____

BIPARIETAL DIAMETER :_____

HEAD CIRCUMFERENCE : _____

FEMUR LENGTH : _____

TRANSCEREBELLAR DIAMETER:_____

ANNEXURE III

Ethical ClearanceFor The Study

K.L.E.UNIVERSITY'S
JAWAHARLAL NEHRU MEDICAL COLLEGE,
NEHRU NAGAR, BELAGAVI-590010 (KARNATAKA-INDIA)
(Accredited 'A' Grade by NAAC)

Website: http://www.jnmc.edu
E-Mail : dome@jnmc.edu

Phone: (+ 91-(0)831 Office : 2471350
Principal: 2471701
Fax No. +91 (0)831 – 2470759

Ref: MDC/DOME/ 67 **Date: 22/11/2017**

To,

[redacted]
PG student in Obstetrics and Gynaecology,
J.N.Medical College.
BELAGAVI.

Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled **"CORRELATION BETWEEN FETAL TRANSCEREBELLAR DIAMETER & GESTATIONAL AGE – A HOSPITAL BASED OBSERVATIONAL STUDY"**, is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee on Human Subjects Research.

(Dr. Arathi Darshan)
Member Secretary
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

(Dr. Roopa M Bellad)
Chairman,
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

ANNEXURE IV

Key Words Of Master Chart

G	**-**	**GRAVIDA**
P	**-**	**PARA**
A	**-**	**ABORTION**
L	**-**	**LIVING**
LMP	**-**	**LAST MENSTURAL CYCLE**
GA	**-**	**GESTATIONAL AGE**
CEDD	**–**	**CORRECTED EXPECTED DATE OF DELIVERY**
BPD	**-**	**BIPARIETAL DIAMETER**
HC	**-**	**HEAD CIRCUMFARENCE**
AC	**-**	**ABDOMINAL CIRCUMFARENCE**
FL	**-**	**FEMUR LENGTH**
TCD	**-**	**TRANSCEREBELLAR DIAMETER**

Sl. No.	IP No.	AGE	G	P	A	L	LMP	EDD	GA	CEDD	DATING SCAN	BPD	HC	AC	FL	TCD	GA BIOMERY (weeks)
1	890505	24yrs	2	1	0	1	26/12/2017	02/10/2018	31WK	02/10/2018	9WK(22MM)	7.79CM	28.2CM	27.2CM	5.98CM	3.24CM	31.1
2	4437559	20yrs	2	1	0	1	12/04/2017	17/01/2018	35wk+2DAY	05/02/2018	12wk+6day(58MM)8.2cm	8.2CM	29.3CM	28.4CM	6.5CM	4.49CM	36
3	4540544	26yr	2	1	0	1	30/07/2018	06/05/2018	30WK+2DAY	06/05/2018	9WK+4DAY(26MM)	7.8CM	29.2CM	24CM	6.1CM	3.7CM	30.1
4	4717869	24yrs	2	1	0	1	08/08/2018	15/05/2018	3OWK+3DAYS	15/05/2018	9WK (22MM)	7.3CM	27.4CM	25.6CM	3.4CM	5.3CM	30.2
5	4992232	25yrs	3	1	1	1	18/07/2017	24/04/2018	33wk4DAYS	24/04/2018	10WK(36MM)	8.4CM	31.3CM	27.7CM	6.3CM	4.6CM	32.1
6	4634120	20yrs	2	1	0	1	18/09/2017	25/06/2018	26WK+3DAYS	25/06/2018	12wk+6day(58MM)8.2cm	7.6CM	26.6CM	22.1CM	4.8CM	3.1CM	26
7	4714703	27yrs	2	0	1	0	18/09/2018	26/06/2018	26WK	25/06/2018	13WK(75MM)	6.5CM	24CM	22CM	4.9CM	3.03CM	26
8	4586366	25yrs	1	0	0	0	20/08/2018	27/05/2018	26WK+5DAYS	15/06/2018	10WK+5DAYS(37MM)	7CM	24.7CM	22.8CM	4.6CM	3.06CM	26.2
9	4709409	20yrs	1	0	0	0	18/08/2018	23/05/2018	28WK+1DAY	25/05/2008	9WK+4DAY(26MM)	6.7CM	24.8CM	25.8CM	5.4CM	3.4CM	28.4
10	4613771	32yrs	2	1	0	0	11/04/2017	18/01/2018	33WK	18/01/2018	9WK+2DAY(25MM)	8.1CM	29.2CM	26.9CM	6.2CM	4.4CM	32.6
11	4620690	20yrs	2	0	1	0	02/06/2017	09/03/2018	27wk+2days	09/03/2018	11WK+3DAYS (45MM)	6.2CM	25.2CM	21CM	4.9CM	3.13CM	28.2
12	4321567	24yrs	1	0	0	0	17/06/2017	24/03/2018	26WKS	24/03/2008	11WK4DAYS(45MM)	6.6CM	24.6CM	22CM	5CM	2.66CM	25.6
13	5656787	18yrs	1	0	0	0	12/05/2017	16/02/2018	31wk+3days	16/02/2018	9WKS(22MM)	7.4CM	28.3CM	27CM	6.1CM	4CM	31.6
14	5432784	24yrs	1	0	0	0	10/05/2017	14/02/2018	32WK+1DAY	14/02/2008	8WK+5DAY(21MM)	7.7CM	28.2CM	25.3CM	6.4CM	3.79CM	33.2
15	4536832	20yrs	2	1	0	1	28/04/2017	02/02/2018	32+6WK	11/02/2018	12WK+4DAY(59MM)	7.3CM	27.6CM	26CM	23.9CM	4.1CM	32.1
16	4487241	32yrs	2	1	0	1	24/05/2018	28/02/2018	29w+2day	08/03/2018	7wk+2day (8mm)	7.8cm	28.2cm	25.2cm	6.1cm	3.8cm	29.2
17	3653096	28yrs	2	1	0	1	27/05/2017	03/03/2018	30WK+5DAY	30/03/2018	8WK+3DAY(25MM)	7.1CM	25.9CM	23.8CM	5.3CM	3.4CM	31.1
18	4658243	30yrs	3	2	0	2	15/08/2018	15/08/2018	32WKK+3DAY	08/11/2018	8WK+3DAY(24MM)	8.2CM	30.8CM	28.4CM	6.4CM	3.8CM	32.2
19	893456	26yrs	1	0	0	0	NOT KNOWN	03/09/2018	35WK+4DAY	03/09/2018	9WK(22MM)	9.04CM	32.4CM	29.2CM	6.42CM	4.21CM	35
20	890229	24yrs	1	0	0	0	26/12/2017	02/10/2018	31WK+2DAY	02/10/2018	9WK+4DAY(26MM)	7.54CM	28.8CM	27.4CM	5.9CM	3.23CM	31.1
21	4234171	21yrs	2	0	1	0	13/01/2018	20/10/2018	29WKS	20/10/2018	12WK(52MM)	7.32CM	27CM	23.9CM	5.66CM	3.08CM	29.5
22	4234567	24yrs	1	0	0	0	23/12/2018	29/09/2018	31WK+1DAY	29/09/2019	9WK(22MM)	8.12CM	30.1CM	25.7CM	5.90CM	3.60CM	32
23	823456	20yrs	2	1	0	1	13/11/2018	24/09/2018	32WK+1DAY	24/09/2018	7WK+2DAY(12MM)	7.79CM	29.7CM	24.2CM	5.72CM	3.89CM	30.6
24	4711754	20yrs	2	1	0	1	10/12/2017	16/09/2018	31WK+1DAY	16/09/2018	13WK+6DAY (68MM)	6.9CM	27.9CM	24.2CM	5.8CM	3.51CM	29.1
25	4867396	22yrs	1	0	0	0	NOT KNOWN	04/09/2018	31wk+1day	04/09/2018	8wk+4day(18mm)	6.5CM	23.3CM	24.4CM	5.9CM	2.6CM	28.1
26	2779708	20yrs	2	1	0	1	09/12/2017	05/09/2018	29WK+5DAY	05/09/2018	12WK(62MM)	7.7CM	27.8CM	27.8CM	5.4CM	3.14CM	30.1
27	3712776	19yrs	2	0	0	0	30/11/2017	06/09/2018	30WK+6DAY	06/09/2018	12WK+3DAY(53MM)	7.7CM	29.1CM	24.7CM	6CM	4.08CM	31.1
28	4660954	20yrs	2	1	0	1	31/10/2017	07/08/2018	34WK+6DAYS	07/08/2018	13WK+3DAYS(68MM)	7.9CM	29.2CM	25CM	6.4CM	4.52CM	31.1
29	5478900	28yrs	2	1	0	1	23/11/2018	30/08/2018	32WK+1DAY	30/08/2018	7WK+6DAYS(12MM)	7.3CM	27.8CM	25.5CM	5.8CM	4.03CM	30.6
30	4860631	24yrs	1	0	0	0	02/12/2018	08/09/2018	31wk+4day	15/10/2018	9wk+4day(31mm)	8.1CM	28.8CM	26.9CM	6.2CM	3.31CM	32.1
31	4775778	28yrs	1	0	0	0	18/01/2018	25/10/2018	30wk	25/10/2018	13 wk(75mm)	8CM	27.2CM	25.6CM	5.8CM	3.04CM	31.1
32	3521422	21yrs	1	0	0	0	24/12/2017	30/09/2018	33wk+4day	30/09/2018	10wk+1day(30mm)	8.4CM	29.2CM	28.7CM	6.6CM	3.46CM	33
33	2890954	20yrs	1	0	0	0	20/12/2017	26/09/2018	34WK+1DAY	26/09/2018	9WK(22MM)	8.5CM	31CM	29.4CM	6.4CM	3.65CM	34.2
34	4495386	28yrs	1	0	0	0	03/01/2018	10/10/2018	31wk+3days	10/10/2018	10wk+1day(39mm)	7.8CM	28.2CM	27CM	5.8CM	4.07CM	31.1
35	4871086	20yrs	2	1	0	1	05/12/2017	11/09/2018	35WKS	11/09/2018	11WK+6DAYS(62MM)	8.6CM	31.2CM	30.4CM	6.8CM	3.61CM	35.6
36	3206307	21yrs	1	0	0	0	11/12/2017	17/09/2018	34wk+4days	11/12/2017	13WK+1DAY(77MM)	8.2CM	30.2CM	29.2CM	6.4CM	3.64CM	33
37	4867917	22yrs	2	1	0	1	13/02/2018	20/11/2018	27wk+3days	20/11/2018	9WEEKS(22MM)	6.7CM	25.6CM	21.7CM	5.2CM	3.0CM	26.6
38	3382664	18yrs	1	0	0	0	NOT KNOWN	06/12/2018	26WK	06/12/2018	10WK+1DAY(30MM)	6.3CM	23.7CM	21.5CM	4.8CM	2.6CM	25.1
39	4644789	21yr	1	0	0	0	18/09/2018	25/06/2018	36wk	11/07/2018	22mm(9wk)	7.87cm	28cm	29.3cm	6.3cm	4.96cm	36.2
40	4945656	21yr	1	0	0	0	20/04/2018	25/01/2019	34wk+4day	25/01/2019	8wk+2day(15mm)	8.8cm	31.2cm	28.2cm	6.6cm	3.55cm	35

