"ESTIMATION OF EXPECTED FETAL WEIGHT USING SYMPHYSIO-FUNDAL HEIGHT AND ULTRASONOGRAPHY AND COMPARISON OF IT WITH ACTUAL BIRTH WEIGHT- A PROSPECTIVE STUDY"

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LIST OF ABBREVATIONS

ABW	-	Actual Birth Weight
AC	-	Abdominal circumference
AG	-	Abdominal girth
BMI	–	Body mass index
BPD	-	Biparietal diameter
ED	-	Emergency department
EFW	-	Estimated foetal weight
EFWFH	-	Estimated foetal weight based on fundal height
EFWFH+	-	Estimated foetal weight based on fundal height with clinical indicators
FL	–	Femur length
HC	-	Head Circumference
IUGR	-	Intrauterine growth restriction
LBW	-	Low Birth Weight
LGA	-	Large gestational age
POG	-	Period of gestation
SFH	-	Symphysio-fundal height
SGA	-	Small for gestational age
USG	-	Ultrasonography

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ABSTRACT

Background: Assessment of foetal weight is a vital factor in antenatal care, not only in the management of labour and delivery but also in identifying foetal weight disorders.

Objective: This study compared the accuracy of clinical methods (symphysio-fundal height) and ultrasonography in estimating foetal weight (EFW) with Actual Birth Weight (ABW) in term pregnant women.

Materials and Methods: This diagnostic test evaluation study was performed on 200 pregnant women 37 weeks gestational age or more admitted to the labour room at KLE's Dr. Prabharkar Kore Hospital and Medical Research Centre in Belagavi, between January 2023 December 2023. In this study, symphysio-fundal height measurements and ultrasonography were used to estimate foetal weight. Chi-square, and Pearson's correlation was used to compare the diagnostic value of fetal weight estimation methods.

Results: The study included 200 patients, with a mean age of 25.85 ± 2.29 years. Of these, 125 (62.5%) were over 25 years old and 75 (37.5%) were between 19 and 25 years old. Among the patients, 84 (42%) had experienced their first pregnancy, while 116 (58%) had experienced at least one previous pregnancy. The study found that the mean actual birth weight (2969.9 gms)was higher than the clinically estimated foetal weight(2908.2gms)

and ultrasound estimated foetal weight (2925.8 gms). Pearson's correlation test revealed a positive and moderate correlation between actual birth weight and clinically estimated foetal weight (r = 0.59, P= 0.001) as well as a significant correlation between actual birth weight and ultrasound estimated foetal weight(r= 0.52, P= 0.001).

Conclusion: The ultrasound method is better at determining actual birth weight than the clinical method. However, clinical estimation of foetal weight (by Johnson's formula) is easily accessible and affordable, and can be used in developing countries with poor resources.

Keywords: Term pregnancy, Symphysio-fundal height, Ultrasonography, Actual birth weight, Estimated birth weight.

INTRODUCTION

Fetal weight estimation during pregnancy is an important aspect of prenatal and intrapartum care.[1] During the end of pregnancy, accurately estimating foetal weight is especially crucial for planning the delivery, as complications during the perinatal period tend to be more common when the newborn's weight is either significantly above or below average. During regular checkups, the estimated weight of the fetus can influence decisions regarding the delivery method and timing of labour induction. Precise estimates are crucial because both maternal and perinatal risks may be associated with abnormal foetal growth. Delivering a macrosomic foetus is linked to extended labour and several delivery complications, such as brachial plexus injuries, shoulder dystocia, and intrapartum asphyxia, as well as enhanced risks for mothers, such as cervical injuries and postpartum haemorrhage.[2] Identifying a foetus with restricted growth is essential for establishing the optimal control interval and delivery time frame, which can help reduce perinatal risks, such as neonatal morbidity and intrauterine foetal death, predominantly when the foetus is not developing at a normal rate.[3] To ensure optimal perinatal management, obstetricians should employ an examination technique that accurately assesses fetal weight. The chosen method should be reliable, simple, and valid.

The factors influencing foetal growth include environmental, maternal, foetal, and placental factors. These include race, maternal age, parity index, sex of the baby, socioeconomic status, and maternal and congenital infections. Mothers of low socioeconomic status tend to have small babies.[4] Maternal height and weight gain influence foetal weight.[5,6] Maternal medical conditions such as diabetes mellitus, hypothyroidism, renal diseases, and anti-phospholipid antibody syndrome also influence foetal weight. Regarding fetal factors, fetal infections, chromosomal anomalies and the sex of the baby have an impact on foetal weight.[7-11]

Multiple methods to estimate foetal weight have been developed, ranging from a single biometric parameter to a combination of multiple parameters. Abnormalities in foetal growth can be detected clinically or by ultrasonography (USG). Clinical estimations measure various maternal body composition parameters to estimate foetal weight, including symphysio-fundal height and abdominal circumference. Simple methods, such as measurements of symphysio-fundal height (SFH) and abdominal girth (AG), can be used to predict expected foetal weight in low-resource settings. With the incorporation of multiple parameters, the error is decreased in comparison with results derived from abdominal circumference (AC) alone.[15] However, the accuracy of foetal weight estimation depends on several theoretical and practical factors, including the variability of foetal volume and density, the technique and skill of the operator, the scanner, and the formula used for calculation. The error is reported to vary from 15%,[16] 22 to 21.2%.[15] Ultrasound is used for the estimation of expected foetal weight and diagnosis of impaired growth. However, it is not easily available in all places offering obstetric care, particularly in low-resource settings. However, when sonographic measurement of the foetus is applied, the error increases.[17] However, the greatest error occurs at the extremes of foetal weight, with large gestational age (LGA) being mostly underestimated and SGA (small for gestational age) being mostly overestimated, or in the presence of diabetes or oligohydramnios.[18] This inaccuracy can be easily explained because among foetuses with an abnormal growth pattern, variation in density may be even greater than in the normal population, whereas reduced amniotic fluid can determine the deformation of the foetus, increasing the error of sonographic measurements. Foetal weight estimation using ultrasonography requires training, expertise, and expensive equipment. In situations like these, clinical methods for determining the weight of the foetus can be of considerable assistance in the decision-making process in obstetrics.[19]

Several clinical formulae based on measurements of symphysio-fundal height and abdominal girth have been developed. Johnson's formula for calculating fetal weight in vertex presentations was developed. The debate on the clinical utility of estimating fetal weight continues, as it is generally reliable in normal cases but often inaccurate in pathological instances, where it may lead to legal issues due to the association with incorrect "diagnostic errors" and unfavourable fetal outcomes. Consequently, most authors advise exercising caution when using the accuracy of foetal weight prediction for management decisions, particularly for foetuses large for gestational age.[20,21] The principal advantage of using clinical information and examinations to calculate foetal weight is that it is simple and does not require specialised equipment. Theoretically, obesity may interfere with the accuracy of prediction due to the increased abdominal wall thickness. This means that fetal weight may be overestimated in pregnant women with high BMIs and underestimated in those with low BMIs.[22] However, data regarding maternal BMI affecting the accuracy of fetal weight estimation were studied mostly from non-Asian populations.[22-24] The accuracy of ultrasound-estimated fetal weight has improved in the last decade, though a lack of consistency remains evident.

In our efforts to enhance the quality of obstetric care, it is crucial to precisely identify the most effective techniques for predicting a newborn's actual birth weight. This study aimed to determine the accuracy of clinical (SFH) and ultrasonographic methods for foetal weight and compare them with actual birth weight.

OBJECTIVE

Objective:

- To estimate the expected fetal weight in term pregnancy using symphysio-fundal height

  and ultrasonography.
- To compare the expected foetal weight with the actual birth weight.

REVIEW OF LITERATURE

The importance of accurately estimating foetal weight during pregnancy and labour has been widely recognised. By doing so, obstetricians can make informed decisions about the timing, mode, and location of delivery, which can reduce adverse pregnancy outcomes. Throughout history, several methods have been evaluated for their effectiveness in predicting actual birth weight. The accuracy of maternal self-estimation of foetal weight in literate, multiparous women has been found to be similar to both ultrasound and clinical predictions in full-term pregnancies, and none of these methods have been proven to be faultless.[26-28] Various clinical methodologies have been employed for predicting foetal weight in utero. J. Ojwang et al obtained a reasonable predictive value by utilizing the product of SFH (symphysis-fundal height) and AG (abdominal girth) measurements in centimetres, which were taken at various levels above the symphysis pubis. However, their results showed significant variation from the mean.[29]

Dare et al. utilized the product of the SFH and AG at the level of the umbilicus, measured in centimetres, as a means of EFW (estimating foetal weight) at term in-utero. The estimate was expressed in grams and showed a strong correlation with birth weight.[6] Alternative methods in clinical practice include the use of McDonald's equation, Johnson's method, and Dawn's formula.[30] There is currently no widely accepted method for determining foetal weight. Nevertheless, a formula proposed by Dare is occasionally utilised by certain experts in the field of clinical foetal weight estimation.[3,8] The popularity of using ultrasound to calculate foetal weight was attributed to the perceived capability to standardise and reproduce measurements consistently.[30,31] The benefit of this method is that it employs planar and/or linear measurement of foetal dimensions in utero, including BPD (biparietal diameter), AC (abdominal circumference), and FL (femur length), which are measurable with reproducibility and objectivity. Nevertheless, the technique may present difficulties depending on factors such as uterine abnormalities, mother's physique, placenta positioning, operator proficiency, and amniotic fluid volume. The biggest obstacle in applying functional ultrasound is the dearth of equipment and expertise in many health facilities, especially in primary health centres, where most deliveries occur. It has been demonstrated that the Hadlock regression formulae have a reasonable level of accuracy when it comes to estimating foetal weight, despite the existence of various sonographic equations that are based on foetal biometric measurements.[30,32]

The expectation that ultrasonography would provide an objective method for estimating foetal weight has not yet been realised. Research comparing the accuracy of clinical and ultrasonographic estimation of foetal weight has yielded inconsistent results. Although certain studies have implied that estimating foetal weight using ultrasonography is superior, particularly when the mother's BMI increases,[33] other studies have indicated that it is similar in accuracy to clinical procedures.[34]

The importance of maternal BMI (body mass index) in the accurateness of estimated foetal weight (EFW) is a crucial clinical factor to consider. Some research has shown that a high BMI (Body Mass Index) is connected to a decreased accuracy of clinical estimated foetal weight, while ultrasonographic estimation inclines to be very precise at higher BMI levels.[35,37] However, other studies have not found these associations.[38,39]

The impact of actual birth weight categories on the accurateness of both ultrasonographic and clinical foetal weight estimation is another crucial clinical factor to consider. Studies on this topic have yielded various findings. Research suggests that the clinical approach is most effective in determining foetal weight within the typical reference range of 2500 to 4000g.[27.40] The precision of clinical palpation in determining foetal weight for fetuses weighing under 2500g is low, whereas ultrasonography proves to be a more precise method compared to clinical procedures.[37,39,40]

A crucial element for a successful pregnancy is obtaining a precise estimate of foetal weight during the antenatal period. This is because both excessive and low birth weight can lead to complications during labour and the postpartum period. Complications that arise during the perinatal period and are linked to low birth weight are mainly attributable to IUGR (intrauterine growth restriction) or foetal prematurity. Newborns who are underweight are often classified based on their birth weight alone:

- Low birth weight: 1501 to 2500 g
- Very low birth weight: 1001to1500 g
- Extremely low birth weight: 500 to 1000 g

Although the definition of excessive birth weight varies, it is generally agreed that a birth weight of over 4000 g constitutes foetal macrosomia. Perinatal complications that may arise due to excessive birth weight include:

- Shoulder dystocia
- Brachial plexus palsy
- Bone injuries/fracture
- Prolonged labour
- low Apgar scores/ Birth asphyxia
- Forceps/vacuum extraction
- Birth canal/perineal lacerations
- Postpartum haemorrhage
- Cephalopelvic disproportion
- Cesarean delivery

Birth weights vary

The Mean birth weight of a baby can be characterised as a function of gestational age. Standard foetal growth curves were employed for estimating the range of anticipated foetal weight for the population of women at any gestational age. However, these curves cannot be applied to individual women specifically, as there are differences in foetal weight and birth weight among neonates of various racial backgrounds. For determining the reference range for term birth weight, it is advisable to study foetal weights at both ends of the spectrum, specifically those below the 5th percentile, and to establish the point at which neonates differ significantly from the mean in terms of their occurrence of perinatal death and perinatal complications.

Factors influencing the birth weight

The following extrinsic and endogenous factors may influence foetal birth weight.

- Gestational age during delivery, foetal sex
- Maternal race, weight, height, pregnancy weight gain, parity and physical activity, concentration of haemoglobin, uncontrolled diabetes, use of tobacco, preeclampsia, hypertension
- Paternal height
- Ambient altitude

Techniques used in estimating fetal weight

The precision of various techniques for estimating foetal weight is dependent on the gestational period and range of birth weights being analysed. However, the current techniques for determining foetal weight in utero have significant predictive errors, especially when considering the two extremes of foetal weight (for example, less than 2500 g, which is probably the result of premature deliveries, and more than 4000 g, which puts the foetus at risk for foetal macrosomia-related complications). These methodologies involve the following steps:

- Tactile assessment
- Assessing clinical risk factor
- Maternal self-estimation
- Obstetric ultrasonography

Significance of Antenatal Fetal Weight Estimation

Both high fetal weight and low birth weight at the time of delivery are linked to an elevated risk of complications to newborn during labour and the postpartum period.[41,42]

Perinatal complications linked to low birth weight are frequently attributed to premature foetuses, but they might also occur due to intrauterine growth restriction sometimes.[43] For pregnancies involving macrosomic foetuses (see image below), potential delivery-related complications may arise, including brachial plexus injuries, shoulder dystocia, intrapartum asphyxia, and bony injuries, as well as risks to the mother, such as birth canal and pelvic floor damage and postpartum haemorrhage.[41,42]

The prevalence of cephalopelvic disproportion tends to rise as foetal size increases, leading to a higher rate of both caesarean and operative vaginal deliveries for macrosomic foetuses compared to those of normal weight. [41,42]

Fetal weight categories

Foetal weight can be classified into one of three categories: (1) within the reference range, which is typically defined as the 10th to 90th percentile for gestational age; (2) SGA (small for gestational age), meaning below the 10th percentile; or (3) LGG (large for gestational age), meaning above the 90th percentile. The data in Table

1 show the normal Birth Weight percentiles for the respective gestational ages, including the 3rd, 5th, 10th, 50th, 90th, 95th, and 97th percentiles.

Table 1: Centiles for fetal weight according to gestational age

Gestational age (exact weeks)	Centiles						
	3rd	5th	10th	50th	90th	95th	97th
22	463	470	481	525	578	596	607
23	516	524	538	592	658	680	695
24	575	585	602	669	751	778	796
25	641	654	674	756	858	891	913
26	716	732	757	856	980	1020	1048
27	800	818	849	969	1119	1168	1202
28	892	915	951	1097	1276	1335	1375
29	994	1021	1065	1239	1452	1521	1569
30	1106	1138	1190	1396	1647	1728	1783
31	1227	1265	1326	1568	1860	1953	2016
32	1357	1401	1473	1755	2089	2195	2266
33	1495	1547	1630	1954	2332	2450	2529
34	1641	1700	1795	2162	2583	2713	2800
35	1792	1860	1967	2378	2838	2978	3071
36	1948	2024	2144	2594	3089	3237	3335
37	2106	2190	2321	2806	3326	3480	3582
38	2265	2355	2495	3006	3541	3697	3799
39	2422	2516	2663	3186	3722	3876	3976
40	2574	2670	2818	3338	3858	4006	4101

Until the foetus is born, the only methods that are useful for assessing its size in utero are those that can be classified into these categories. Depending on the population of patients assessed to establish percentiles, the standards might be misled if applied to other groups of pregnant women. For example, if the standard birth weight curves for Caucasian women are applied incorrectly to women of African-American origin, it can result in a higher proportion of newborns with birth weights below the 10th percentile for African-American neonates compared to an aptly matched Caucasian neonate group.

Complications

Several authors from distinct eras have employed the "low birth weight" term to describe a range of foetal weights spanning varying measurements. Improvements in neonatal care over the past quarter-century have led to improvements in adverse outcomes for newborns weighing 2000 to 2500 g, which were previously associated with high levels of neonatal mortality and morbidity.[44]

A contemporary approach to classifying newborns that are underweight is on the basis of foetal weight alone. Using this classification system, neonates can be grouped according to their weight to evaluate their susceptibility to neonatal complications as follows: (1) weighing in the 1501–2500 g range is classified under low birth weight, (2) 1001to 1500 g weight is classified under very low birth weight, or (3) weighing in the 500–1000 g range is classified under extremely low birth weight.

Subclassifications can be made within these weight groups based on the neonatal mortality and morbidity incidence in each group and newborn's gestational age, especially those with extremely low or very low birth weight.[45] Accurately categorising foetuses into these three broad groups before delivery can aid in prediction and potentially prevent complications in neonates that are underweight.

Fetal macrosomia

The phrase "fetal macrosomia" refers to a condition in which the foetus is abnormally large in size.

Figure 1: Photograph of a macrosomic newborn soon after birth.

The appropriate usage of this designation refers to the mean foetal and maternal dimensions in a specific population. Regrettably, it's been arbitrarily and inconsistently defined depending on the author and era, including birth weights greater than 4000 g (8 lb 13 oz), greater than 4100 g (9 lb), greater than 4500 g, or more than 4536 g (10 lb) for all expecting women. [41,42] The incidence of fetal macrosomia, which is characterized by a birth weight exceeding 4000 g, is influenced by factors such as socioeconomic status, ethnicity, and race in the population being investigated., with prevalence ranging from 2 to 15% in pregnant women.[46,47]

Two aspects of size of foetus before delivery that are of interest to clinicians are the absolute and relative sizes of the foetus.

The primary concern is absolute foetal size, which includes the actual dimensions and/or weight of the foetus. This information is crucial for evaluating perinatal mortality and morbidity risk; however, it is challenging to obtain accurate results before delivery.

The second consideration is the comparison of the size of the foetus to the reference data, which includes the relative foetal dimensions and/or foetal weight relative to a particular group. It is crucial to assess whether foetal macrosomia or IUGR (intrauterine growth restriction) exists in comparison with a previously established standard for a specific group of women, as both conditions are indicators of perinatal mortality and morbidity. Establishing these determinations with precision before delivery is a challenging task, as it relies not only on the precise estimation of the absolute foetus's weight and/or size but also on the selection of a proper reference group for comparison. Thus, precisely determining the relative foetal weight and/or size is a remarkably challenging yet crucial prerequisite for permitting interpretation of the absolute foetal weight and/or size within a clinically meaningful context.