41	4783012	28yrs	2	1	0	1	01/02/2018	08/11/2018	27wk	08/11/2018	9WK(22MM)	6.9cm	26.2cm	22.2cm	5.4cm	3.61cm	27.2
42	4662719	20yr	1	0	0	0	26/10/2017	02/08/2018	26wk	02/08/2018	24mm(9wk)	6.4cm	23.3cm	21.6cm	4.4cm	2.7cm	25.4
43	4706955	29yrs	1	0	0	0	25/12/2018	01/10/2018	32wk+3days	01/10/2018	12wk+3days(56mm)	8.5CM	30.7CM	28.6CM	6.33CM	3.33CM	34.1
44	4765899	28yrs	2	1	0	1	21/12/2017	27/09/2018	32WK+6DAYS	27/09/2018	9WK(22MM)	8.1CM	29CM	26.2CM	6.1CM	3.56CM	32
45	4869625	28yrs	1	0	0	0	09/01/2018	16/10/2018	30WK+1DAY	16/10/2018	7WK+2DAY(6MM)	7.7CM	27.6CM	25.8CM	5.7CM	3.04CM	31
46	4886249	20YRS	1	0	0	0	06/12/2017	12/09/2018	35WKS	12/09/2018	10WK+2DAY(34MM)	8.8CM	30.9CM	31.7CM	6.8CM	4.0CM	37.2
47	4774611	24YRS	2	1	0	1	20/12/2017	26/09/2018	33WK	26/09/2018	9WK+2DAY(22MM)	8.1CM	29.8CM	27.2CM	6.2CM	3.57CM	33.1
48	4801317	21yrs	2	1	0	1	10/12/2017	16/09/2018	35wk+3days	16/09/2018	10wk+1day32mm)	8.9CM	31.7CM	28.7CM	6.6CM	4.31CM	36.2
49	4897434	26yrs	2	0	1	0	06/01/2018	13/10/2018	33wks	13/10/2018	11wk(50mm)	7.6cm	29.2cm	28cm	5.9cm	3.63cm	32.4
50	4777265	22yrs	1	0	0	0	29/10/2017	05/08/2018	33wk+2day	05/08/2018	9wk+4day(26mm)	7.79cm	29.5cm	27.3cm	6.2cm	4.3cm	33.6
51	4779959	21yr	2	1	0	1	21/08/2017	28/05/2018	29wk	28/05/2018	9wk(22mm)	6.64cm	25.4cm	21.1cm	4.86cm	3.01cm	29.5
52	4728398	19yrs	2	1	0	1	08/11/2017	15/08/2018	26wk	13/08/2018	9wk+1day(24mm0	6.2cm	23.8cm	20.6cm	4.8cm	2.7cm	25.4
53	4879311	22yrs	2	0	1	0	19/11/2017	26/08/2018	30wk+1day	26/08/2018	8wk+6day(22mm0	6.7cm	27cm	25.2cm	5.24cm	3.31cm	30.6
54	3382664	21yrs	2	1	0	1	NOT KNOWN	05/12/2017	26wk	05/12/2017	8WK+5DAY(21MM)	6.3cm	23.7cm	21.5cm	4.8cm	2.6cm	25.4
55	4808871	26yr	3	2	0	2	27/01/2018	03/11/2018	29wk+5day	15/11/2018	13wk(75mm)	7.4cm	28.5cm	26.4cm	5.8cm	3.6cm	30.1
56	4788844	19yrs	1	0	0	0	01/01/2018	08/10/2018	34wk+1day	08/10/2018	6wk+1day(3mm)	8.8cm	30.7cm	30.4cm	6.6cm	3.8cm	35.6
57	4747376	29yrs	1	0	0	0	01/01/2018	08/10/2018	34wk+1day	08/10/2018	12wk+3day(53mm)	8.2cm	30.1cm	29.5cm	6.2cm	3.54cm	34.3
58	4125369	24yrs	2	1	0	1	20/12/2017	26/09/2018	35wk+6day	26/09/2018	10wk+1day(30mm)	8.3cm	30.6cm	30.1cm	6.8cm	3.94cm	35.1
59	4781336	21yr	2	1	0	1	07/01/2018	14/10/2018	33wk+2days	14/10/2018	9WK(22MM)	7.9CM	29.8cm	29.5cm	6.3cm	3.5cm	33.6
60	4751842	24yrs	1	0	0	0	30/12/2017	06/10/2018	35wk	02/10/2018	8wk+3day(17mm)	8.1cm	30.3cm	29.2cm	6.4cm	4.2cm	34.1
61	4795928	24yrs	1	0	0	0	21/02/2018	28/11/2018	26wk+5days	21/02/2018	9wk+4day(22mm0	6.8cm	24.1cm	21.4cm	5.0cm	4.06cm	26.2
62	4917965	26yr	2	1	0	1	02/02/2018	09/11/2018	29wk+3day	09/11/2018	13wk(75mm)	7.5cm	26.2cm	25cm	5.5cm	3.03cm	30
63	4745620	21yrs	1	0	0	0	21/12/2017	27/09/2018	35wk+4days	27/09/2018	9wk(24mm)	8.6cm	30.5cm	31.2cm	6.6cm	3.7cm	36
64	3731419	26yr	3	1	1	1	24/12/2017	30/09/2018	33wk+2day	13/10/2018	11wk(42mm)	8.4cm	27.5cm	7.8cm	3.65cm	3.45cm	32.1
65	4845151	20yr	2	0	1	0	27/01/2018	03/11/2018	30wk+2day	03/11/2018	13wk+5day(65mm)	7.9cm	26.6cm	23.5cm	5.5cm	3.28cm	30.3
66	3599507	24yrs	2	1	0	1	26/12/2017	02/10/2018	34WK+6DAYS	02/10/2018	8wk+6day(18mm)	8.2cm	28.8cm	27.5cm	6.7cm	3.61cm	34.1
67	4787861	24yrs	1	0	0	0	01/02/2018	08/11/2018	28wk+3day	08/11/2018	12wk+1day(55mm)	7.2cm	26.4cm	22.3cm	5.5cm	3.12cm	29.2
68	4878531	29yrs	1	0	0	0	25/12/2017	01/10/2018	33wk+5day	01/10/2018	12wk+3day(54mm)	8.8cm	30.2cm	27.8cm	6.4cm	3.42cm	35.1
69	4885045	20yr	1	0	0	0	06/02/2018	13/11/2018	27wk	13/11/2018	9WK(22MM)	6.2cm	23.5cm	20.3cm	4.5cm	3.1cm	25.6
70	4730696	28yrs	1	0	0	0	16/12/2017	22/09/2018	35wk	22/09/2018	13wk(74mm)	8.9cm	30.3cm	28.5cm	6.6cm	3.73cm	36
71	4813981	26yr	2	0	1	0	21/01/2018	28/10/2018	29wk+6days	28/10/2018	11wk(36mm)	7.9cm	27.3cm	23.2cm	5.8cm	3.15cm	30
72	4846128	26yr	2	1	0	1	15/11/2017	22/09/2018	35wk+3days	22/09/2018	13wk(72mm)	8.1cm	29.8cm	25.8cm	6.4cm	3.95cm	33
73	4827680	24yrs	2	0	1	0	31/01/2018	07/11/2018	28wk+5days	07/11/2018	11wk+6days(50mm)	7.3cm	25.9cm	23.7cm	5.3cm	3.1cm	28.4
74	4805709	24yrs	2	1	0	1	29/12/2017	16/10/2018	32wks	16/10/2018	12wk+6days(61mm)	8cm	30cm	28cm	6cm	3.66cm	32
75	4866301	21yrs	1	0	0	0	01/01/2018	08/10/2018	33wk+1day	08/10/2018	12wk+6day(62mm)	8.2cm	31.2cm	27cm	6.5cm	3.47cm	34
76	4879311	28yrs	1	0	0	0	17/12/2017	23/09/2018	35wks+4days	23/09/2018	11wks(48mm)	9.2cm	31.4cm	31.4cm	6.8cm	3.8cm	37.2
77	4799081	25yrs	2	1	0	1	17/01/2018	24/10/2018	31weeks+1day	24/10/2018	11wks+6days(52mm)	7.3cm	27.4cm	25.2cm	5.7cm	4.04cm	29.6
78	4758039	24yrs	1	0	0	0	20/12/2018	26/09/2018	35wks	29/09/2018	9wks(23mm)	8.6cm	31.4cm	29.2cm	6.7cm	4cm	35.1
79	4890950	26yrs	3	1	1	1	12/12/2017	29/09/2018	34wks+4days	29/09/2018	9wks+4days(24mm)	8.7cm	31.4cm	28.8cm	6.6cm	3.93cm	35
80	4867343	20yrs	2	1	0	1	13/12/2017	19/09/2018	35wks+5 days	19/09/2018	12wks+1day(53mm)	8.3cm	29.3cm	28.3cm	6.7cm	3.75cm	34.6
81	4739722	28yrs	2	1	0	1	05/01/2018	12/10/2018	32wks+5days	12/10/2018	12wks+6days(58mm)	7.7cm	29.6cm	27.2cm	6.1cm	3.85cm	31.6
82	4906065	25yrs	2	1	0	1	03/01/2018	21/11/2018	27weeks+3days	21/11/2018	9wks(22mm)	6.7cm	24.9cm	21.7cm	5cm	3.09cm	26.4
83	4859039	24yrs	2	1	0	1	22/02/2018	29/11/2018	26wks+2days	29/11/2018	9wks(23mm)	6.4cm	22.6cm	20.7cm	4.6cm	3.03cm	25.6
84	4767377	24yrs	1	0	0	0	23/01/2018	30/10/2018	30wks+4days	30/10/2018	13wks(75mm)	7.9cm	29.1cm	26.3cm	5.6cm	3.2cm	31.2

85	3642619	24yrs	3	1	1	1	17/01/2018	24/10/2018	31wks+3days	24/10/2018	9wks+4days(24mm)	7.6cm	28.0cm	25.8cm	5.9cm	4.18cm	30.6
86	3712584	18yrs	2	1	0	1	20/02/2018	27/11/2018	26wks+3days	27/11/2018	10wks(28mm)	6.4cm	24.1cm	21.6cm	5cm	2.9cm	26
87	4876739	28yrs	1	0	0	0	22/02/2018	29/11/2018	26wks+1day	29/11/2018	9wks(20mm)	7.1cm	25.3cm	22cm	4.8cm	3.02cm	27
88	4747457	28yrs	2	1	0	1	09/01/2018	16/10/2018	32wks+3days	16/10/2018	18wks+1day(75mm)	8.8cm	31.1cm	28.8cm	6.6cm	3.72cm	35.3
89	4747457	22yrs	1	0	0	0	25/02/2018	02/12/2018	26wks	02/12/2018	9wks+4days(24mm)	6.1cm	23.4cm	20.9cm	4.6cm	2.7cm	25.6
90	4904522	24years	1	0	0	0	08/02/2018	25/11/2018	26wks+3days	25/11/2018	10wks(30mm)	6.4cm	22.5cm	19.1cm	4.4cm	3.5cm	25.3
91	4838300	24years	2	1	0	1	26/01/2018	02/11/2018	30wks+5days	03/04/2018	8wks+6 days (20mm)	7.6cm	29.2cm	26.1cm	5.7cm	4cm	31.5
92	4648195	23yrs	2	1	0	1	30/09/2018	07/07/2018	32wk+2days	07/07/2018	12wk+6days(65mm)	8.1cm	29.7cm	26.9cm	6.2cm	4.2cm	33
93	3975849	24yrs	2	1	0	1	17/10/2018	24/07/2018	34wk	24/07/2018	9WKS(22MM)	8.5cm	31.5cm	28.7cm	6.5cm	4.08cm	34.5
94	4714397	26yrs	1	0	0	0	26/08/2018	02/06/2018	27wk+4days	07/06/2018	9wk+4days(28mm)	6.2cm	23.7cm	20.6cm	4.2cm	3.0cm	27.2
95	4728588	27yrs	2	1	0	1	17/11/2018	24/08/2018	30wk+3dayd	24/08/2018	9WK(22MM)	7.37cm	28.1cm	25.4cm	6.14cm	3.56cm	30.4
96	4606670	21yrs	1	0	0	0	09/10/2017	16/07/2018	26wk+4days	16/07/2018	9WK(22MM)	6.9cm	24.8cm	20.7cm	4.7cm	3.16cm	27
97	4788144	21yrs	1	0	0	0	18/10/2017	25/07/2018	34wk+5days	25/07/2018	9wk(22mm)	8.85cm	30.2cm	29.9cm	6.6cm	4.6cm	33.1
98	4135171	24yrs	2	1	0	1	05/07/2017	11/04/2018	31wk+5days	11/04/2018	12wk(55mm)	7.7cm	28.4cm	24.4cm	6.2cm	3.73cm	32.2
99	4850534	22yrs	1	0	0	0	28/11/2017	04/09/2018	28wk+5days	10/09/2018	9wk+3days(23mm)	7.5cm	27.5cm	23.8cm	5.8cm	3.3cm	28.4
100	3938838	32yrs	3	1	1	1	05/12/2017	11/09/2018	28wk+2days	11/09/2018	9wk+4days(30.3mm)	7.4cm	27.6cm	23.9cm	5.8cm	3.6cm	28.2
101	3712776	19yrs	2	1	0	1	30/11/2017	06/09/2018	29wk	06/09/2018	12k(53.2mm)	7.6cm	28cm	24.2cm	5.9cm	3.0cm	29.2
102	4772065	22yrs	1	0	0	0	27/09/2018	04/07/2018	35wk+5days	06/07/2018	8wks(19mm)	8.8cm	30.8cm	29.4cm	6.46cm	3.41cm	36.1
103	4721330	28yrs	1	0	0	0	02/12/2017	09/09/2018	27wk+2days	14/09/2018	11wk+6days(50mm)	6.89cm	24.8cm	21.1cm	5.36cm	2.86cm	28
104	4747013	27yrs	1	0	0	0	08/12/2017	15/09/2018	27wk	15/09/2018	13wk(75mm)	9.20cm	31.9cm	29.9cm	6.8cm	2.82cm	29
105	4135171	24yrs	2	1	0	1	18/05/2018	22/02/2018	29wk+5day	03/03/2018	8WK+4DAY(22MM)	6.8cm	25cm	24.3cm	5.9cm	3.8cm	28.6
106	4747538	22yrs	1	0	0	0	16/10/2017	23/07/2018	29wk+5days	08/09/2018	11wk+6day(43mm)	7.45cm	27.02cm	23.1cm	5.43cm	3.63cm	29.3
107	4273481	23yrs	1	0	0	0	29/10/2017	05/08/2018	34wk+4days	05/08/2018	9wk+3day(24mm)	7.7cm	29.cm	27.7cm	6.2cm	4.2cm	33.2
108	4035041	28yrs	1	0	0	0	08/11/2018	15/08/2018	29wk+2day	15/08/2018	6wk+4day(6mm)	4.85cm	16cm	13.9cm	2.85cm	3.25cm	29
109	4760616	23yrs	2	1	0	1	12/08/2017	15/05/2018	28wk	19/05/2018	11wk+days(48mm0	6.6cm	24.7cm	24.7cm	4.5cm	3.2cm	32.2
110	4774727	22yrs	2	1	0	1	26/09/2017	03/07/2018	35wk+5days	04/07/2018	9wks(24mm)	9.45cm	30.7cm	29.9cm	6.88cm	4.03cm	36.1
111	4508012	21yrs	2	1	0	1	02/07/2017	08/04/2018	26wk+3days	08/04/2018	11wk(43mm)	7cm	24.5cm	20.9cm	4.8cm	3cm	26.1
112	4590622	24yrs	1	0	0	0	14/03/2018	19/12/2018	36wk	19/12/2018	13wk+2day(76mm)	9cm	31.5cm	31cm	5.6cm	3.76cm	36.6
113	4845053	22yrs	2	1	0	1	03/11/2017	10/08/2018	31wk+3days	10/08/2018	9wk+2day(25mm)	4.4cm	2.9cm	26.4cm	6.13cm	3.08cm	32.1
114	4765917	25yrs	1	0	0	0	06/11/2017	13/08/2018	26wk	13/08/2018	9wk(22mm)	6.2cm	22.8cm	20.1cm	4.6cm	2.9cm	26.1
115	4905654	24yrs	1	0	0	0	31/05/2018	07/03/2019	30wk	07/03/2019	12wk(55mm)	7.5cm	27.3cm	24.8cm	5.6cm	3.25cm	30.2
116	2988017	19yrs	2	1	0	1	26/06/2017	02/04/2018	27wk	02/04/2018	10wk+4day(36mm)	6.8cm	25.7cm	22.8cm	4.9cm	2.65cm	27.1
117	4013551	24yrs	1	0	0	0	14/11/2017	21/08/2018	29wk+4day	13/08/2018	13wk(53mm)	7.8cm	29.4cm	23.6cm	5.5cm	4.21cm	30.5
118	4640626	21yrs	1	0	0	0	13/10/2017	20/07/2018	26wk+4days	17/08/2018	75mm(13wk)	6.3cm	24.1cm	20.4cm	4.9cm	2.87cm	26.1
119	2312562	24yrs	2	1	0	1	18/09/2017	25/06/2018	30wk	25/06/2018	11wk+1day(43mm)	7.1cm	27.6cm	24.8cm	5.6cm	3.6cm	31
120	4829618	20yr	1	0	0	0	14/11/2017	21/08/2018	26wk+4days	21/08/2018	13wk(73mm0	6.5cm	25.9cm	21.5cm	4.8cm	3.2cm	26.1
121	4705077	25yrs	1	0	0	0	09/12/2017	15/09/2018	26WK	15/09/2018	12WK+4DAY(64MM)	6.36CM	23.4CM	19.9CM	4.96CM	2.73CM	25.1
122	4689852	21yrs	2	1	1	1	22/09/2017	29/06/2018	26wk+6day	29/06/2018	11wk+6day(61mm)	6.4cm	26cm	22.5cm	5.2cm	3.09cm	26.1
123	4783163	24yrs	1	0	0	0	18/11/2017	25/08/2018	27wk	25/08/2018	10wk+6day(44mm)	6.6cm	22.9cm	21.3cm	5.1cm	2.6cm	28
124	4609896	22yrs	1	0	0	0	09/09/2017	16/06/2018	27wk+6days	26/06/2018	11wk+6day(50mm)	6.8cm	25.4cm	22.5cm	5cm	3.4cm	28.1
125	4697192	24yrs	2	1	0	1	04/12/2017	11/09/2018	26wk	11/09/2018	9wk(23mm)	5.58cm	23.4cm	20.9cm	5cm	2.86cm	26.1
126	4583049	35yrs	5	4	0	0	16/08/2018	23/05/2018	26wk+5days	23/05/2018	13wk(70mm)	5.7cm	21.03cm	17.9cm	3.9cm	2.4cm	27
127	4498929	25yrs	2	1	0	1	12/05/2017	16/02/2018	27wk+5day	01/03/2018	6wk+6days(13mm)	6.9cm	25.3cm	22.2cm	5.08cm	3.12cm	28.6
128	5023259	24yrs	1	0	0	0	26/03/2018	31/12/2018	35wk+5day	31/12/2018	8wk+3day(14mm)	6.8cm	29.6cm	29.9cm	6.8cm	3.83cm	35.3