Factors that Contribute to Fetal Weight Differences

Various extrinsic and endogenous factors can influence the weight of a fetus. These include maternal factors (for example, stature, race, genetics),[48,49] paternal factors (for example, paternal height),[50,51] environmental influences (for example, adequate nutrition availability, altitude, degree of physical activity),[52,53] physiologic factors (for example, haemoglobin concentration, microvascular integrity, altered glucose metabolism),[54,55] pathologic factors (for example, uterine malformations, hypertension),[56,57] and pregnancy complications (for example, preeclampsia, gestational diabetes mellitus).[58.59]

Shah's systematic review of thirty-six studies revealed that, along with paternal height, other characteristics linked to low birth weight included low paternal birth weight, paternal occupational exposure, and extreme paternal age, as well as low levels of education.[60]

The most crucial factors in determining the weight of a newborn are maternal race and gestational age at the delivery time. In pregnancies without complications, maternal race and gestational age are followed by various significant environmental, parental, and pregnancy-specific aspects that impact birth weight. These comprises: (1) maternal height, (2) maternal obesity, (3) maternal pregnancy weight gain, (4) parity, (5) fetal sex, (6) ambient altitude, (7) maternal haemoglobin concentration, (8) paternal height, (9) smoking cigarette, and (10) glucose tolerance.[51,61,62]

Other maternal illnesses and pregnancy complications

Several maternal health issues and pregnancy complications are linked to reduced birth weight. The most prevalent of these are preeclampsia and chronic hypertension during pregnancy.[63]

Techniques for fetal weight estimation

None of the existing techniques for estimating foetal weight in utero is free from significant predictive errors. These errors are particularly significant for babies weighing less than 2500 g and more than 4000 g, as they are prone to complications arising from premature birth and foetal macrosomia, respectively.

The two primary techniques employed in present-day obstetrics to predict birthweight are (a) clinical methods that rely on the abdominal palpation of fetal parts and calculations on basis of fundal height, and (b) sonographic assessments of fetal skeletal parts that are subsequently inserted into regression equations to obtain an estimated fetal weight.[64,65] Some researchers believe that sonographic estimates are superior to clinical estimates, while others have found that both techniques provide similar accuracy levels when compared side by side.[66,67]

SYMPHYSIS FUNDAL HEIGHT (ALSO KNOWN AS THE FUNDAL HEIGHT)

Symphysis-fundal height (SFH) is a widely used method for screening gestational age and foetal growth after 24 weeks of pregnancy. This process involved placing a tape measure over the mother's abdomen. The measurement should be performed when the mother's bladder is empty. The distance between the top of the pubic bone (symphysis pubis) and the top of the pregnant uterus (fundus) was expressed in centimetres (cm). (Figure 2) The symphysis-fundal height in centimetres must be equivalent to gestational age in weeks. (Figures 3 and 4) A discrepancy in measurement of more than 3 cm may indicate issues with fetal growth, a transverse lie, abnormal levels of amniotic fluid, a twin pregnancy, or the presence of uterine fibroids.[68,69]

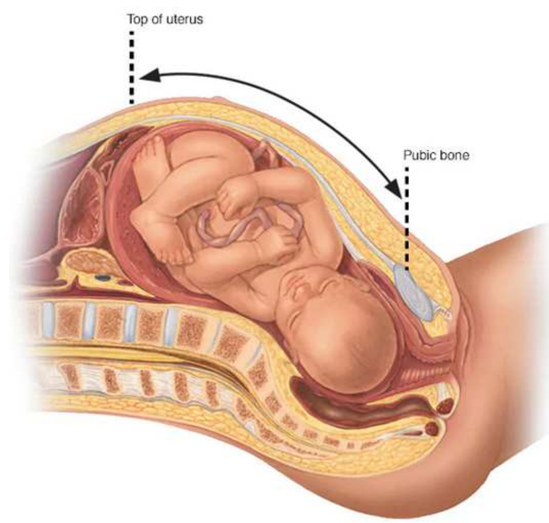

Figure 2: Fundus height

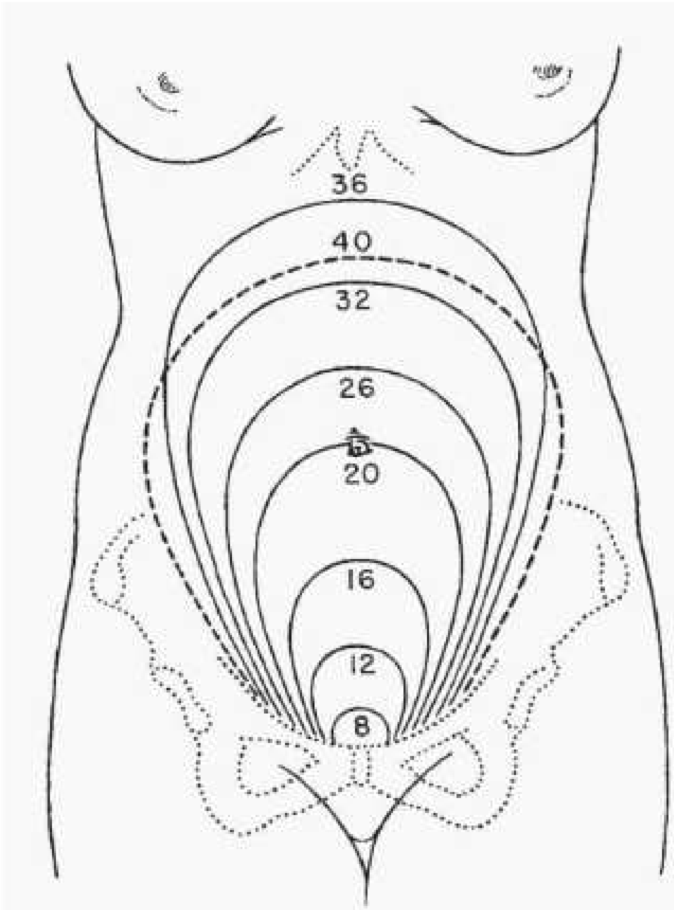

Figure 3: Symphysio-fundal height corresponding to gestational age

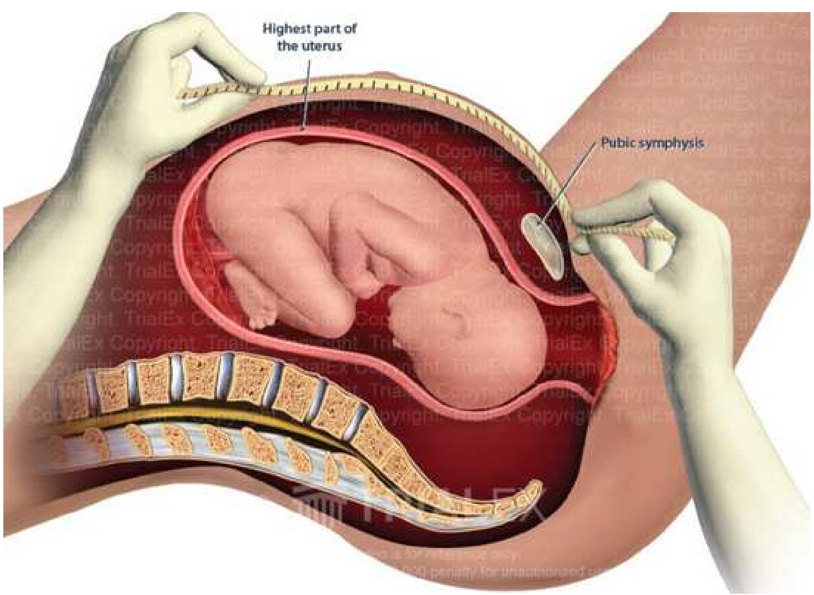

Figure 4: Measurement of Symphysio fundal height

Johnson's formula

A formula for estimating foetal weight in utero, specifically when the presentation is a vertex, was provided by R.W. Johnson.[70]

[Symphysio fundal height in cm - y] x 155 = weight in grams

where y=13 when the head is not engaged

y=12 when the head is at "0" station

y=11 when the head is at +1 station

When a mother's weight exceeded 91 kg, 1 cm was deducted from her fundal height.

A study conducted by Johnson found that the estimated foetal weight calculated using their formula was within 353 g of the actual birth weight in 68 percent of the two hundred cases analysed.

This study was conducted by Numprasert in 2004 and included 400 patients. Among the patients, 42.75% were female infants, and 52.25% were male infants.

The mean estimated weight of the baby according to the Johnson method was 3318.6 ± 351.72 grams, with a difference of approximately 750 to ±530 grams compared to the actual weight.72 percent of estimated fetal weight was within 10 percent of the actual birth weight. In conclusion, SFH can be utilized with more accuracy in estimating fetal weight.[71]

A study found the sensitivity of SFH measurement to be lower than 35% for identifying abnormal intrauterine growth.[72] Roex A, et.al. discovered that the sensitivity of fetal growth abnormality detection through serial plotting of SFH on customized charts can enhance the measurement of SFH.[73] The findings of a Cochrane review indicate that there is currently insufficient evidence to establish the effectiveness of SFH measurement in identifying IUGR. Consequently, it is impossible to propose modifications to existing practices. The need for additional trials is highlighted by these results."[74] If circumstances arise where there is an increased risk for IUGR (intrauterine growth restriction) or symphysio-fundal height is unreliable due to factors such as twin pregnancy, maternal obesity, polyhydramnios, or the occurrence of uterine leiomyomas (fibroids), ultrasonography could be a more effective screening tool for identifying foetal growth problems.

OBSTETRIC ULTRASOUND

In the 1960s and the 1970s, obstetricians initially employed ultrasonography to detect early intrauterine pregnancies. By the 1990s, emergency physicians had adapted this technology for point-of-care use. Ultrasound is a non-invasive diagnostic method that can rapidly verify intrauterine pregnancy at the patient's bedside, thereby considerably reducing the length of stay in the ED (emergency department) for pregnant women. [75] Emergency medicine providers can achieve the highest diagnostic potential in the first trimester of pregnancy by utilizing point-of-care pelvic ultrasound.[76,77]

Principles of USG

The application of ultrasound in clinical settings is contingent on sound propagation. This involves the transmission of a short burst of energy into the body, which then propagates through tissue. Acoustic pressure waves can propagate in a direction perpendicular to the direction of the dispersed particles, resulting in transverse waves, whereas sound propagates along the direction of particle movement, resulting in longitudinal waves. This occurs in tissues and fluids. The velocity at which sound waves travel through tissues depends on their physical characteristics, including resistance to compression, density of the medium, elasticity, and stiffness. Propagation velocity is a key factor in determining how sound waves move through different materials. The velocity is higher when the density is lower and when the stiffness is greater. In normal tissues, the velocity at which sound waves travel is 1540 m/s, whereas in tissues such as aerated lungs and fat, the velocity decreases. However, in tissues such as the bone, the speed is faster.

The fundamentals of ultrasound include echo ranging and precise measurement of time. By propagating an ultrasound pulse into the body and measuring the time until the echo wave returns, it is feasible to determine the depth of the interface that reflects the sound. In a homogenous medium, sound travels without encountering any interfaces to reflect it and the medium appears anechoic. Acoustic interfaces are present at the point where different tissues meet distinct physical properties. This enables the precise identification of tissues. The principles that are involved in this process are spectral reflection, refraction, and attenuation.[78]

Fetal weight measured through ultrasound

Several algorithms can be applied in estimating the weight of the foetus. The most commonly utilised algorithms include BPD (Biparietal Diameter), HC (Head Circumference), AC (Abdominal Circumference), and FL (Femur Length). (Figure 5) These measurements were incorporated into a formula to determine baby's weight and size.

Biparietal Diameter: This is known also as the measurement between the sides of a baby's head. It is vital to notice that even babies who weigh the same weight can have varying head sizes.

Head Circumference: This algorithm measures the circumference of the baby’s head.

Abdominal Circumference: This procedure involves determining the circumference of the foetal abdomen. To do so, healthcare professionals will utilise a measuring tape to calculate the distance between the pubic bone and the upper edge of the belly.

Femur Length: The measurement of the body's longest bone, which is the femur or thigh bone, is taken using its length.

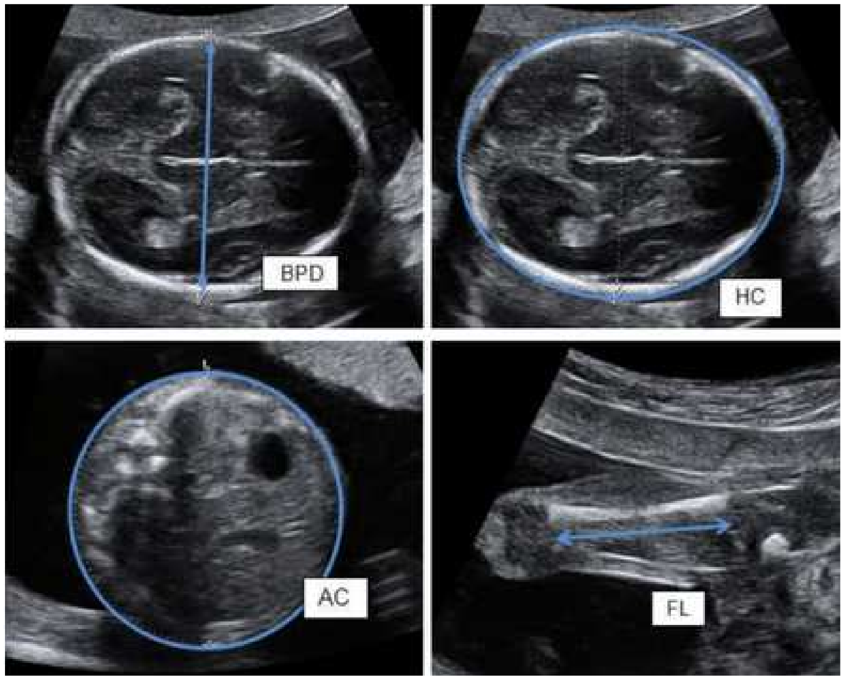

Figure 5: Measurements used to calculate fetal weight

According to Grove (2017), it is crucial to recognise that errors can occur when estimating a baby's weight. Findings revealed that there might be a discrepancy of approximately 15% in calculating the weight of a newborn.[79] By the first half of pregnancy, estimating the baby's weight is generally more precise, as the foetus is smaller and simpler to measure. Conversely, the closer you are to the due date, the less reliable the measurements become.

As per research and studies, it is generally observed that the estimated fetal weight obtained through ultrasounds is usually higher than the baby's birth weight.[80] A reason for this is the retention of amniotic fluid within the womb. After the baby is born, fluid is typically lost within the first few days of life, resulting in a disparity between the estimated ultrasound weight and birth weight. One need not be concerned about weight loss after birth, as this is a normal occurrence and weight is typically regained slowly each day.

Actual birth weight

The weight of an infant at birth is a crucial determinant of health. Typically, babies born between 37- and 41-weeks' gestation (full-term babies) weigh around seven pounds (3.2 kg) on average. Generally, both small and very large babies are more prone to encounter difficulties. It is common for newborns to lose up to 10 percent of their birth weight in the first few days of life. For instance, a baby who weighs 7 pounds 3 ounces at birth may lose up to 10 ounces during this time.

Assessment of foetal birth weight

The weight of a child wearing minimal light clothing was determined using an electronic weighing scale. (Figure 6) The weighing scale was adjusted to eliminate any zero errors before measuring the weight. Measurements of weight should be conducted serially on the same scale.[81]

Figure 6: Electronic weighing machine for estimating fetal weight

A prospective investigation was conducted by Shittu et al. in the year 2007 at the Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife, Nigeria, with the aim of assessing the accuracy of ultrasonographic and clinical foetal weight estimations at term. A total of 100 expected women got their foetal weight assessed separately using both ultrasonographic and clinical techniques, as they met the inclusion criteria. The precision of the estimates was evaluated based on absolute percentage error, percentage error, and the proportion of estimates within 10 percent of the actual birth weight (which was +10% of the birth weight). The research findings indicated that the study sample's actual average birth weight was 3,255+622 (ranging from 2,150 to 4,950) grams. In general, the clinical method tended to overestimate birth weight, whereas ultrasonography appeared to underestimate it. The clinical method had a mean absolute percentage error smaller compared to the sonographic technique, and the number of estimations (70 percent) within 10 percent of the actual birth weight was higher compared to the sonographic technique (68 percent). However, no statistically considerable differences were seen. In the group of infants weighing less than 2,500 g belonging to the low birth weight category, the mean errors in the estimates provided by ultrasound were considerably smaller, and a significantly larger proportion of these estimates (66.7%) fell within 10 percent of the actual birth weight compared to those obtained through clinical methods (41.7%). There was no statistically significant difference in the accuracy measures for babies weighing within the normal range of 2,500-3,999 grams and in the macrosomic group (with 4,000 g or more), with the exception of the ultrasonographic method, which underestimated birth weight, whereas the clinical technique overestimated it. The level of precision in estimating birth weight through clinical assessment is similar to that of routine ultrasonography, except in cases involving low birth weight infants. Based on the study's results, it is clear that if the clinical method indicates a weight of < 2,500 g, a subsequent sonographic estimation is advisable to improve the prediction and assess the foetal well-being more accurately.[82]

In 2017, **Itarat et al.** conducted a cross-sectional study for evaluating the accurateness of birth weight estimations calculated by multiplying the SFH (symphysio-fundal height) and AC (abdominal circumference) for various pre-pregnancy body mass indices (BMI) at two tertiary hospitals. The researchers enrolled pregnant women who were carrying a single foetus in a vertex presentation, had a gestational age between 24 and 42 weeks, had intact membranes, and were predicted to give birth within twenty-four hours of admission. Patients were classified into four categories based on their pre-pregnancy Body Mass Index (BMI) using criteria specific to Asian populations. Trained nurses in each hospital measured the fundal height, which was obtained by measuring from the upper border of the symphysis pubis to the tip of the uterine fundus. The AC was then measured at the umbilical level with the help of measuring tape marked in centimetres. This study was performed without uterine contractions. The findings revealed that 432 pregnant women were enrolled. The Spearman correlation coefficients for the relationship between foetal weight, calculated from the product of AC and SFH, and actual birth weight in the underweight, normal-weight, overweight, and obese groups were 0.44, 0.54, 0.59, and 0.71, respectively. No substantial effect of pre-pregnancy BMI was observed on the precision of estimating birth weight when parity, maternal age, and gestational age were considered. The research indicated that the pre-pregnancy Body Mass Index (BMI) had no substantial impact on the precision of foetal birth weight estimations derived from the product of abdominal circumference and symphysio-fundal height.[83]