129	4756428	21yr	1	0	0	0	20/11/2017	27/08/2018	26wk+1day	27/08/2018	9wk+1day(16mm)	6.6cm	24.5cm	21.6cm	4.6cm	2.8cm	26.6
130	4140310	24yrs	1	0	0	0	20/04/2018	25/01/2019	32wk+4days	25/01/2019	10wk(29mm)	8cm	29.3cm	27cm	6.3cm	3.46cm	34.2
131	4496007	21yr	2	1	0	1	11/06/2017	18/03/2018	36wk	18/03/2018	74mm(11wk)	7.9cm	30.1cm	28.1cm	6cm	4.02cm	36.2
132	4684972	20yr	1	0	0	0	15/10/2017	22/07/2018	26wk+1day	22/07/2018	24mm(9wk+6day)	6.6cm	23.7cm	21.2cm	4.7cm	2.7cm	26.4
133	4750311	21yr	1	0	0	0	10//11/17	17/08/2018	28wk+6day	17/08/2018	13wk+3day(59mm)	6.7cm	24.9cm	23.8cm	5.2cm	3.4cm	28.4
134	5048095	19yrs	1	0	0	0	16/04/2018	21/01/2019	36wk	21/01/2019	10wk(24mm)	8.9cm	32.4cm	29.4cm	7cm	3.65cm	37.4
135	4962904	22yrs	1	0	0	0	02/05/2018	06/02/2019	33wk	06/02/2019	8wk(13mm)	8.1cm	30.6cm	28.3cm	6.4cm	3.58cm	34.4
136	4540089	24yrs	1	0	0	0	20/08/2017	27/05/2018	28wk+2day	27/05/2018	13wk+2(72mm)	7cm	26.5cm	22.1cm	5.4cm	3.3cm	28
137	5040249	20yrs	2	1	0	1	09/04/2018	14/01/2019	35wk+5day	14/01/2019	9wk(19mm)	8.1cm	26.4cm	25.5cm	5.5cm	3.83cm	31.1
138	3581191	24yrs	1	0	0	0	16/06/2017	23/03/2018	28wk+2days	08/05/2018	9wk+2day(25mm)	7CM	25.3CM	24.1CM	5CM	3.64CM	28
139	4620702	22yrs	1	0	0	0	22/05/2018	26/02/2018	32wk+1day	13/03/2019	14WK(79MM)	8.9CM	314MM	29.8CM	5.6CM	3.63CM	32.1
140	4457955	24yrs	1	0	0	0	13/05/2017	17/02/2018	34wk	01/03/2018	9wk(22mm0	8.3m	30cm	27.6cm	6.4cm	3.7cm	34
141	4578423	24yrs	1	0	0	0	27/05/2018	03/03/2018	33wk+5days	03/03/2018	11wk+5day(48mm)	8.2cm	29.9cm	28cm	6.4cm	3.55cm	33.2
142	4480692	23yrs	1	0	0	0	07/06/2018	14/03/2018	32wk+2days	14/03/2018	9wk+4day(25mm)	8.2cm	28.6cm	26.8cm	6.1cm	3.56CM	32
143	4630406	26yrs	1	0	0	0	07/07/2018	13/04/2018	30wk+6day	13/04/2018	10wk+6day(39mm)	6.7cm	26.3cm	22.3cm	5.3cm	2.95cm	27.4
144	4639731	22yrs	2	1	0	1	07/07/2018	13/04/2018	32wk+2days	15/05/2018	8wk(13mm0	8cm	28.9cm	26.1cm	5.9cm	3.81cm	31.5
145	4537499	24yrs	2	1	0	1	22/07/2018	28/04/2018	33wk+5day	28/04/2018	6wk+day(5mm)	8.3cm	29.7cm	28.1cm	6.2cm	3.41cm	33.1
146	5000350	21yrs	2	1	0	1	14/06/2018	21/03/2019	28wk+5day	21/03/2018	10wk+3day(31mm)	6.6cm	24.1cm	24cm	5cm	2.82cm	28.6
147	4463994	24yrs	2	1	0	1	08/06/2018	15/03/2018	33wk+6day	15/03/2018	7wk+6day(15mm)	8.2cm	30cm	29.2cm	6.4cm	3.48cm	33.4
148	4436364	21yrs	1	0	0	0	23/05/2017	27/02/2018	36wk	27/02/2018	13wk(61mm)	8.4cm	31.1cm	30.5cm	6.8cm	3.98cm	35.3
149	4600023	22yrs	2	1	0	1	13/06/2017	20/03/2018	30wk+5day	04/04/2018	9wk+1day(24mm)	8.1cm	29.4cm	27.9cm	5.6cm	3.15cm	30.5
150	4651002	22yrs	2	1	0	1	22/05/2017	26/02/2018	36wk	26/02/2018	6wk+2da(3mm)	87cm	30.2cm	29.9cm	7.1cm	4.10cm	35.5
151	4630831	24yrs	2	1	0	1	01/05/2017	05/02/2018	34k+3day	08/03/2018	13wk(6mm)	8.5cm	30.8cm	30.4cm	6.8cm	3.61cm	34.2
152	4639817	22yrs	1	0	0	0	16/07/2017	22/04/2018	26wk	05/05/2018	6wk+5day(5mm)	6.5cm	23.7cm	20.4cm	4.8cm	2.89cm	26
153	4455965	21yrs	1	0	0	0	11/05/2017	15/02/2018	36wk	21/02/2018	10wk(32mm)	8.7cm	29.7cm	32cm	6.7cm	3.89cm	36
154	4463935	22yrs	1	0	0	0	26/05/2017	02/03/2018	34wk+5day	02/02/2018	10wk(30mm)	8.3cm	29.3cm	29.3cm	6.6cm	3.50cm	34.2
155	4446667	24yrs	1	0	0	0	26/05/2017	02/03/2018	34+5day	02/03/2018	11wk(45mm)	8.6cm	30.1cm	29.3cm	6.4cm	4.02cm	34.2
156	3903853	24yrs	2	0	1	0	unknown	27/02/2018	35wk+1day	27/02/2018	10wk(30mm0	8.1cm	30.2cm	29.6cm	6.7cm	3.70cm	35.1
157	2495948	23yrs	2	1	0	1	27/05/2017	03/03/2018	34+4wk	03/03/2018	9wk+4day(31mm)	8.7cm	30.5cm	29.9cm	6.3cm	3.81cm	34.4
158	4475743	22yrs	2	1	0	1	15/05/2017	19/02/2018	34+1wk	17/03/2018	10wk+5day(37mm)	8cm	29.5cm	29.7cm	6.6cm	3.56cm	34.1
159	4475816	25yrs	1	0	0	0	04/05/2017	08/02/2018	35wk+6day	25/02/2018	13wk+6day(74mm)	8.4cm	31.3cm	29.4cm	6.9cm	3.47cm	35.6
160	4448316	21yrs	1	0	0	0	04/05/2017	08/02/2018	35wk+2day	01/03/2018	12wk(36mm)	8.4cm	29.6cm	30.6cm	6.6cm	3.76cm	35.2
161	4558104	23yrs	1	0	0	0	02/08/2017	09/05/2018	26+6day	09/05/2018	12wk+6day(61mm)	6.2cm	24.cm	21.7cm	5cm	2.71cm	26.6
162	4550023	22yrs	1	0	0	0	29/08/2018	05/06/2018	32wk+3days	05/06/2018	11wk(43mm)	7.8cm	30.8cm	28cm	6cm	3.27cm	32.6
163	4559648	24yrs	1	0	0	0	02/06/2017	09/03/2018	33wk+4day	09/03/2018	8wk+5day(28mm)	8.3cm	30.6cm	28.8cm	6.8cm	3.60cm	34.4
164	4566347	27yrs	1	0	0	0	24/06/2017	31/03/2018	29wk+3day	31/03/2018	11wk+4day(23mm)	7.3cm	26.3cm	25.4cm	5.6cm	3.93cm	30.3
165	4606713	20yr	4	2	0	2	10/05/2017	14/02/2018	29wk+5ay	29/03/2018	10wk(22mm0	7.8cm	29.4cm	25.9cm	5.7cm	3.95cm	30
166	4481732	28yrs	1	0	0	0	17/05/2018	21/02/2018	33wk+5day	02/03/2018	6wk(2mm)	6.2cm	28.7cm	28.8cm	6.2cm	3.73cm	33.5
167	4498929	23yrs	2	1	0	1	12/05/2018	16/02/2018	35wk+4day	16/02/2018	8wk+3day(15mm)	9.1cm	31.2cm	28.2cm	6.6cm	4.21cm	35.6
168	4612651	24yrs	2	1	0	1	16/06/2018	23/03/2018	28wk+5days	06/04/2018	8wk+6day(20mm)	7.6cm	27.1cm	23.9cm	5.5cm	3.22cm	28.5
169	4635117	25yrs	1	0	0	0	19/08/2017	26/05/2018	34WK+6DAYS	26/05/2018	11wk+2day(41mm	8.1cm	30.8cm	27.4cm	6.6cm	3.55cm	33.5
170	4654464	20yrs	2	1	0	1	14/10/2017	21/07/2018	33wk+4day	21/07/2018	14wk(76mm)	8.7cn	31.3cm	27.9cn	6.3cm	3.60cm	34.4
171	4528387	24yrs	2	1	0	1	18/06/2018	25/03/2018	30wk+6day	25/03/2018	12wk+3day(56mm	6.5cm	23.3cm 22.3cm 4.9cm	22.3cm	4.9cm	3.04cm	26.1
172	4627950	24yrs	1	0	0	0	29/07/2018	05/05/2018	28wk+1day	09/04/2018	10wk(20mm0	7cm	25.5cm	22.3cm	5.4cm	3.05cm	28

173	4617522	26yrs	1	0	0	0	22/06/2017	29/03/2018	35wk+2day	24/02/2018	10wk(22mm0	9.2cm	29.1cm	30.9cm	6.9cm	3.67cm	35.2
174	3121495	22yrs	1	0	0	0	11/09/2017	18/06/2018	27wk+3days	18/06/2018	13wk(70mm)	6.9cm	26cm	22.8cm	5.2cm	3.06cm	27.4
175	4565954	21yrs	1	0	0	0	10/06/2018	17/03/2017	35wk+2day	17/03/2018	13wk(31mm0)	8.7cm	29.4cm	28.4cm	6.7cm	3.73cm	34.2
176	4987637	21yrs	1	0	0	0	11/04/2018	16/01/2019	33wk+1day	16/01/2019	13wk(66mm)	7.8cm	28.3cm	29.2cm	6.2cm	3.83cm	33
177	5000972	22yrs	1	0	0	0	04/04/2018	09/01/2019	36wk	09/01/2019	13wk+6day(76mm)	9.2cm	30.9cm	27.6cm	7cm	3.46cm	36.6
178	4750391	24yrs	2	1	0	1	25/03/2018	30/12/2018	35wk+4day	30/12/2018	12wk+4day(56mm)	8.6cm	29.3cm	31.6cm	6.9cm	3.46cm	36.6
179	4750805	26yrs	1	0	0	0	09/03/2018	03/01/2019	34wk+6wk	03/01/2019	10wk+4day(32mm)	8.3cm	23.2cm	23.1cm	5.8cm	3.52cm	34
180	4936836	23yrs	1	0	0	0	01/04/2018	06/01/2019	34wk+3day	12/01/2019	13wk(66mm)	8.3cm	31cm	29.2cm	6.6cm	3.61cm	34.3
181	4483963	24yrs	2	1	0	0	09/05/2017	13/02/2018	35wk+2day	13/02/2018	6wk+2day(2mm)	8.5cm	31.2cm	30cm	6.9cm	3.95cm	36
182	5467456	22yrs	2	0	1	0	10/05/2017	14/02/2018	35wk+2day	14/02/2018	12wk(52mm)	7.7cm	27cm	29.1cm	6.6cm	4.03cm	35
183	4635080	22yrs	1	0	0	0	29/09/2018	06/07/2018	31wk	06/07/2018	13wk(70mm)	8.3cm	27.9cm	26.8cm	6.1cm	3.03cm	32.6
184	4637915	21yrs	1	0	0	0	11/05/2017	15/02/2018	34WK+6DAYS	15/02/2018	12wk+3day(56mm)	8.6cm	30.5cm	28.3cm	6.6cm	4.69cm	35
185	4517990	22yrs	1	0	0	0	15/05/2017	19/02/2018	34wk+2day	19/02/2018	13wk(76mm)	8.5cm	30.2cm	26.3cm	6.1cm	3.51cm	33
186	4628828	26yrs	1	0	0	0	20/07/2017	26/04/2018	34wk+2day	26/04/2018	11wk(26mm)	8.8cm	30.6cm	28cm	6.4cm	3.97cm	35
187	4620767	26yrs	1	0	0	0	23/05/2017	27/02/2018	31wk+2day	12/03/2018	14wk(76mm)	8.1cm	28.4cm	24.8cm	6.1cm	3.05cm	31.2
188	4638334	23yrs	1	0	0	0	10/05/2017	14/02/2018	35wk	14/02/2018	6wk+1day(2mm)	8.5cm	31cm	29.8cm	6.3cm	3.55cm	34.3
189	4511325	22yrs	1	0	0	0	03/05/2017	07/02/2018	34wk+2day	18/02/2018	7wk(10mm)	8.2cm	30.4cm	29.2cm	6.1cm	3.88cm	34.2
190	4504381	24yrs	1	0	0	0	05/06/2017	12/03/2018	31wk	12/03/2018	7wk(10mm)	7.9cm	30cm	26.1cm	5.9cm	3.87cm	30.6
191	4591644	28yrs	2	1	0	1	19/05/2017	23/02/2018	3wk+3day	09/03/2018	13wk(73mm)	7.9cm	30.3cm	28cm	6.2cm	3.56cm	31.3
192	4575476	24yrs	1	0	0	0	25/05/2017	01/03/2018	31wk+1day	11/03/2018	8wk(14mm)	8.3cm	31.6cm	26.3cm	6cm	3.18cm	31.1
193	4388956	26yrs	2	1	0	1	15/05/2017	19/02/2018	34wk	19/02/2018	7wk(10mm)	8.4cm	31.8cm	30cm	6.7cm	3.39cm	36.6
194	3407919	24yrs	1	0	0	0	05/05/2018	09/02/2018	35wk+3days	09/02/2018	7wk(10mm)	8.8cm	33.1cm	31.5cm	6.2cm	3.85cm	37.1
195	4480656	22yrs	1	0	0	0	20/06/2018	27/03/2018	34wk+3day	27/03/2018	7wk+1day(10mm)	8cm	31.3cm	29cm	6.5cm	3.1cm	33.6
196	4654375	24yrs	1	0	0	0	22/06/2017	29/03/2018	28wk+2days	29/03/2018	7wk+6day(18mm)	7.3cm	26.8cm	23.5cm	5.4cm	3.03cm	28.4
197	2758852	19yrs	1	0	0	0	04/05/2017	08/02/2018	34wk+3day	13/02/2018	8wk(14mm)	8.2cm	29.6cm	28.7cm	6.6cm	3.46cm	34.3
198	4483770	22yrs	1	0	0	0	13/06/2017	20/03/2018	34+6wk	09/02/2018	14wk(76mm)	8.8cm	30.8cm	31.5cm	6.5cm	3.66cm	34.6
199	4587275	24yrs	2	1	0	1	20/06/2017	27/03/2018	34wk+2day	27/03/2018	11wk+1day(38mm)	8.3cm	30cm	28.9cm	6.7cm	3.00cm	34.1
200	4797436	22yrs	1	0	0	0	26/12/2017	02/10/2018	26wk+4day	02/10/2018	10wk+2day40mm)	6.6cm	24cm	22.cm	4.5cm	2.89cm	27
201	4642660	25yrs	1	0	0	0	03/07/2017	09/04/2018	26wk+3days	03/07/2017	10wk(30mm)	6.6cm	24.4cm	20.3cm	5.1cm	2.99cm	26.2
202	4518085	25yrs	1	0	0	0	28/04/2017	02/02/2018	33wk+6day	15/02/2018	9wk+6day(27mm)	8.5cm	30.2cm	27.2cm	6.3cm	3.49cm	33.6
203	4549316	23yrs	2	1	0	1	08/05/2018	12/02/2018	34wk+1day	12/02/2018	9wk(31mm)	8.1cm	30.9cm	30cm	6.3cm	3.81cm	35.2
204	4436203	25yrs	3	2	0	2	09/05/2017	13/02/2018	34wk	13/02/2018	13wk(67mm)	8.7cm	32.2cm	29.5cm	6.3cm	3.50cm	35.4
205	4437559	28yrs	4	2	0	2	12/06/2017	19/03/2018	33wk+6day	15/02/2018	10wk+6day(39mm)	8.7cm	29.4cm	26.7cm	6.2cm	3.48cm	33.6
206	4588914	21yrs	2	0	1	0	30/05/2017	06/03/2018	31wk	06/03/2018	9wk(30mm)	7.3cm	28.4cm	26.2cm	6.1cm	3.23cm	30.6
207	4570384	22yrs	1	0	0	0	19/05/2017	23/02/2018	33wk+6day	23/02/2018	12wk+3day(54mm)	8.4cm	29.8cm	28.9cm	6.4cm	3.81cm	33.5
208	4463176	24yrs	2	0	1	0	11/05/2017	15/02/2018	35wk+1day	15/02/2018	12wk+5day(53mm)	8.4cm	31.5cm	29.1cm	6cm	3.61cm	34
209	4490281	22yrs	1	0	0	0	24/04/2017	29/01/2018	34wk+6dayS	17/02/2018	7wk+4day(10mm)	8.5cm	31.3cm	28.3cm	6.5cm	3.85cm	34.6
210	4493319	22yrs	2	0	1	0	25/05/2017	01/03/2018	32+1wk	08/03/2018	7wk+2(8mm)	7.7cm	29.6cm	25.7cm	5.7cm	3.79cm	32.1
211	4576750	27yrs	4	2	0	2	11/05/2017	15/02/2018	35wk+1day	15/02/2018	7wk(10mm)	8.2cm	31.2cm	30cm	6.9cm	3.75cm	36.2
212	4600023	22yrs	2	1	0	1	13/06/2017	20/03/2018	26wk+5days	31/08/2017	9wk+2day(24mm	6.8cm	23.2cm	22.4cm	5.1cm	2.62cm	26.5
213	4490206	21yrs	1	0	0	0	06/05/2017	10/02/2018	35wk+6day	10/02/2018	12wk(50mm)	8.9cm	32.9cm	31cm	6.6cm	3.55cm	36.4
214	4600689	23yrs	1	0	0	0	02/07/2017	08/04/2018	26wk+1day	08/04/2018	12wk+1day(48mm) 7.2cm	6.4cm	22cm	19.9cm	4.7cm	2.66cm	26
215	4600218	29yrs	4	2	0	2	29/04/2017	03/02/2018	35wk+2day	03/02/2018	9wk(30mm)	8.1cm	30.4cm	28.4cm	6.5cm	3.99cm	35.6
216	4938468	24yrs	2	1	0	1	16/02/2018	23/11/2018	32wk+5days	23/11/2018	10wk+2da(26mm)	7.7cm	28.8cm	26.5cm	5.9cm	3.39cm	31.5

217	4766418	21yrs	1	0	0	0	04/02/2018	11/11/2018	34wk+3day	11/11/2018	9wk(30mm)	8.4cm	29.6cm	27.9cm	6.5cm	3.42cm	33.4
218	4622134	22yrs	2	1	0	1	not known	16/10/2018	26wks	16/10/2018	11wk+1day(44mm)	6.4cm	23.6cm	21.6cm	4.4cm	2.80cm	26.6
219	4867059	28yrs	2	1	0	1	21/04/2018	20/01/2019	34wk+4day	20/11/2018	10wk+4day(40mm)	8.4cm	30.5cm	30.5cm	6.4cm	3.43cm	34.1
220	4946408	21yrs	2	1	0	1	01/02/2018	08/11/2018	34wk+2day	08/11/2018	12wk+6day(70mm)	8.7cm	30.4cm	29.9cm	6.6cm	3.33cm	34.5
221	4958429	22yrs	1	0	0	0	03/02/2018	10/11/2018	34wk+4days	10/11/2018	10wk+2day(22mm)	7.7cm	28.4cm	28.7cm	6.5cm	3.43cm	33.3
222	4827795	21yrs	1	0	0	0	06/02/2018	13/11/2018	33wk+6day	13/11/2018	10wk(22mm)	9.1cm	30.7cm	30.4cm	7.2cm	3.48cm	37.6
223	4861305	22yrs	2	0	1	0	03/02/2018	10/11/2018	34wk+2days	10/11/2018	8wk+3day(19mm)	8.2cm	28.2cm	28.4cm	6.6cm	3.75cm	33
224	4892469	20yr	1	0	0	0	27/04/2018	01/02/2019	31wk+3day	01/02/2018	8wk(20mm)	8.1cm	29.6cm	25.6cm	6.1cm	3.21cm	32
225	3658129	27yrs	1	0	0	0	05/02/2018	12/11/2018	34wk	12/11/2018	10wk(24mm)	8.9cm	32.4cm	30.8cm	7cm	3.55cm	37
226	4351517	26yrs	1	0	0	0	23/01/2018	30/10/2018	34wk+1day	03/10/2018	13wk65mm)	8.4cm	29.7cm	29cm	6.4cm	4.13cm	34.2
227	4847594	21yrs	1	0	0	0	01/03/2018	06/12/2018	29wk+6days	06/12/2018	12wk+2day(56mm)	7.4cm	27.8cm	25.1cm	5.8cm	3.73cm	30.1
228	4978392	22yrs	1	0	0	0	16/02/2018	23/11/2018	35wk+5days	23/11/2018	13wk(60mm)	9cm	30.7cm	26.9cm	6.5cm	3.73cm	35..6
229	3850472	21yrs	2	1	0	1	05/03/2018	10/12/2018	33wk+3days	10/12/2018	14wk(75mm)	8.2cm	29.8cm	28cm	6.3cm	3.49cm	33.1
230	4921293	22ys	1	0	0	0	16/02/2018	23/11/2018	35wk+5days	23/11/2018	10wk+5day(45mm)	8.6cm	29.8cm	29cm	6.9m	3.95cm	34.6
231	4966160	21yrs	2	1	0	1	13/03/2018	18/12/2018	32wk+2days	18/12/2018	11wk+3day(43mm)	7.2cm	27.9cm	27.4cm	6cm	3.86cm	31.4
232	4987213	20yrs	2	1	0	1	27/03/2018	01/01/2019	29wk+6days	01/01/2019	13wk(70mm)	6.9cm	25cm	22.7cm	5.7cm	2.96cm	28
233	4961777	24yrs	2	1	0	1	24/02/2018	01/12/2018	33wk+4days	01/12/2018	11wk+2day(39mm)	8cm	29.7cm	28.1cm	6.1cm	3.65cm	32.2
234	4932915	26yrs	2	1	0	1	01/02/2018	08/11/2018	34wk	08/11/2018	8wk+5day(26mm0	8.8cm	30.5cm	29.2cm	6.6cm	3.84cm	35.3
235	4982919	21yrs	2	1	0	1	16/02/2018	23/11/2018	35wk+1day	23/11/2018	12wk(50mm)	8.8cm	31.2cm	29.2cm	6.5cm	3.62cm	35.1
236	4994908	22yrs	2	1	0	1	12/02/2018	19/11/2018	35wk+3days	19/11/2018	8wk(13mm0	8.2cm	28.8cm	20.9cm	6.5cm	3.65cm	34.6
237	4949704	21yrs	1	0	0	0	08/04/2018	13/01/2019	27wk+6days	13/01/2019	7wk+3day(11mm)	7.8cm	25.8cm	23.4cm	5.3cm	2.95cm	28.1
238	4978913	22yrs	1	0	0	0	01/03/2018	06/12/2018	32WK+6DAYS	06/12/2018	13wk(64mm)	8.1cm	29.5cm	25.4cm	6.2cm	3.4cm	31.6
239	4818044	22yrs	1	0	0	0	16/02/2018	23/11/2018	35wk+5days	16/11/2018	10wk+6day(39mm0	8.5cm	29.7cm	29.6cm	6.8cm	3.86cm	34.5
240	4847565	24yrs	1	0	0	0	15/02/2018	23/11/2018	26wk+1day	23/11/2018	11wk+3day(50mm0	6.5cm	23.3cm	20.5cm	4.4cm	3.59cm	25.3
241	4873803	22yrs	2	1	0	1	19/02/2018	16/11/2018	29wk+2day	26/11/2018	12wk(52mm0	7.4cm	28cm	24.6cm	5.8cm	3.74cm	29.6
242	4863087	26yrs	1	0	0	0	10/02/2018	17/11/2018	35wk+3days	17/11/2018	12wk+5day(51mm0	8.6cm	31.4cm	31.4cm	6.7cm	3.77cm	34.6
243	4932114	24yrs	2	1	0	1	not known	30/11/2018	33wk+4day	30/11/2018	12wk(50mm0	8.1cm	29.5cm	29.7cm	6.5cm	3.75cm	33.4
244	4791711	21yrs	2	1	0	1	24/02/2018	01/12/2018	34wk+1day	23/11/2018	14wk(80mm)	8.9cm	32.9cm	29.5cm	6.4cm	3.66cm	36.1
245	3671907	22yrs	3	2	0	2	31/10/2018	07/11/2018	35wk+2day	15/11/2018	9wk+5day(28mm0	7.8cm	31cm	28.4cm	6.5cm	3.87cm	35.2
246	4943696	28yrs	2	1	0	1	10/02/2018	17/11/2018	35wk+2day	17/11/2018	12wk+3day(48mm)	8.5cm	28.2cm	27.3cm	6.4cm	3.70cm	33.2
247	4860933	24yrs	1	0	0	0	10/02/2018	17/11/2018	26wk	17/11/2018	13wk(68mm)	6.2m	23.1cm	21cm	4.7cm	3.79cm	25.2
248	4842683	21yrs	1	0	0	0	15/02/2018	22/11/2018	34wk+5day	22/11/2018	11wk+4day(50mm)	8cm	30.3cm	29.1cm	6.2cm	3.78cm	33.1
249	4918064	25yrs	1	0	0	0	06/03/2018	11/12/2018	31wk+6day	11/12/2018	12wk+4day(65mm0	8.2cm	29.9cm	26.4cm	6.9cm	3.34cm	33.4
250	4927770	25yrs	2	1	0	1	10/02/2018	17/11/2018	35wk+3days	17/11/2018	12wk+4day(50mm0	8.4cm	30.7cm	30cm	6.5cm	3.80cm	34.1
251	4955532	21yrs	2	1	0	1	05/02/2018	12/11/2018	34wk+5day	12/11/2018	12wk+6day(56mm)	8.7cm	31cm	30cm	6.3cm	3.84cm	34.5
252	4925705	27yrs	2	1	0	1	27/02/2018	04/12/2018	34wk+3day	04/12/2018	8wk(15mm)	8.5cm	28.5cm	26.8cm	6cm	3.34cm	31.3
253	4822651	22yrs	2	1	0	1	01/02/2018	08/11/2018	32wk+4days	08/11/2018	10wk+5day(49mm)	7.8cm	30.4cm	27.6cm	6.6cm	3.65cm	33.4
254	4822652	23yrs	2	1	0	1	13/01/2018	20/10/2018	35wk	31/10/2018	12wk+6day(60mm0	8.7cm	30.7cm	27.4cm	6.6cm	3.89cm	34.2
255	4977026	24yrs	1	0	0	0	28/10/2018	04/11/2018	35wk+5days	12/11/2018	7wk+2day(8mm)	8.5cm	29.5cm	30.1cm	6.6cm	3.65cm	35.5
256	4763877	28yrs	1	0	0	0	27/01/2018	03/11/2018	35wk+6day	03/11/2018	12wk(45mm)	8.8cm	30.3cm	28.7cm	6.4cm	3.84cm	34.4
257	4882212	23yrs	2	1	0	1	13/01/2018	20/10/2018	35wk+2day	07/11/2018	10wk(31mm)	8.6cm	30.5cm	28.7cm	6.6cm	3.67cm	35.2
258	4748891	24yrs	1	0	0	0	03/02/2018	10/11/2018	35wk	10/11/2018	10wk(30mm)	9.2cm	31.6cm	28.6cm	6.7cm	4.29cm	36.2
259	4956988	24yrs	3	2	0	2	09/02/2018	16/11/2018	35wk	16/11/2018	8wk(16mm0	8.3cm	30cm	28cm	6.8cm	3.78cm	34.3
260	2125004	26yrs	2	0	1	0	13/02/2018	20/11/2018	33wk+4day	20/11/2018	10wk+6day(43mm)	8.3cm	29.9cm	30cm	6.5cm	3.75cm	34