Pavitra et al. (2022) conducted a prospective comparative study at the Obstetrics and Gynecology Department and Radio-diagnosis of GSL Medical College to evaluate the accuracy of methods for estimating foetal weight, with the aim of assisting decision-making during emergencies when ultrasound is not readily available, as well as reducing the burden on sonologists in such situations. A comparison was made between the foetal weights determined using ultrasonographic and clinical methods and their actual values. The research findings revealed that two individuals gave birth to infants which weighed between 1.5 and 2 kg, 13 patients had babies which weighed between 2.1to 2.5 kg, twenty-nine patients delivered children which weighed between 2.6 and 3.0 kg, 21 patients gave birth to babies which weighed between 3.1 to 3.5 kg, and five individuals had babies who weighed between 3.6 and 4.0 kg. Hadlock and Dare's equations predicted the mean birth weight to be 2.90 and 3.07 kilograms, correspondingly. These research findings suggest that the use of USG to estimate foetal weight is not superior to clinical assessment when it comes to predict foetal weight. Clinical evaluations appear to be just as precise as ultrasonic evaluations in cases where ultrasound is unavailable.[84]

In 2009, Kayem et al. compared the diagnostic efficacy of fundal height and foetal abdominal circumference determined by sonography in predicting low and high birth weights in routine practice from 37 to 41 weeks of gestation. Data were acquired from a multicentre study of 19 415 women in Belgium and France. This research encompassed 7138 low-risk women from Population A, who had their fundal height measured not more than eight days before giving birth. A further 1689 females who had both fundal height and foetal ultrasound measurements taken not exceedingly more than eight days prior to delivery (Population B) were also included. Using population A, the parameters of the formulas designed for estimating foetal weight based on fundal height alone (EFWFH) or fundal height in conjunction with additional clinical indicators (EFWFH+) were determined. Foetal weight estimation through ultrasound was performed by calculating the foetal abdominal circumference using the equation provided by Campbell and Wilkins. The evaluation of the relationship between the estimated foetal weight based on each formula and birth weight was conducted in Population B. Additionally, the diagnostic value of each method for predicting birth weight ≤2500 g or ≥4000 g was also compared.

The correlation between EFWAC and birth weight was stronger than that of either EFWFH or EFWFH+. The sensitivity of EFWAC in screening neonates weighing ≤2500 g, with a specificity of 95%, was notably higher compared to that of EFWFH+ (50.7% vs. 40.4%, $P < 0.05$) or EFWFH (50.7% vs. 41.2%, $P < 0.05$). Likewise, its sensitivity in predicting a birth weight ≥4000 g was notably greater than that of either EFWFH+ (54.0% vs. 45.1%, $P < 0.05$) or EFWFH (54.0% vs. 37.1%, $P < 0.05$). The researchers found that measuring the fetal abdominal circumference using sonography is more effective in predicting both low and high birth weight than relying on clinical inspection on basis of fundal height at routine check-ups between 37 and 41 gestation weeks.[85]

In 2016, Cajethan Ife Emechebe conducted a research project aimed at predicting the birth weights of infants at term in a low-resource environment. The present study evaluated the efficacy of Dare's clinical method in comparison with ultrasonography (USG) by examining 200 healthy, singleton pregnant women. 3242±508 gm was the mean actual birth weight. The difference between the mean absolute percentage errors of the clinical procedure (11.16%±9.48) and the ultrasound method (9.036%±7.61) was not statistically significant (P=0.205). The outcome revealed no disparity in the measurements obtained by ultrasound and clinical methods for both macrosomic and normal-weight babies. However, in the case of low-birth-weight infants, ultrasound estimations were more precise and thus been recommended.[86]

According to research conducted by **Tomar et al. (2017),** foetal weight was compared using two clinical procedures with ultrasound. The results indicated that the mean error of the ultrasound method was less than that of the Johnson's formula. Fewer errors were discovered in relation to Dare's formula compared to Johnson's formula, and the level of error in Dare's formula was similar to that of birth weight measured using ultrasound. The percentage error of USG and Dare's formula was 15% in 95% of cases, while Johnson's formula had a 20% error in 95% of cases. In comparison, Johnson's formula exhibited the Maximum SD, while Dare's formula showed the minimal SD, followed closely by ultrasonography with a 20.2 grams difference. As a result of this research, USG-derived EFW has gained widespread usage, as it more reproducible.[87]

A study was conducted by **Ingale et al. in 2019** at a tertiary care hospital's Obstetrics and Gynecology department. This study aimed to evaluate the accuracy of foetal weight estimates at term by comparing ultrasonographic and clinical techniques with actual birth weight. **This research project focused on estimating the weight of foetuses in singleton pregnant women with vertex presentation and term gestation (between 37 and 42 weeks) who had their gestational age confirmed through ultrasound scans and dates and were admitted to a tertiary care centre.** Patients with oligohydramnios, Polyhydramnios, Antepartum haemorrhage, congenital anomalies of the foetus, or obesity (body mass index >30 kilogram/meter2) were excluded from the study. Foetal weight estimation is typically performed using clinical methods and ultrasonography. An electronic weighing machine was used to record birth weight in grams after delivery, and the data are presented in tabular form. This study revealed that both ultrasonographic and clinical assessments exhibited a strong association with ABW (actual birth weight). Both methods displayed greater sensitivity in the 2500–4000 g birth weight range than in the <2500g and > 4000 g categories. Overall, the clinical procedure exhibited a smaller mean absolute percentage error than the sonographic method, with values of 7.2±7.7 and 16.2±11.1, respectively. In the group of infants weighing less than 2,500g, that is, low birth weight, the mean absolute percentage error using ultrasound (USG) was 9.0±11.3. Similarly, the mean absolute percentage error using clinical assessment was 11.7±9.0. No statistically considerable differences were seen between the 2 techniques. This research demonstrates that the process of clinically estimating birth weight is as precise as using routine ultrasonography. Clinical palpation should be regarded as a dependable diagnostic tool for foetal weight estimation and is equally reliable when performed by a skilled medical professional. This technique is inexpensive and simple to implement. The requirement is to practically incorporate it into obstetrics and direct managerial decisions.[88]

In 2019, Preyer et al. conducted a study comparing the accurateness of foetal weight estimation with the use of USG and clinical examination in relation to BMI. In this prospective, double-blinded observational study, the researchers assessed the clinical method's accuracy in comparison to ultrasound measurement for estimating foetal weight, using ABW as the gold standard. Among all patients who presented for delivery at ≥37 weeks and were involved in the cohort, the examination was conducted using Leopold's manoeuvres and ultrasound to estimate foetal weight. All midwives and physicians who served as examiners had roughly equivalent levels of professional experience. The primary study objective was to evaluate the effectiveness of ultrasound and Leopold's manoeuvres in estimating birth weight by comparing the overall absolute error, overall absolute percentage error, and absolute percentage error exceeding 10% and 20% against the actual birth weight, which served as the gold standard. This comparison was conducted separately for normal weight and overweight pregnant women. The data analysis consisted of five hundred forty-three patients, and it was found that the accuracy of foetal weight estimation was considerably higher when using ultrasound than when using Leopold's manoeuvres in all absolute error calculations for expecting women who are overweight. There was no statistically considerable difference in the accuracy of estimating foetal weight between Leopold’s manoeuvres and ultrasound in normal-weight expecting women for all error calculations. The findings from our blinded observational study revealed that ultrasound demonstrates a significantly higher level of accuracy when estimating foetal weight among overweight pregnant women, as opposed to Leopold's manoeuvres. A notable difference in the absolute error exists between the two methods. The researchers did not find any significant difference in accuracy between USG and Leopold's manoeuvres in women having normal weight.[28]

Mossayebnezhad et al. in the year 2020 assessed the accuracy of ultrasonography and clinical methods in EFW compared with ABW in term pregnant women. This study, which aimed to evaluate the diagnostic test, was conducted on 247 single-term pregnant women who were admitted to an educational and therapeutic hospital in Rasht City, Iran. In this investigation, abdominal palpation, Insler's formula, USG and Johnson's formula, were made use to estimate foetal weight. The Bland-Altman plot was utilised to estimate the accuracy of tests by assessing sensitivity and specificity in foetal weight groups, which comprised those below 2500 g, between 2500-4000 g, and above 4000 g. The study revealed that the pregnant women who took part in the research had a

Mean±SD of 28.86±4.24 years, 32.98 kg/m2 BMI, and 39±1.04 weeks of gestational age. 3343.352±432.799 gr was their Mean±SD actual birth weight. Also 3371.053±345.561 gr was the Mean±SD birth weight found by abdominal palpation, 3041.206 ±411 gr was the Mean±SD birth weight using Johnson's equation, 3556.316±531.567 gr by using Insler's formula, and 3294.28±380.09 gr was noted through ultrasonography. According to the one-sample t-test, abdominal palpation showed the smallest difference (P=0.261), while Insler's formula showed the largest discrepancy (P=0.001) in comparison with ABW. Concerning the classification of foetal weight, Insler's formula demonstrated an exceptionally high level of accuracy (96.33%) in identifying LBW (Low Birth Weight) infants. In contrast, abdominal palpation proved to be a more reliable method (91.09%) for identifying infants with macrosomia and normal weight (94.72%). The study found a substantial dissimilarity between clinical techniques and ABW (P=0.026). The research concludes that clinical methods are cost-effective, and accessible options for estimating fetal weight in developing countries, particularly in our nation.[89]