261	4876711	24yrs	1	0	0	0	08/03/2018	13/12/2018	36wks	25/12/2018	12wk+6day(62mm)	8.4cm	30.4cm	30.6cm	6.8cm	3.82cm	34.6
262	4812840	20yrs	1	0	0	0	29/03/2018	03/01/2019	34wk+5day	03/01/2019	14wk+4day(78mm)	9.3m	32.3cm	31.6cm	6.6cm	3.49cm	38
263	5070227	24yrs	1	0	0	0	13/06/2018	20/03/2019	27wk+5day	20/03/2018	10wk(18mm)	7.4cm	27.2cm	14.6cm	5.5cm	3.34cm	29
264	5025428	19yrs	1	0	0	0	30/05/2018	06/03/2019	28wk+3day	06/03/2018	8wk+6day(22mm)	7.4cm	27.4cm	22.7cm	5cm	3.26cm	28.2
265	4969645	23yrs	1	0	0	0	09/05/2017	13/02/2017	33wk+2day	13/02/2018	9wk(18mm0	85cm	29.6cm	28.3cm	6.3cm	3.6CM	34
266	3673581	23yrs	2	1	0	1	20/04/2018	25/01/2019	36wk	25/01/2019	12wk+1day(59mm)	9.1cm	31.8cm	33.7cm	6.5cm	3.96cm	37
267	5031029	24yrs	2	1	0	1	21/04/2018	26/01/2019	35wk+6day	26/01/2019	13wk+3day(75mm)	8.6cm	31cm	30.6cm	6.5cm	3.67cm	35.4
268	4871024	28yrs	1	0	0	0	27/04/2018	01/02/2019	34WK+6DAYS	01/02/2019	9wk+6day(31mm)	8.5cm	30.9cm	29.2cm	6.6cm	3.62cm	35
269	4886874	21yrs	1	0	0	0	08/05/2018	12/02/2019	33wk+1day	12/02/2019	10wk+1day(33mm)	8cm	28.8cm	27.9cm	6.1cm	3.46cm	32.6
270	4948083	26yrs	1	0	0	0	01/05/2018	05/02/2019	32WK+6DAYS	15/02/2018	7wk+6day(11mm)	8cm	29.7cm	28.7cm	6.2cm	3.58cm	32.6
271	4928814	24yrs	1	0	0	0	23/04/2018	28/01/2019	34wk+4days	02/02/2019	12wk(52mm)	8.5cm	29.4cm	28.6cm	6.7cm	3.60cm	34.6
272	4994303	26yrs	2	1	0	1	20/09/2018	25/01/2019	32WK+6DAYS	14/02/2019	13wk(75mm)	7.8cm	28.1cm	25.2cm	6cm	3.32cm	32
273	4892810	21yrs	1	0	0	0	12/05/2018	16/02/2019	32wk+2days	16/02/2019	12wk(51mm)	7.5cm	30.5cm	29cm	6.2cm	3.51cm	30.1
274	5013807	21yrs	2	0	1	0	10/05/2018	14/02/2019	32wk+4days	22/02/2019	13wk+4day(70mm)	7.6cm	27cm	26.4cm	6.2cm	3.80cm	32
275	4987609	22yrs	2	1	0	1	15/05/2018	19/02/2019	32wk+2days	19/02/2019	9wk+2day(23mm)	7.8cm	27.9cm	25.3cm	6cm	3.38cm	31
276	2936421	24yrs	1	0	0	0	07/06/2018	14/03/2019	30wk	14/03/2018	11wk+5day(49mm)	7.1cm	27.2cm	22.9cm	5.2cm	2.95cm	28.2
277	4939900	26yrs	1	0	0	0	20/04/2018	25/01/2019	35wk+2day	02/02/2019	8wk+2day(16mm)	8.7cm	29.4cm	28.7cm	6.5cm	3.60cm	35
278	5037979	22yrs	1	0	0	0	01/05/2018	05/02/2019	34WK+6DAYS	05/02/2019	13wk+3day(68mm)	8.4cm	28.9cm	29.4cm	6.3cm	3.64cm	35
279	4077398	22yrs	1	0	0	0	18/03/2018	23/12/2018	32wk+3days	23/12/2018	6wk+4day(8mm)	8.3cm	29.3cm	27.2cm	6cm	3.25cm	32.2
280	4954956	21yrs	2	1	0	1	14/03/2018	19/12/2018	34wk	19/12/2018	8wk+1day(2mm)	8.8cm	29.5cm	29cm	6.4cm	3.77cm	34
281	3018245	21yrs	2	0	1	0	10/03/2018	12/12/2018	33wk+4day	15/12/2018	8wk(2mm)	8.2cm	30.2cm	27.5cm	6.1cm	3.36cm	32.6
282	4860896	24yrs	1	0	0	0	23/02/2018	30/11/2018	35wk+3days	30/11/2018	12wk(52mm)	8.7cm	31.8cm	30.1cm	7.1cm	3.83cm	36.6
283	4861028	22yrs	1	0	0	0	19/03/2018	24-Dec	36wk	24/12/2018	12wk(51mm)	8.6cm	29.2cm	29.6cm	7cm	3.78cm	36.6
284	4879368	24yrs	2	1	0	1	27/02/2018	04/12/2018	34wk+4wk	04/12/2018	7wk+6day(11mm)	8.8cm	30.4cm	30.4cm	6.4cm	3.67cm	35.1
285	4856887	22yrs	2	0	1	0	18/02/2018	25/11/2018	35wk+6day	25/11/2018	9wk+5day(28mm)	8.6cm	30.4cm	29.7cm	6.6cm	3.77cm	34.6
286	4986834	20yrs	1	0	0	0	20/03/2018	25/12/2018	31wk+4day	25/12/2018	13wk+2day(59mm)	8.1cm	28.1cm	26.3cm	5.7cm	3.66cm	31.1
287	4984611	22yrs	1	0	0	0	18/02/2018	25/11/2018	35wk+5days	25/11/2018	9wk(18mm)	8.4cm	31.9cm	29.7cm	6.8cm	3.75cm	36.2
288	4936905	24yrs	2	1	0	1	13/03/2018	18/12/2018	32wk+3days	18/12/2018	9wk(17mm)	8cm	29.7cm	25.8cm	5.6cm	3.63cm	31.6
289	4862424	22yrs	2	1	0	1	26/03/2018	31/12/2018	30wk+4day	31/12/2018	9wk+3day(24mm)	7.9cm	29cm	24.7cm	5.5cm	3.74cm	31.1
290	4827901	22yrs	2	1	0	1	02/04/2018	07/01/2019	33wk+1day	13/01/2019	9wk+3day(24mm)	8.3cm	30cm	29.6cm	5.7cm	3.49cm	33.1
291	4882156	25yrs	4	2	0	2	20/03/2018	25/12/2018	35wk+4day	25/12/2018	11wk+3da(51mm)	9.1cm	32.8cm	34.7cm	6.5cm	3.74cm	37
292	3970129	21yrs	1	0	0	0	24/03/2018	29/12/2018	36wk	29/12/2018	9wk+5day(28mm)	8.2cm	30cm	30.2cm	6.4cm	3.62cm	34.1
293	3700978	23yrs	1	0	0	0	22/03/2018	27/12/2018	35wk+2day	27/12/2018	11wk+3day(57mm)	8.1cm	31cm	30.3cm	6.4cm	4.61cm	35.6
294	4849273	24yrs	2	1	0	1	28/03/2018	02/01/2019	34wk+3day	02/01/2019	8wk+2day(16mm)	8.2cm	30.6cm	28.8cm	6.2cm	3.44cm	34.5
295	5094602	21yrs	1	0	0	0	15/04/2018	20/01/2019	31wk+6day	20/01/2019	12wk+2day(55mm)	8.1cm	30.3cm	26.9cm	6cm	3.53cm	33
296	2887915	22yrs	1	0	0	0	26/03/2018	31/12/2018	34+4wk	31/12/2018	9wk(18mm)	8.8cm	32cm	28.6cm	6.9cm	3.58cm	37
297	4820657	24yrs	2	1	0	1	15/03/2018	20/12/2018	36wk	20/12/2018	13wk+3day(68mm)	8.9cm	31.5cm	31.8cm	6.7cm	3.83cm	36.3
298	3838178	23yrs	1	0	0	0	26/06/2017	02/04/2018	27wk+5day	02/04/2018	12wk+5day(59mm)	6.8cm	27.9cm	24.1cm	5.3cm	2.76cm	28
299	4896999	22yrs	1	0	0	0	25/03/2018	30/12/2018	34wk+4days	30/12/2018	10wk+2day(35mm)	8.8cm	31.5cm	30cm	6.6cm	3.43cm	34.2
300	4930753	22yrs	2	1	0	1	09/04/1948	14/01/2019	32wk+3days	14/01/2019	13wk+4day(78mm)	8.1cm	29.3cm	27.9cm	6.1cm	3.56cm	33
301	4869655	24yrs	1	0	0	0	23/03/2018	28/12/2018	34wk+5day	28/12/2018	9wk+3day(24mm)	8.4cm	30.5cm	28.7cm	6.7cm	3.51cm	35
302	4946871	20yrs	2	1	0	1	03/04/2018	08/01/2019	33wk+4day	08/01/2019	9wk+3day(24mm)	8.1cm	31.7cm	29.7cm	6.6cm	3.49cm	35.6
303	4814172	28yrs	2	1	0	1	30/03/2018	30/03/2018	33wk+5day	04/01/2019	13wk+5day(77mm)	8.4cm	29.6cm	27.8cm	6.4cm	3.48cm	33
304	4813176	24yrs	1	0	0	0	27/03/2018	01/01/2019	33wk+4day	01/01/2019	12wk+1day(56mm)	8.5cm	30cm	28.6cm	6.7cm	3.37cm	34