In 2020, Odekunle et al. conducted a study evaluating the accurateness of the product of SFH and AG in birth weight estimation among expecting women in Keffi, Nigeria. The study comprised expectant mothers who were admitted to the Federal Medical Centre in Keffi, Nigeria, for giving birth. A systematic random sample of 153 women with a single full-term foetus was chosen for this study. An interviewer-led questionnaire was utilized to collect socio-demographic information and medical and obstetric histories. SFH and AG measurements were employed to determine the estimated foetal weight, which was subsequently compared with ABW. The use of absolute percentage error was made to evaluate the overall predictive error of the Dare's formula. The research findings indicated that the patients' mean age was 29.65 ± 5.15

years. 39.5 ± 1.2 weeks was the mean gestational age. A considerable correlation ($r = 0.52$, $P < 0.001$) was observed between ABW and estimated foetal weight. Ninety (66.2%) of the babies were of normal weight, and six (85.7%) of the macrosomic babies were predicted correctly. None of the babies born with low birth weights were accurately predicted using this formula. Research indicates that Dare's formula is accurate in predicting the weight of normal and macrosomic infants but is less precise in predicting the weight of LBW (low birth weight) infants. [90]

In the year 2021, Ezeugo et al. conducted a prospective comparative study at a tertiary hospital in Abuja, Nigeria, comparing the accuracy of ultrasonographic and clinical estimation of foetal weight at term in birth weight prediction. A total of 300 women expected to give birth were enrolled in this study. The researchers used Dare's clinical method and the Hadlock 3 formula to estimate the foetal weight of babies in utero. Newborn infants were weighed within half an hour after birth. The difference in accuracy between the ultrasonographic method, which achieved a rate of 82.3%, and the clinical method, which achieved a rate of 75.3%, was statistically significant (p-value=0.023). The clinical method for parturient with a BMI of <30 kg/m2 and ≥30.0 kg/m2 achieved the accuracy rates of 83.5% and 68.5%, correspondingly, while the ultrasonographic method achieved accuracy rates of 85.2% and 80%, correspondingly. According to Ezeugo et al., estimation of foetal weight using ultrasonography is more precise than clinical techniques. Nevertheless, the clinical approach might be employed when there is unavailability of ultrasound scan.[91]

Gurung et al. conducted a study in the year 2022 to examine the accuracy of clinical procedure in estimating fetal weight with sonography as well as with ABW. A total of 150 women who met the inclusion criteria were included in this study. Foetal weight was estimated using the Johnson's formula as a clinical method. Subsequently, the women underwent ultrasound examination, and the Hadlock method was used to estimate foetal weight through sonographic means. The study outcome revealed a considerable correlation between the actual birth weight and ultrasonographic birth weight, as demonstrated by the comparison of the two estimated foetal weights (P=0.01). The correlation between clinical birth weight estimation and ABW was less significant (P=0.638). Consequently, the study demonstrated that in determining ABW, the USG method is more effective than the clinical method. Therefore, it is recommended that ultrasound be utilized whenever feasible.[92]

In 2023, Mukhtar et al. conducted a prospective observational study for estimating foetal weight during full-term pregnancies with the aid of ultrasound and clinical methods. They also aimed to determine the relationship between estimated weight and actual birth weight. All expected women who underwent antenatal check-ups and those admitted to the obstetric ward who met the inclusion criteria were enrolled in the study. These individuals were subjected to clinical assessment and diagnostic tests, and information was recorded on a pre-prepared form. During routine antenatal visits of pregnant women, all measurements were thoroughly documented, and the estimated foetal weight was calculated using the abdominal girth (AG) multiplied by the symphysio-fundal height (SFH), in addition to the Hadlock method. Following delivery, the weight of the foetus was compared with the calculated values. The mean weight estimated by AG × SFH was 2862.67 ± 327.37, and that by the Hadlock The study involved 500 pregnant women with singleton pregnancies, and the average actual birth weight was 2758.19 ± 341.25. The estimated foetal weight (EFW) using the AG × SFH method had a p-value of 0.699, whereas the p-value for the Hadlock method was 0.669. The average error was 104.50 gm when using the AG × SFH method, compared to 143.9 gm with the Hadlock technique. The mean percentage errors were 5.1% and 3.8% for the Hadlock and AG × SFH methods, respectively. The results showed that the SD (standard deviation) was lowest for AG × SFH (197.85), followed by USG (219.61). Correlation analysis demonstrated a substantial positive correlation between the birth weight of the foetus and the estimated birth weight for both methods. Based on the study results, the authors assert that the clinical procedure for estimating foetal weight at term is as precise as ultrasonography to estimate foetal weight. It can be routinely utilized during the term gestation. This is especially beneficial in areas where ultrasound machines or skilled professionals capable of conducting ultrasound examinations are not readily accessible.[93]

The majority of research on foetal weight measurement by clinical examination versus ultrasound and its comparison with ABW has been conducted in non-Asian populations. The study objective was to evaluate the accuracy of the clinical method for SFH compared with ultrasonography and ABW in pregnant women at term. The purpose of this comparison was to facilitate informed decision-making in the management of pregnant women.

MATERIALS AND METHODS

Source of data:

This cross-sectional observational study was conducted in the Department of Obstetrics and Gynaecology at KLE's Dr. Prabharkar Kore Hospital and the Medical Research Centre in Belagavi. Ethical clearance was granted by the JNMC Institutional Ethical Committee Belagavi. The study lasted for one year, starting in January 2023 and concluding in December 2023. The study included expecting women aged between 37 weeks and 41 weeks and 6 days POD (period of gestation) who were admitted to KLE's Dr. Prabhakar Kore Hospital and Medical Research Centre in Belagavi.

Study design:

This cross-sectional observational study was conducted at the KLE's Dr. Prabhakar Kore Hospital and Medical Research Centre in Belagavi.

Selection Criteria:

The following inclusion and exclusion criteria were utilized for the recruitment of patients.

Inclusion criteria:

All expectant mothers were admitted to the KAHER Prabhakar Kore Hospital.

- With term gestation (37 weeks and 41 weeks 6 days)
- With singleton pregnancy
- With cephalic presentation

Exclusion criteria:

- Oligohydramnios
- Polyhydramnios
- Congenital abnormalities of the foetus
- Intra-uterine foetal death
- Premature with uterine fibroids or any other abdominal mass

Sample size:

A convenience sampling method was employed, and the minimum sample size was determined using the formula below, based on the prevalence rate:

$$n = \frac{Se\ (1-Se)\ Zn^2/2}{Prev + d^2}$$

Where n - sample size required

Se – predetermined values of sensitivity

d – maximum marginal error required

Z - value corresponding to the level of confidence required

Prev - prevalence

The sensitivity of USG fetal weight estimation is 69.4% with respect to the ABW assuming 50% = prevalence, at 95% confidence level and 10% maximum error, the sample size is given by,

$$n = \frac{0.694 \times (1-0.694) \times 1.96^2}{0.5 \times 0.1^2}$$

Consequently, it was determined that a minimum sample size of 163 was necessary as the precision of the outcome increased with larger sample sizes.

Procedure

All women who were pregnant and admitted to the KLE's Dr. Prabhakar Kore Hospital and Medical Research Centre in Belagavi between 37 and 41 weeks and 6 days POG were included in the study.

Clinical examination of foetal weight: Following bladder emptying, the patient was positioned dorsally. Dextro-rotation of the gravid uterus was simultaneously corrected. A non-stretchable, flexible measuring tape was utilized in measuring the SFH (symphysio-fundal height) by determining the distance from the upper edge of the symphysis pubis to the fundus.

Johnson's formula:

Weight in grams (SFH in cms – X) x 155

Where x = 12, if the presenting was not engaged

X = 11, if presenting part was engaged

Ultrasonographic estimation of foetal weight

Calculated using Hadlock's formula

Log EBW = 1.335-0.0034 (AC X FL) +0.0316 (BPD) + 0.0457 (AC) + 0.1623 (FL)

Statistical Analysis:

As this study was observational, the plan for the data analysis was as follows.