305	3504111	27yrs	2	1	0	1	01/02/2018	08/11/2018	36wk	13/12/2018	11wk+3day(57mm)	9.1cm	31.2cm	31.9cm	7.1cm	3.54cm	36
306	4906051	24yrs	1	0	0	0	14/03/2018	19/12/2018	35wk+3days	19/12/2018	8wk+2day(16mm)	8.4cm	30.2cm	29cm	6.5cm	3.60cm	34.2
307	4982277	21yrs	1	0	0	0	15/03/2018	26/12/2018	35wk+2day	20/12/2018	9wk+4day(25mm)	8.4cm	29.9cm	28.4cm	6.7cm	3.74cm	35.1
308	4942422	21yrs	1	0	0	0	15/04/2018	20/01/2019	32WK+6DAYS	03/02/2019	11wk+3day44mm)	8.3cm	28.3cm	25.8cm	6.1cm	3.39cm	32.2
309	2763669	24yrs	2	1	0	1	05/02/2018	12/11/2018	36wk	14/12/2018	7wk+3day(9mm)	8.8cm	29.2cm	29.1cm	6.9cm	3.74cm	36
310	3699710	28yrs	2	0	0	0	09/04/2018	14/01/2019	35wk+5days	14/01/2019	9wk(19mm)	8.1cm	26.4cm	25.5cm	5.5cm	3.83cm	36.6
311	4858329	24yrs	1	0	0	0	09/03/2018	14/12/2018	35wk+4day	14/12/2018	7wk+6day(11mm)	9cm	31.3cm	29cm	6.5cm	3.69cm	36
312	4969474	24yrs	1	0	0	0	09/03/2018	14/12/2018	35wk+4day	14/12/2018	11wk+3day44mm)	8cm	29.9cm	28.1cm	6.5cm	3.60cm	34.6
313	4799922	22yrs	2	1	0	1	17/03/2018	22/12/2018	34wk+2day	22/02/2018	8wk+6day(21mm)	8.6cm	30.5cm	28.5cm	6.8cm	3.50cm	34.2
314	4959841	24yrs	1	0	0	0	21/04/2018	26/01/2019	26wk+3days	15/02/2019	9wk+6day(29mm)	6.8cm	25.9cm	21.7cm	4.9cm	3.04cm	26.3
315	4980943	21yrs	2	1	0	1	18/03/2018	23/12/2018	34wk+1day	23/12/2018	11wk+3day(56mm)	8cm	30cm	29.4cm	6.4cm	3.47cm	35
316	3659553	24yrs	1	0	0	0	03/04/2018	08/01/2019	31wk+6day	08/01/2019	7wk+6day(11mm)	8cm	29.8cm	27cm	6cm	3.45cm	32.6
317	4878974	27yrs	1	0	0	0	28/02/2018	05/12/2018	36wk	05/12/2018	10wk+5day(43mm)	8.3m	30.4cm	30.9cm	5.7cm	3.80cm	35.1
318	4319191	25yrs	2	1	0	1	27/03/2018	01/01/2019	35wk+4day	01/01/2019	11wk+1day(44mm)	8.4cm	30.9cm	28.4cm	7.1cm	3.44cm	36.5
319	4712344	25yrs	1	0	0	0	15/12/2017	21/09/2018	32wk+4days	21/09/2018	9wk+4day(23mm)	9cm	31.6cm	31cm	6.7cm	3.23cm	36.4
320	4860935	22yrs	1	0	0	0	11/03/2018	16/12/2018	34wk+1day	16/12/2018	11wk+3day(39mm)	8.1cm	29.7cm	27.4cm	6.6cm	3.44cm	34
321	4959825	23yrs	1	0	0	0	02/03/2018	07/12/2018	35wk+3days	07/12/2018	13wk+4day(65mm)	8.6cm	29.4cm	29.2cm	6.6cm	3.74cm	34.2
322	4934561	24yrs	1	0	0	0	15/11/2017	22/08/2018	32wk+6day	22/08/2018	12wk+5day(52mm)	7.4cm	27cm	26.1cm	5.1cm	3.43cm	39.1
323	5058788	20yr	1	0	0	0	08/06/2018	15/03/2019	28wk+5day	22/02/2019	12wk+1day(58mm)	6.4cm	23cm	23.8cm	4.7cm	2.86cm	25.4
324	5026778	28yrs	1	0	0	0	05/04/2018	10/01/2019	35wk+1day	20/01/2019	9wk+4day(27mm)	9cm	27.8cm	27.3cm	6.8cm	3.97cm	35.1
325	4852454	22yrs	2	1	0	1	10/04/2018	15/01/2019	35wk+3days	23/01/2019	8wk+5day(19mm)	8.7cm	30.9cm	29cm	6.7cm	3.59cm	34.4
326	4961097	22yrs	1	0	0	0	09/05/2018	13/02/2018	31wk+2day	13/02/2018	10wk+5day(22mm)	7.6cm	30cm	26.5cm	6.2cm	3.73cm	32.2
327	4930767	22yrs	2	1	0	1	11/04/2018	16/01/2019	35wk+1day	16/01/2019	11wk(36mm)	8.6cm	31.3cm	30.2cm	6.7cm	3.64cm	35.4
328	5053667	34yrs	2	1	0	0	23/03/2018	28/12/2018	35wk+5days	12/01/2019	7wk+6day(12mm)	8.8cm	31.8cm	29.7cm	6.6cm	3.60cm	36.4
329	4963084	21yrs	2	1	0	1	18/04/1948	23/01/2019	34wk+1day	23/01/2019	8wk+6day(21mm)	8cm	29.2cm	27.9cm	6.2cm	3.86cm	32.3
330	4970944	24yrs	2	1	0	1	11/05/2018	15/02/2018	30wk+5day	15/02/2018	11wk+3day(47mm)	8cm	28.2cm	29cm	5cm	3.21cm	33.2
331	4888423	22yrs	1	0	0	0	10/04/2018	15/01/2019	34wk+2day	15/01/2019	10wk+6day(43mm)	8.3cm	29.8cm	29.7cm	6.4cm	3.51cm	34
332	4841152	22yrs	2	1	0	0	04/04/2018	09/01/2019	35wk+1day	09/01/2019	8wk+5day(19mm)	8.9cm	32.2cm	31.7cm	6.6cm	3.65cm	37
333	4698732	25yrs	2	1	0	1	15/04/2018	20/01/2019	31wk+4day	20/01/2019	7wk+4day(14mm)	7.3cm	29cm	25.8cm	6.4cm	3.36cm	36
334	4997958	21urs	2	1	0	1	10/04/2018	15/01/2019	34wk+3day	15/01/2019	11wk(36mm)	8.4cm	31.1cm	29.9cm	5.6cm	3.83cm	31
335	4918188	21yrs	2	1	0	1	28/04/1948	02/02/2019	32wk+2day	02/02/2019	12wk+3day(68mm)	8.3cm	28.2cm	27.3cm	6.1cm	3.55cm	32
336	4889655	22yrs	2	1	0	0	15/04/2018	20/01/2019	34wk+1day	20/01/2019	13wk+6day(73mm)	8.9cm	30.7cm	30cm	6.5cm	3.71cm	35.2
337	4710561	22yrs	1	0	0	0	03/12/2007	09/09/2018	26wk+1day	09/09/2018	11wk+2day(45.3mm)	7cm	24.5cm	20.4cm	4.8cm	2.77cm	26.4
338	4581256	22yrs	1	0	0	0	25/04/2018	30/01/2019	33wk	30/01/2019	12wk+3day(54mm)	8.1cm	29.6cm	27.2cm	6.6cm	3.57cm	33.6
339	4837984	25yrs	1	0	0	0	04/04/2018	09/01/2018	35wk+1day	09/01/2018	11wk(36mm)	8.1cm	30.7cm	29.6CM	6.6cm	3.63cm	35
340	4840473	26yrs	1	0	0	0	07/04/2018	12/01/2019	34wk+5day	12/01/2019	9w(26mm)	9.1cm	33cm	30.3cm	6.7cm	3.63cm	37.6
341	4694516	21yrs	2	1	0	1	unknown	22/08/2018	29wk+5days	22/08/2018	8wk(24mm)	7.02cm	27.2cm	28cm	5cm	3.10cm	30
342	4568321	20yrs	2	1	0	1	18/12/2018	14/09/2018	26wk+4day	14/09/2018	10wk(42mm)	6.9cm	24cm	23.8cm	4.9cm	2.82cm	26
343	1337701	21yys	2	1	0	1	unknown	16/07/2018	32wk	16/07/2018	9wk(22mm)	8.32cm	30cm	27.4cm	6.78cm	3.27cm	34
344	4879311	22yrs	2	1	0	1	09/11/2017	26/08/2018	29wk+5days	26/08/2018	78mm(13wk+4day)	7.01cm	27cm	27.6cm	5.03cm	3.25cm	29.2
345	4977021	21yrs	1	0	0	0	29/04/2018	03/02/2019	32wk+1day	03/02/2019	11wk+6(49mm)	8cm	28.6cm	25.5cm	6.4cm	3.44cm	33.4
346	4771971	25yrs	1	0	0	0	10/02/2018	17/11/2018	35wk+2days	17/11/2018	10wk(25mm)	8.6cm	28.6cm	27.8cm	6.5cm	3.56cm	33.3
347	4781742	22yrs	2	1	0	1	24/02/2018	01/12/2018	35wk+3day	01/12/2018	13wk(67mm)	8.8cm	31.2cm	30.6cm	6.8cm	3.88cm	36.1
348	4805144	21yrs	1	0	0	0	12/10/2017	19/07/2018	35wk+5day	19/07/2018	13wk+2day(68mm)	8.9cm	32.5cm	28.8cm	6.3cm	5.02cm	34.6

349	4778725	21yrs	1	0	0	0	05/10/2017	12/07/2018	36wk	20/06/2018	58mm(12wk+2day)	9.4cm	33.1cm	34.5cm	5.03cm	5.03cm	39.1
350	4832476	21yrs	1	0	0	0	09/10/2017	16/07/2018	35wk+3day	16/07/2018	13wk+3day(69mm)	8.3cm	30.3cm	31.4cm	6.5cm	3.77cm	36.4
351	5347784	20yrs	1	0	0	0	15/10/2017	22/07/2018	34wk+4day	22/07/2018	11wk+5day(49mm)	8.5cm	28.6cm	28.4cm	6.4cm	3.60cm	33.2
352	4620742	21ys	1	0	0	0	30/10/2017	06/08/2018	33wk+4day	28/07/2018	8wk+4day(18mm)	8cm	30cm	628.2cm	6.3cm	3.76cm	33.4
353	3991393	24yrs	1	0	0	0	02/10/2017	09/07/2018	31wk+4day	09/07/2018	13wk(72mm)	7.7cm	26.4cm	25.3cn	5.7cm	3.59cm	31.4
354	4708188	20yrs	2	1	0	1	19/12/2001	25/09/2018	28wk+6day	25/09/2018	8wk+3day(17mm)	7.2cm	27.5cm	23.3cm	5.3cm	3.15cm	28.6
355	4819351	21yrs	1	0	0	0	28/09/2017	05/07/2018	35wk+4day	05/07/2018	9wk+2day(24mm)	8.9cm	29.7cm	29.2cm	6.8cm	3.49cm	35.2
356	4789586	22yrs	1	0	0	0	07/10/2017	14/07/2018	34wk	14/07/2018	7wk+2day(13mm)	8.9cm	30.1cm	28.3cm	6.5cm	4.07cm	34.4
357	4728588	23yrs	1	0	0	0	17/11/2017	24/08/2018	30wk3day	24/08/2018	11wk(48mm)	7.3cm	28.1cm	25.4cm 6.1cm	6.1CM	3.56cm	30.4
358	4862874	21yrs	1	0	0	0	26/09/2017	03/07/2018	36wk	03/07/2018	6wk+2day(2mm)	8.9cm	30.5cm	30.3cm	7.1cm	5.29cm	37.4
359	4820651	21yrs	1	0	0	0	05/10/2017	12/07/2018	34wk+5day	12/07/2018	9wk+2day(32mm)	8.6cm	28.4cm	30.2cm	68cm	4.88cm	34.4
360	4904522	24yrs	1	0	0	0	28/02/2018	05/12/2018	35wk+3day	05/12/2018	10wk(40mm)	8.8cm	30.5cm	31cm	6.8cm	3.53cm	35.6
361	2400849	23yrs	1	0	0	0	20/11/2017	27/08/2018	29wk3day	27/08/2018	10wk(29mm)	6.9cm	24.6cm	21.9cm	4.9cm	3.17cm	26.5
362	4632357	19yrs	1	0	0	0	28/10/2018	04/08/1948	26wk	04/08/2018	12wk+2day(52mm)	6.2cm	22.7cm	19.9cm	4.7cm	2.97cm	26
363	4788727	21yrs	1	0	0	0	04/12/2017	10/09/2018	26wk+1day	10/09/2018	8wk+4day(15mm)	6.1cm	22.8c	20.1cm	4.6cm	2.80cm	24.5
364	4670521	26yrs	2	1	0	1	23/05/2017	27/02/2018	27wk	27/02/2018	9wk(22mm)	7.2cm	26.9cm	22.7cm	5.2cm	3.32cm	27
365	3852289	27yrs	2	1	0	1	14/11/2018	21/08/2018	26wk+2day	21/08/2018	13wk+5day(73mm)	6.45cm	25.3cm	19.3cm	4.64cm	3.07cm	27
366	4855316	22yrs	2	1	0	1	24/04/2018	29/01/2019	35wk+4day	29/01/2019	13wk+2day(75mm)	8.9cm	30.6cm	29.6cm	7cm	3.90cm	36
367	3709168	28yrs	3	2	0	2	25/04/2018	02/02/2019	35wk+2days	02/02/2019	13wk+6day(65mm)	8.7cm	30cm	28.9cm	6.5cm	3.89cm	34.6
368	4518870	23yrs	1	0	0	0	21/07/2017	27/04/1948	32wk+6day	27/04/1948	9wk+6day(28mm)	8.4cm	30.3cm	28cm	5.9cm	3.40cm	33
369	4321432	24yrs	1	0	0	0	03/12/2017	09/09/2018	30wk+2day	09/09/2018	13wk+5day(72mm)	7.3cm	27.9cm	22.6cm	5.9cm	3.12cm	32
370	4842546	28yrs	1	0	0	0	02/04/2018	07/01/2019	35wk+4day	07/01/2019	12wk+4day(60mm)	8.6cm	31.2cm	29.9cm	6.6cm	3.67cm	35.4
371	4900911	28yrs	3	1	1	1	03/01/2018	10/10/2018	32wk+5day	10/10/2018	11wk(34mm)	8.6cm	29.2cm	27.6cm	6.2cm	3.37cm	33.1
372	3574653	21yrs	1	0	0	0	26/09/2017	03/07/2018	35wk+6day	03/07/2018	9wk+1day(24mm)	9.4cm	30.7cm .29.6cm	29.9cm	6.8cm	4.03cm	34.6
373	4234567	24yrs	1	0	0	0	15/11/2017	22/08/2018	28wk+2day	22/08/2018	13wk(70mm)	6.5cm	25.9cm	21.5cm	4.8cm	3.27cm	26.4
374	4711526	26yrs	2	1	0	1	23/10/2017	30/07/2018	34wk+2day	30/07/2018	10wk+1wk(41mm)	7.8cm	29.9cm	26.6cm	6.2cm	3.68cm	34.2
375	4787904	24yrs	2	1	0	1	26/12/2017	02/10/2018	26wk+4day	02/10/2018	10wk(42mm)	6.5cm	22.9cm	20.3cm	4.8cm	2.80cm	25.3
376	884586	24yrs	3	1	1	1	15/06/2017	22/03/2018	28wk	22/03/2018	43mm(11wk)	7.5cm	27.6cm	26.2cm	5.2cm	3.65cm	28
377	4595757	24yrs	1	0	0	0	02/10/2017	09/07/2018	35wk+5day	09/07/2018	6wk+5day(5mm)	8.7cm	31.3cm	30.8cm	6.5cm	4.59cm	35.4
378	4775985	28yrs	1	0	0	0	17/11/2017	24/08/2018	29wk	24/08/2018	13wk(74mm)	7.1cm	25.9cm	22.6cm	4.8cm	3.14cm	27.2
379	4667023	21yrs	1	0	0	0	01/12/2017	08/07/2018	35wk+5day	08/07/2018	9wk(24mm)	8.2cm	32cm	30.2cm	6.8cm	4.29cm	36
380	4602078	21yrs	1	0	0	0	11/10/2018	18/07/2018	33wk+6days	18/07/2018	10wk+1day(36mm)	8.3cm	28.8cm	28.9cm	6.2cm	4.35cm	34.1
381		24yrs	4	2	0	2	10/10/2017	17/07/2018	33wk+3day	17/07/2018	12wk+4day(61mm0	8.3cm	32cm	29.6cm	6.3cm	4.69cm	34.2
382	4784767	25yrs	2	0	1	0	23/03/2018	27/12/2018	28wk+5day	27/12/2018	9wk+3day(26mm)	7.62cm	26.5cm	22.5cm	5.04cm	3.04cm	28.6
383	4976984	25yrs	1	0	0	0	04/05/2018	08/02/2019	26wk+2day	08/02/2018	11wk(34mm)	6.53cm	24.8cm	21.8cm	4.86cm	2.80cm	26.2
384	4710601	21yrs	1	0	0	##	16/09/2017	23/06/2018	27wk+2day	23/06/2018	9wk+5day(63mm)	6.3cm	22.6cm	23.6cm	4.8cm	2.7cm	26
385	4849189	22yrs	2	1	0	1	05/12/2017	11/09/2018	35wk+2day	11/09/2018	11wk+3day(27mm)	8.5cm	30.5cm	29.7cm	6.9cm	3.75cm	34.2
386	4858609	28yrs	2	0	1	0	12/12/2017	18/09/2018	34wk+3day	18/09/2018	9wk+3day(20mm)	8.8cm	31.6cm	30.3cm	7cm	3.66cm	36.6
387	4812714	24yrs	2	0	1	0	04/10/2017	11/07/2018	33wk+3day	11/07/2018	13wk+2day(66mm)	8.2cm	28.8cm	27.2cm	6.1cm	3.51cm	32.3
388	4782263	24yrs	2	1	0	1	05/12/2017	11/09/2018	34wk+1day	11/09/2018	11wk(40mm)	8.1cm	28.7cm	26.8cm	6.3cm	3.45cm	32.2
389	4781387	28yrs	4	2	1	2	20/02/2018	27/11/2018	31wk+1day	27/11/2018	10wk(42mm)	8.3cm	30.2cm	26.2cm	6.2cm	3.89cm	31.6
390	4781121	28yrs	2	1	0	1	08/02/2018	15/11/2018	32k+5day	15/11/2018	13wk(72mm)	8.1cm	29.5cm	28.8cm	6.3cm	3.28cm	33.1
391	4879342	22yrs	1	0	0	0	15/12/2017	21/09/2018	34wk+5days	07/09/2018	8wk(20mm)	8.4cm	30.9cm	30.1cm	6.5cm	3.52cm	34.5
392	5467890	21yrs	2	1	0	##	29/10/2017	05/08/2018	30wk+5day	05/08/2018	13wk+2day(72mm)	8cm	30.9cm	28cm	6.2cm	3.14cm	34