- SPSS version 21. (IBM SPASS statistics [IBM corporation: NY, USA]) was used for data collection.
- Descriptive statistics of the explanatory and outcome variables were calculated using means and standard deviations for quantitative variables and frequencies and proportions for qualitative variables.
- Inferential statistics such as the Chi-square test were applied for qualitative variables to find the association, and Pearson's correlation was applied to correlate Clinical Estimated Foetal Weight, Estimated foetal weight with Actual Birth Weight, Paired t-test was applied to compare the Clinical Estimated foetal Weight and Estimated foetal weight with Actual Birth Weight.
- The level of significance is set at 5%

RESULTS

DISTRIBUTION OF PARTICIPANTS BY AGE DISTRIBUTION

Among the 200 patients, 125 (62.5%) were over 25 years of age, while 75 (37.5%) were between 19 and 25 years of age. (Table 1 and Figure 1)

TABLE 1: PARTICIPANTS AGE DISTRIBUTION

Age Groups	Frequency	Percent
19 to 25 yrs	75	37.5
> 25 yrs	125	62.5
Total	200	100.0

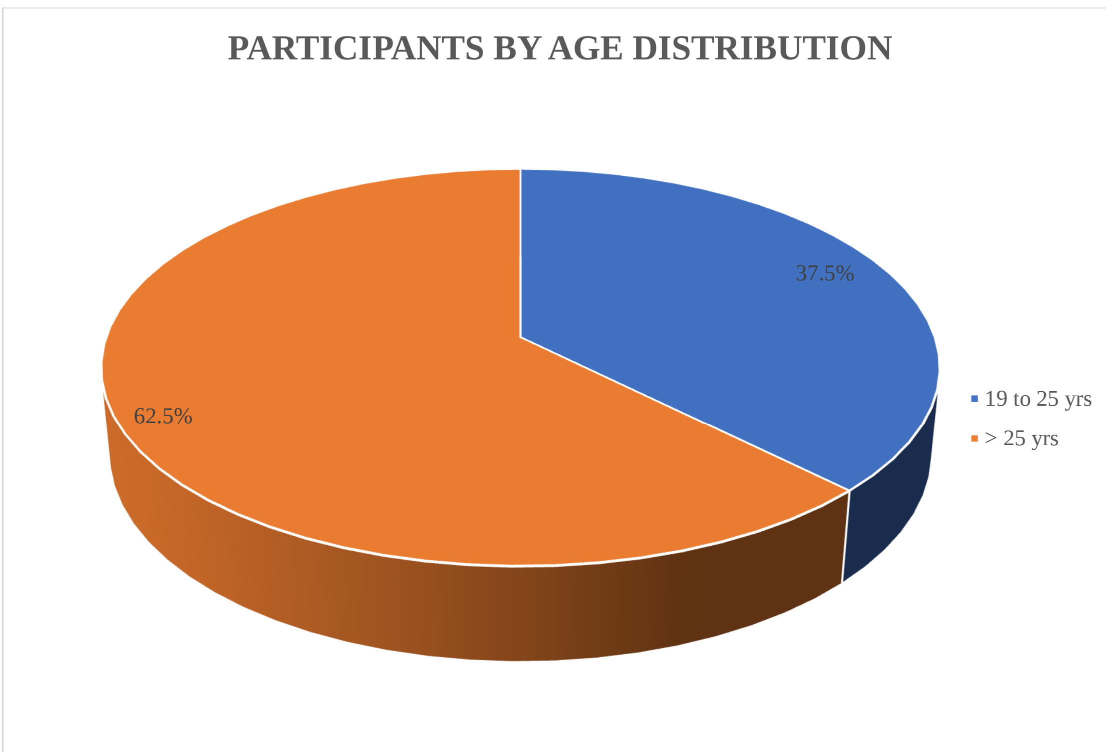

FIGURE 1: PARTICIPANTS BY AGE DISTRIBUTION

DISTRIBUTION OF THE PARTICIPANTS BY GRAVIDITY

Of the 200 (100%) patients, 84 out of 200 patients (42%) were primigravidae, while the remaining 116 (58%) were multigravida. (Table 2 and Figure 2)

TABLE 2: DISTRIBUTION OF THE PARTICIPANTS BY GRAVIDITY

Parity	Frequency	Percent
Primigravidae	84	42.0
Multigravida	116	58.0
Total	200	100.0

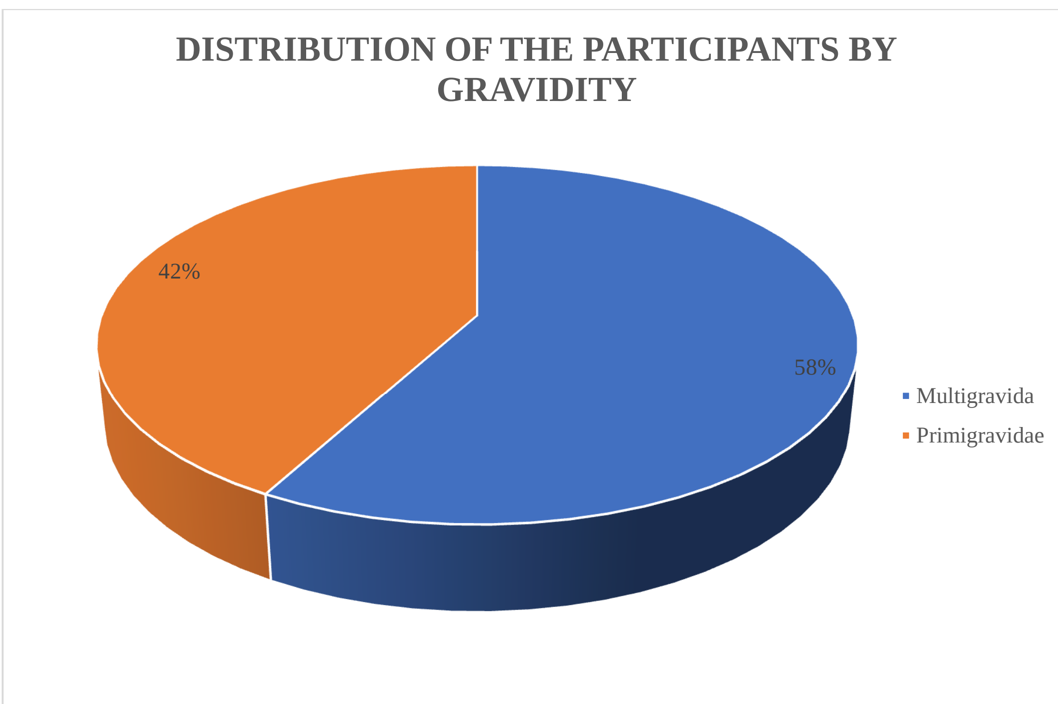

FIGURE 2: DISTRIBUTION OF THE PARTICIPANTS BY GRAVIDITY

DISTRIBUTION OF PARTICIPANTS BY GESTATIONAL AGE

Additionally, 152 (76%) patients had a gestational age between 40 and 41.6 weeks, while 48 (24%) patients had a gestational age between 37 and 39.6 weeks. (Table 3 and Figure 3)

TABLE 3: DISTRIBUTION OF PARTICIPANTS BY GESTATIONAL AGE

Gestational Age	Frequency	Percent
37 to 39.6 weeks	48	24.0
40 to 41.6 weeks	152	76.0
Total	200	100.0

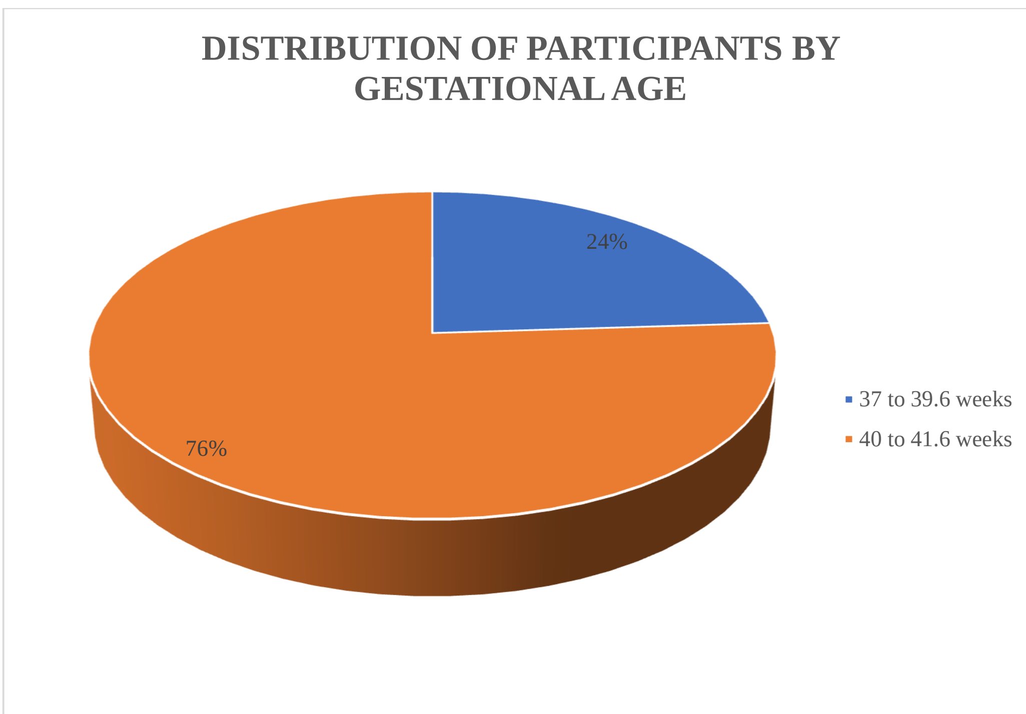

FIGURE 3: DISTRIBUTION OF PARTICIPANTS BY GESTATIONAL AGE

DISTRIBUTION OF PARTICIPANTS BY STATION OF HEAD

Of the 200 (100%) patients, 121 out of 200 patients (60.5%) showed a below-head relation to the spine, while the remaining 79 (39.5%) had an above-head relation to the spine. (Table 4 and Figure 4)