393	5298443	21yrs	1	0	0	0	23/10/2017	30/07/2018	31wk+2day	30/07/2018	8wk+5day(21mm) 7.5mc	7.5cm	27.8cm	25.6cm	5.8cm	3.21cm	30.1
394	4776022	19yrs	1	0	0	0	11/11/2017	18/08/2018	35wk+5day	18/08/2018	13wk(70mm0)	8.4cm	31.5cm	30.6cm	6.4cm	3.62cm	35
395	4622453	21yrs	1	0	0	0	25/09/2017	02/07/2018	34wk+5day	02/07/2018	13wk+5day(74mm)	8.5cm	30.7cm .29.6cm	27.7cm	6.4cm	3.42cm	34.3
396	3506544	22yrs	1	0	0	0	12/09/2017	19/06/2018	35wk+3day	19/06/2018	8wk+1day(18mm)	8.9cm	32.7cm	29cm	6.9cm	3.55cm	36.1
397	4775797	26ys	1	0	0	0	09/12/2017	15/09/2018	33wk	15/09/2018	9wk+2day(33mm)	8.3cm	30cm	28.4cm	6.1cm	3.38cm	33.1
398	4797111	26yrs	##	##	0	0	17/09/2018	24/06/2018	35wk+3day	24/06/2018	11wk+4day(72mm)	8.5cm	29.9cm	29.2cm	6.6cm	3.59cm	34.2
399	4476843	22yrs	1	1	1	1	25/05/2017	03/03/2018	27wk+6days	03/03/2018	11wk+day(48mm)	7.3cm	24.5cm	21.4cm	5cm	2.92cm	28
400	4770108	21yrs	2	1	0	1	05/12/2017	11/09/2018	29wk+1day	11/09/2018	12wk+6day(60mm)	7.7cm	29.2cm	27.3cm	5.7cm	4.12cm	31.2
401	2986138	21yrs	1	0	0	0	20/02/2018	27/11/2018	32wk+1day	27/11/2018	13wk+3dy(67mm)	8.1cm	28.9cm	26.9cm	6.2cm	3.52cm	32.1
402	4783012	21yrs	1	0	0	0	01/02/2018	08/11/2018	27wk	08/11/2018	9wk(28mm)	6.9cm	26.2cm	22.2mc	5.4mc	3.61cm	27.6
403	4754180	22yrs	1	0	0	0	09/10/2017	16/07/2018	33wk	16/07/2018	11wk4day(49mm)	8.5cm	28.4cm	28.4cm	6.3cm	3.41cm	33
404	4747033	24yrs	1	0	0	0	14/08/2017	21/05/2018	35wk+2day	21/05/2018	11wk(41mm)	8.4cm	31.4cm	31.4cm	6.8cm	3.53mc	36
405	4476965	21yrs	1	0	0	0	10/06/2017	17/03/2018	33wk+3days	17/03/2018	10wk+3day(36mm)	8.2cm	29.6cm	29.4cm	6.2cm	3.81cm	33.2
406	4756428	21yrs	1	0	0	0	20/11/2018	27/08/2018	32wk+1day	27/08/2018	9wk+1day(16mm0	8.2cm	29cm	27.2cm	5.6cm	3.28cm	31.1
407	4792803	26yrs	2	1	0	1	19/02/2018	26/11/2018	31wk+4day	26/11/2018	13wl+1day(64mm)	8.2cm	28.5cm	27.9cm	5.9cm	3.28cm	32
408	4734115	28yrs	3	2	0	2	27/11/2017	03/09/2018	34wk+4day	03/09/2018	13wk(72mm)	8.5cm	31.8mc	29.8cm	6.7cm	3.65cm	35.3
409	4660977	24yrs	1	0	0	0	27/08/2017	03/06/2018	35wk+5day	20/06/2018	10wk+2day(64mm)	8.4cm	29.5cm	28.1cm	6.3cm	3.38cm	36.1
410	4687539	24yrs	1	0	0	0	not known	11/09/2018	33wk+3day	11/09/2018	13wk(70mm)	8.4cm	31.2cm	27.7cm	6.4cm 3.46c	3.46cm	33.3
411	4746950	21yrs	1	0	0	0	24/11/2017	31/08/2018	28wk+4day	07/09/2018	11wk(16mm)	7.3cm	27.5cm	27.5cm	5.2cm	2.92cm	28.4
412	4719995	21yrs	1	0	0	0	17/11/2017	24/08/2018	35wk+3day	24/08/2018	8wk(19mm)	8.9cm	32.4cm	29.9cm	3.78cm	3.78cm	36.4
413	4558853	21yrs	1	0	0	0	06/09/2017	13/06/2018	35wk+2day	13/06/2018	7wk+2day(7mm)	8.6cm	31.3cm	30.6cm	6.6cm	3.63cm	35.4
414	4713418	21yrs	1	0	0	0	05/11/2017	12/08/2018	26wk+4day	12/08/2018	7wk+1day(11mm)	6.8cm	23.6cm	22cm	5cm	3.12cm	26.4
415	4730934	21yrs	1	0	0	0	18/10/2017	25/07/2018	35wk	25/07/2018	11wk(42mm)	8.8cm	31cm	30.1cm	6.5cm	3.51cm	35.5
416	4666586	28yrs	1	0	0	0	17/11/2017	24/08/2018	33wk+4day	24/08/2018	13wk+4day(76mm)	8.6cm	30.2cm	28.4cm	6.5cm	3.43cm	34.2
417	4652967	24yrs	2	1	0	1	11/11/2017	18/08/2018	34wk+3day	18/08/2018	13wk(76mm)	8.1cm	29.3cm	24.6cm	6.2cm	3.44cm	31.4
418	4750432	21yrs	1	0	0	0	13/06/2017	20/03/2018	27wk+2days	04/09/2018	11wk(44mm)	6.7cm	24.7cm	21.7cm	5.13c,	3.16cm	27
419	4317161	28yrs	1	0	0	0	15/12/2017	21/09/2018	36wk	21/09/2018	11wk(29mm)	8.8cm	31.4cm	29.2CM	6.7cm	4.06cm	36
420	4805495	24yrs	1	0	0	0	06/02/2018	13/11/2018	33wk	13/11/2018	7wk+4day(10mm)	8.2cm	30.2cm	29.5cm	6.5cm	3.34cm	34
421	4703377	22yrs	1	0	0	0	11/09/2017	18/06/2018	33wk+4day	18/06/2018	12wk+4day(55mm)	7.9cm	28.4cm	26.2cm	6.3cm	3.40cm	31.5
422	4714098	22yrs	2	1	0	1	26/08/2017	02/06/2018	35wk+4day	02/06/2018	10wk(30mm)	8.9cm	29.9cm	29.9cm	7.1cm	3.45cm	36
423	3518612	21yrs	2	1	0	1	29/09/2017	06/07/2018	26wk	06/07/2018	9wk(23mm)	6.6cm	23.2cm	20.1cm	5cm	2.62cm	25.3
424	4716270	24yrs	1	0	0	0	29/11/2017	05/09/2018	30wk+1day	05/09/2018	9wk+2day(27mm)	7.4cm	27.7cm	26.1cm	5.8cm	3.57cm	31.4
425	4743877	21yrs	1	0	0	0	07/09/2017	14/06/2018	33k+2day	14/06/2018	12wk(57mm)	8.2cm	29.8cm	30.5cm	6.4cm	3.37cm	33.6
426	3761796	26yrs	2	1	0	1	18/09/2017	26/06/2018	34wk+4day	17/06/2018	12wk+4day(58mm)	82cm	29.5cm	28.4cm	6.1cm	3.53cm	34.4
427	4677662	28yrs	1	0	0	0	12/10/2017	19/07/2018	34wk+4day	19/07/2018	5cm(11wk)	8.5cm	28.6cm	28.3cm	6.1cm	3.61cm	36
428	4742662	26yr	1	0	0	0	11/11/2017	18/08/2018	27wk+2day	18/08/2018	8wk+6day(18mm)	6.6cm	23.3xm	20.3cm	4.7cm	2.76cm	27
429	4735688	24yrs	1	0	0	0	15/08/2017	22/05/2018	36wk	31/05/2018	9wk(23mm)	8.4cm	29.2cm	29.6cm	6.4cm	3.75cm	36
430	4694282	19yrs	2	1	0	1	13/12/2017	19/09/2018	27wk+5days	19/09/2018	7wk+5day(10mm)	7.1cm	24cm	24.1cm	4.9cm	3.20cm	28
431	4461881	28yrs	2	1	0	1	02/06/2017	09/03/2018	31wk+3days	09/03/2018	10wk(40mm)	8.3cm	31cm	26.3cm	6.07cm	4cm	332.6
432	886228	29yrs	3	1	1	1	12/11/2017	19/08/2018	34wk+1day	19/08/2018	11wk(30mm)	8.4cm	29cm	28cm	6.4cm	4.2cm	35.2
433	2907931	18yrs	4	2	1	2	21/11/2017	28/08/2018	27wk+6days	28/08/2018	13wk(74mm)	7.1cm	26.7cm	23cm	5.31cm	2.96cm	28.5
434	4774401	21yr	1	0	0	0	15/09/2017	22/06/2018	35wk+1day	22/06/2018	10wk(32mm)	8.2cm	29.7cm	29.2cm	6.6cm	3.57cm	33.5
435	4757468	20yr	1	0	0	0	18/09/2017	25/06/2018	34wk+5day	25/06/2018	8wk+5day(21mm)	8.3cm	30cm	28.8cm	6.3cm	3.50cm	33.3
436	4064144	21yr	1	0	0	0	23/07/2017	29/04/2018	28wk+4day	29/04/2018	10wk(40mm)	6.9cm	24.9cm	20.6cm	4.7cm	3.08cm	25.3

437	4600954	21yr	1	0	0	0	31/10/2017	07/08/2018	33wk+6day	07/08/2018	13wk+3day(68mm)	8.1cm	27.2cm	25.9cm	6.2cm	3.40cm	31.3
438	4694704	22yr	1	0	0	0	22/10/2017	29/07/2018	28wk+1day	29/07/2018	11wk+5day(46mm)	7.7cm	27.3cm	23cm	5.4cm	2.82cm	29
439	4754453	21yr	1	0	0	##	15/08/2017	22/05/2018	32wk+5day	27/06/2018	11wk(41mm)	7.5cm	29.8cm	28.2cm	6cm	3.61cm	32.5
440	3468440	24yrs	2	0	1	0	27/09/2017	04/07/2018	31wk+1day	11/07/2018	12wk+3day(60mm)	7.5cm	27.8cm	27.3cm	6.1cm	3.22cm	31.1
441	4639282	28yrs	3	2	0	2	25/09/2017	02/07/2018	32wk+3day	02/07/2018	13wk(68mm)	8.3cm	28.7cm	28.3cm	6.1cm	3.32cm	32.4
442	4231567	22yrs	1	0	0	0	15/06/2017	22/03/2018	28 wk	02/04/2018	43mm (11wks)	7.5cm	27.6cm	26.2cm	5.2cm	3.65cm	28.3
443	3181916	20yr	2	1	0	1	16/07/2017	22/04/2018	31wk+1day	22/04/2018	10wk+day(32mm)	7.9cm	28.7cm	26.5cm	5.82cm	3.9cm	32.6
444	4660977	28yrs	1	0	0	0	27/08/2017	03/06/2018	35wk+6days	19/06/2018	3.49cm(10wk+3)	8.4cm	29.5cm	28.1cm	6.3cm	3.38cm	35.5
445	4584269	24yrs	2	1	0	1	03/06/2017	10/03/2018	26wk+6days	10/03/2018	4.7cm(11wk+2)	6.7cm	24.7cm	21.9cm	4.6cm	3.27cm	27
446	4755212	21yrs	1	0	0	0	04/10/2017	11/07/2018	32wk+3days	11/07/2017	2.6cm(9wks)	8.33cm	29.1cm	26.3cm	6.4cm	3.48cm	32.3
447	4550030	28yrs	4	2	1	2	02/09/2017	12/05/2018	26wk+6days	12/05/2018	7.5cm(13wk+6)	6.34cm	23.9cm	20.6cm	4.99cm	2.94cm	27
448	4656971	26yrs	2	1	0	0	23/07/2017	29/04/2018	27wk+1day	04/05/2018	3.93cm	6.4cm	25cm	22.6cm	4.8cm	3.17cm	27.2
449	4639771	23yrs	2	1	0	1	06/07/2017	12/04/2018	31wk	17/04/2018	7.2cm(13wk+5)	7.4cm	26.2cm	25.8cm	5.7cm	3.7cm	32
450	4576803	21yrs	1	0	0	0	06/06/2017	13/03/2018	27wk	14/03/2018	2.3cm	6.9cm	26.6cm	21.8cm	5.1cm	3.02cm	28.2
451	4565292	21yrs	1	0	0	0	02/07/2017	08/04/2018	28wk+5days	11/04/2018	(8wk+3)26mm	7.16cm	26.4cm	2.33cm	5.36cm	3.17cm	29
452	4660173	20yrs	1	0	0	0	30/07/2017	06/05/2018	27wk+1day	06/05/2018	7.9cm(13wk+6)	7.4cm	27.1cm	22.36cm	5.05cm	2.81cm	28
453	4643754	22yrs	1	0	0	0	09/08/2017	16/05/2018	31wk+5days	17/05/2018	9wk+4days(2.05cm)	8cm	30.1cm	27.7cm	6.2cm	4.05cm	32.5
454	4713859	26yrs	1	0	0	0	30/11/2017	06/09/2018	26wk+2days	06/09/2018	30.3mm(8wk+6)	6.7cm	23.5cm	20cm	4.9cm	2.8cm	26
455	4585187	24yrs	2	0	1	0	03/06/2018	10/03/2017	26wk+4days	26/03/2018	0.9cm(6wk+2)	7.14cm	25.93cm	22.69cm	5.49cm	3.29	27
456	4357167	24yrs	1	0	0	0	23/05/2017	27/02/2018	30wk+2days	27/02/2018	22mm(9wks)	7.2cm	26.9cm	22.7cm	5.2cm	3.32cm	31.4
457	884767	26yrs	2	1	0	1	05/11/2017	12/08/2018	34wk+2days	12/08/2018	43mm(10wk+6)	8.65cm	31.9cm	29.4cm	6.66cm	4.37cm	35.1
458	886663	35yrs	1	0	0	0	30/12/2017	06/10/2017	27wk+4days	02/10/2017	6.4cm(12wk+1)	6.69cm	23.9cm	23.2cm	5cm	3.36cm	28
459	4532176	28yrs	2	1	0	1	01/12/2017	07/09/2018	31wk+6days	07/09/2018	43mm(11wks)	6.78cm	27.5cm	25.2cm	5.39cm	3.87CM	29
460	4721330	28yrs	1	0	0	0	02/12/2017	09/09/2019	27wk+2days	09/09/2018	5cm(11wk+6)	6.89cm	24.3cm	21.1cm	5.36cm	2.86cm	27.6
461	5018132	24yrs	1	0	0	0	01/04/2018	06/01/2019	35wk+5day	06/01/2019	10wk(30mm)	8.5cm	30.9cm	29.4cm	6.6cm	3.64cm	34.3
462	4708188	21yrs	2	0	1	0	19/12/2017	25/09/2017	28wk+6days	28/08/2017	1.7cm(8wk+1)	7.2cm	27.5cm	23.3cm	5.3cm	3.1cm	28.6
463	4797839	27yrs	2	1	0	1	05/11/2017	12/08/2018	29wk+3days	12/08/2018	5.8cm(12wks)	7.76cm	27.5cm	23.2cm	5.63cm	3.74cm	30.3
464	4648669	20yrs	3	2	0	2	25/10/2017	01/08/2018	31wk+5day	01/08/2018	11wk(44mm)	7.4cm	28.4cm	24.4cm	6.2cm	3.8cm	32.2
465	4783457	20yrs	1	0	0	0	09/12/2017	15/09/2018	26wk	15/09/2018	13wk(53mm)	5.9cm	23.7cm	18.8cn	4.8cm	3cm	27
466	4946394	24yrs	1	0	0	0	17/12/2018	24/11/2018	28wk+4days	24/11/2018	7wk+4day(7mm)	6.6cm	24.3cm	20.3cm	5.3cm	3.04cm	26.6
467	5022522	21yr	1	0	0	0	30/03/2018	04/01/2018	35wk+4day	04/01/2019	10wk(30mm0	9cm	32.1cm	30.7cm	6.6cm	3.85cm	37.2
468	4558996	24yrs	1	0	0	0	21/07/2017	15/05/2018	26wk+6days	15/05/2018	0.9cm(7wk+3)	6.95cm	25.4cm	22cm	4.9cm	2.88cm	27
469	4559616	23yrs	2	1	0	1	19/05/2017	23/02/2018	26wk+4days	08/03/2018	8.5cm(6wk+6)	6.6cm	24cm	25cm	4.92cm	2.83cm	26.2
470	4875348	22yrs	1	0	0	0	15/04/2018	20/01/2019	35wk+5day	20/01/2019	11wk(43mm)	8.7cm	29.2cm	29.2cm	6.6cm	3.76cm	34.2
471	867815	24yrs	3	1	1	1	30/03/2017	06/06/2018	31wk	13/06/2018	2.31cm	7.65cm	29.4cm	26.9cm	6.08cm	3.8cm	32
472	4803258	28yrs	1	0	0	0	26/09/2018	03/07/2018	35wk+3days	03/07/2018	2.5cm(9wk+2)	8cm	29.3cm	26.7cm	6.3cm	4.24cm	35
473	4635320	21yrs	4	2	0	2	10/10/2017	17/08/2018	33wk+3days	17/08/2018	6.1cm	8.3cm	32cm	29.6cm	6.3cm	4.6cm	34.6
474	4900266	24yrs	1	0	0	0	30/04/2018	04/12/2018	33wk+3day	04/12/2018	12wk+5da(67mm)	7.9cm	29.3cm	27.5cm	6.2cm	3.71cm	32.2
475	4567890	27yrs	1	0	0	0	04/04/2017	09/01/2018	32wk+1day	09/01/2018	2.4cm(9wk)	9.15cm	30.12cm	27.45cm	6.24cm	4.57cm	32.4
476	4714933	27yrs	1	0	0	0	01/10/2017	08/07/2018	34wk+5days	05/07/2018	6.2cm(12wk)	8.52cm	29.3cm	21.5cm	6.35cm	3.64cm	35.1
477	4820222	26yrs	1	0	0	0	02/10/2017	09/07/2018	34wk+4days	09/07/2018	2.2cm(9wks)	8.7cm	23.1cm	30.5cm	6.43cm	4.62cm	34
478	4806961	28yrs	1	0	0	0	25/09/2017	02/07/2018	35wk+3days	02/07/2018	7.2cm(13wk)	9.07cm	29.6cm	29.1cm	6.62cm	4.5cm	36
479	3527175	26yrs	7	1	5	0	07/09/2017	14/06/2018	36wks	14/06/2018	2.2cm(9wks)	9.20cm	31.5cm	28.4cm	6.5cm	3.68cm	36.2
480	4651566	25yrs	2	1	0	1	08/10/2017	15/07/2017	26wk+1day	15/07/2017	2.5cm(6wk+4)	6.3cm	24.2cm	22.5cm	5cm	2.67cm	28

481	4640014	24yrs	2	1	0	1	15/06/2017	22/03/2018	36wks	22/03/2018	11wk(54mm)	8.56cm	30.4cm	30cm	6.55cm	4.5cm	36.1
482	4871332	21yrs	1	0	0	0	23/04/2018	28/01/2019	34wk+3day	28/01/2019	9wk(26mm)	8.4cm	30.2cm	28.3cm	6.4cm	3.50cm	33.3
483	4942905	24yrs	1	0	0	0	07/04/2018	12/01/2019	31wk+4day	12/01/2019	8wk+3day(17mm)	7.8cm	28.9cm	26.1cm	5.7cm	3.3cm	31.2
484	3195400	22yrs	2	1	0	1	16/09/2017	23/06/2018	26wk+4days	01/07/2018	3.6cm(10wk+4)	6.9cm	25.7cm	22.7cm	5.1cm	3.41cm	26.6
485	4779815	22yrs	1	0	0	0	22/11/2017	29/08/2018	26wk+5days	29/08/2018	4.3cm(11wk)	6.8cm	24.7cm	20.8cm	4.7cm	2.66cm	25.6
486	4754192	24yrs	1	0	0	0	09/11/2017	16/08/2018	26wk+4days	16/08/2018	3.9cm(10wk)	6.4cm	25.1cm	22.4cm	4.8cm	2.78cm	27.4
487	4525762	21yrs	1	0	0	0	30/06/2017	06/04/2018	26wk+4day	06/04/2018	2.0cm(9wks)	6.5cm	23.7cm	21.7cm	4.9cm	2.7cm	25.6
488	4432586	22yrs	2	1	0	1	23/04/2018	28/01/2019	34wk+4days	28/01/2019	65mm(12wk+5)	8.9cm	30.3cm	28.4cm	6.5cm	3.8cm	35.1
489	4600754	20yrs	1	0	0	0	08/06/2017	15/03/2018	30wk+4day	15/03/2018	10wk(20mm)	7.4cm	28.2cm	23.4cm	5.06cm	3.38cm	27.5
490	4987620	24yrs	2	1	0	1	01/05/2018	05/02/2019	33wk+1day	13/02/2019	11wk+6day(51mm)	7.9cm	28.7cm	29.5cm	5.7cm	3.37cm	34.1
491	4749006	28yrs	2	1	0	1	11/12/2017	17/09/2018	26wks+2days	17/09/2018	10wk(42mm)	6.3cm	23.1cm	20.5cm	4.7cm	2.68cm	25.2
492	4792809	24yrs	1	0	0	0	not known	30/11/2017	26wks	30/11/2018	10wk(42mm)	6.2cm	22.3cm	20.8cm	4.6cm	2.76cm	26.4
493	4695973	21yrs	1	0	0	0	25/07/2017	01/05/2018	28wk+3day	01/05/2018	9wk(24mm)	6.7cm	26.3c,	22.6cm	5.3cm	3.31cm	27.4
494	4628807	21yrs	1	0	0	0	22/07/2017	28/04/2018	29wks+5days	28/04/2018	12wk+3days(56mm)	7.7cm	28.01cm	24.69cm	5.3cm	3.8cm	30
495	4690948	21yrs	1	0	0	0	16/09/2017	23/06/2018	26wk+2days	23/06/2018	11wk+6day(47mm)	6.3cm	2.29cm	20.3cm	4.45cm	2.68cm	26
496	3852869	25yrs	1	0	0	0	Unknown	24/07/2018	28wk+6days	24/07/2018	2.4cm(9wk)	7.2cm	27.5cm	22.6cm	5.6cm	3cm	28.6
497	4640644	22yrs	2	1	0	1	03/08/2017	10/05/2018	26wk	10/05/2018	4.03cm(10wk+6)	6.3cm	23.8cm	21.9cm	4.8cm	2.8cm	26.2
498	5001174	23yrs	1	0	0	0	10/04/2018	17/01/2019	33wk+4days	17/01/2019	8wk+1day(14mm)	7.6cm	27.6cm	24.9cm	5.8cm	3.28cm	30.2
499	4706976	25yrs	2	1	0	1	01/10/2017	08/07/2018	30wk+4days	08/07/2018	10wk(30mm)	7.3cm	27.1cm	23cm	5.5cm	3.7CM	33
500	4563269	21yrs	1	0	0	0	08/06/2017	15/03/2018	28wk+6days	15/03/2018	9wk(24mm)	7.01CM	26.27CM	22.59CM	5.58CM	3.57CM	29.6