TABLE 4: DISTRIBUTION OF PARTICIPANTS BY STATION OF HEAD

Head relation to spine	Frequency	Percent
Above spine	79	39.5
Below spine	121	60.5
Total	200	100.0

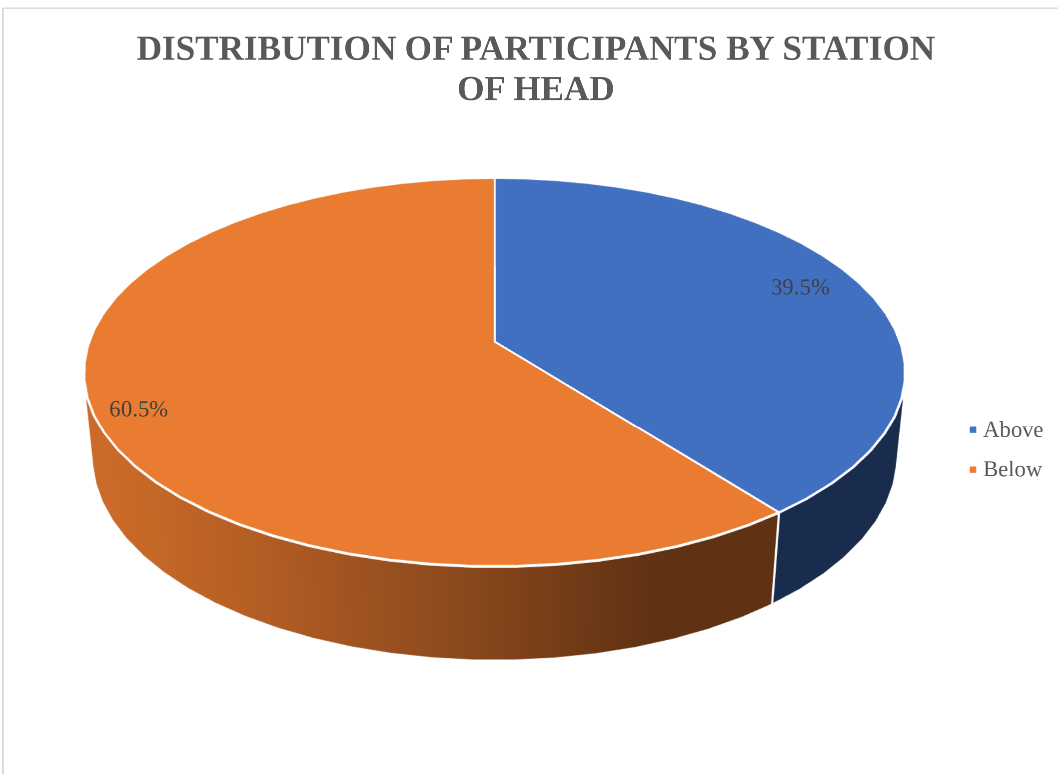

FIGURE 4: DISTRIBUTION OF PARTICIPANTS BY STATION OF HEAD

MEAN BIRTH WEIGHT

The mean of actual birth weight was found to be higher - 2969.9 ± 335.9 compared to the ultrasound estimated foetal weight of 2925.8 ± 311 and the clinically estimated foetal weight of 2908.2 ± 264. (Table 5)

TABLE 5: MEAN BIRTH WEIGHT

	N	Minimum	Maximum	Mean	Std. Deviation
Actual Birth Weight	200	2200.0	3700.0	2969.9	335.9
Clinical Estimated foetal weight	200	2400.0	3621.0	2908.2	264.0
Estimate foetal weight by USG	200	1900.0	3600.0	2925.8	311.0

COMPARISON OF THE ACTUAL BIRTH WEIGHT AND CLINICAL ESTIMATED FOETAL WEIGHT USING PAIRED T TEST

The mean birth weight was found to be higher at 2969.9 ± 335.88, compared to the estimated foetal weight of 2908.215 ± 263.99. A paired t-test revealed a statistically significant difference between the two groups (P =0.002). Table 6 shows the mean comparison of the actual birth weight and clinically estimated foetal weight.

TABLE 6: COMPARISON OF THE ACTUAL BIRTH WEIGHT AND CLINICAL ESTIMATED FOETAL WEIGHT USING PAIRED T TEST

	Mean	S.D	Mean diff	p value
Actual Birth Weight	2969.850	335.8892	61.63	0.002*
Clinical Estimated foetal weight	2908.215	263.9999		

*Significant

COMPARISON OF THE ACTUAL BIRTH WEIGHT AND ESTIMATED FETAL WEIGHT BY USG USING PAIRED T TEST

The mean actual birth weight was found to be higher - 2969.9 ± 335.88) than the estimated foetal weight (2925.8 ± 310.9). The paired t-test revealed a statistically significant difference between the two groups (P =0.05). Table 7 provides a comparison of the mean values of the actual birth weight and the estimated foetal weight.

TABLE 7: COMPARISON OF THE ACTUAL BIRTH WEIGHT AND ESTIMATED FETAL WEIGHT BY USG USING PAIRED T TEST

	Mean	S.D	Mean diff	p value
Actual Birth Weight	2969.850	335.8892	44.05	0.05*
Estimated foetal weight by USG	2925.800	310.9951		

*Significant

PEARSON'S CORREALTION BETWEEN ACTUAL BIRTH WEIGHT WITH CLINICAL ESTIMATED FOETAL WEIGHT AND ESTIMATED FETAL WEIGHT BY USG

Pearson's correlation test revealed a positive and moderate correlation between actual birth weight and clinically estimated foetal weight (r=0.59, P=0.001). Similarly, a significant correlation was observed between actual birth weight and estimated foetal weight (r=0.52, P=0.001). (Table 8, Figure 5 & Figure 6)

TABLE 8: PEARSON'S CORREALTION BETWEEN ACTUAL BIRTH WEIGHT WITH CLINICAL ESTIMATED FOETAL WEIGHT AND ESTIMATED FETAL WEIGHT BY USG

	r value	p value
Actual Birth Weight Vs Clinical Estimated foetal weight	0.59	0.001*
Actual Birth Weight Vs Estimated Foetal Weight by USG	0.52	0.001*

*Significant

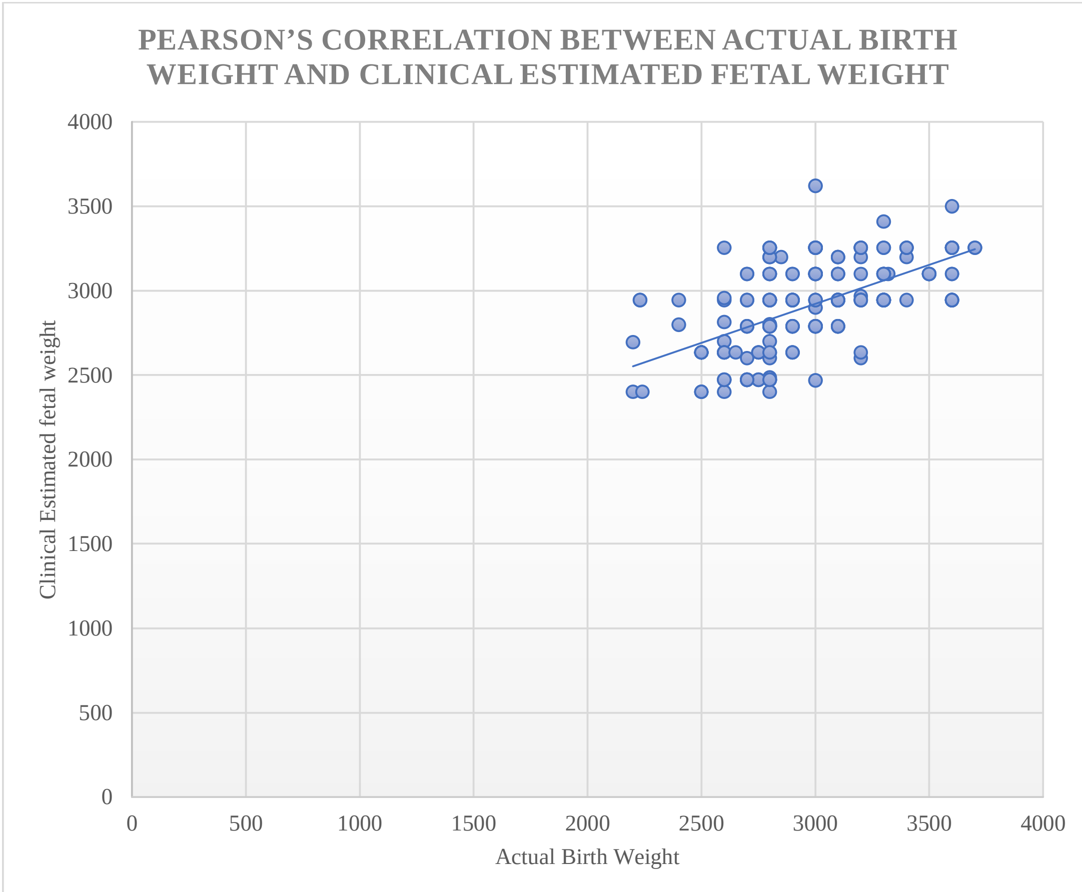

FIGURE 5: PEARSON'S CORRELATION BETWEEN ACTUAL BIRTH WEIGHT AND CLINICAL ESTIMATED FETAL WEIGHT

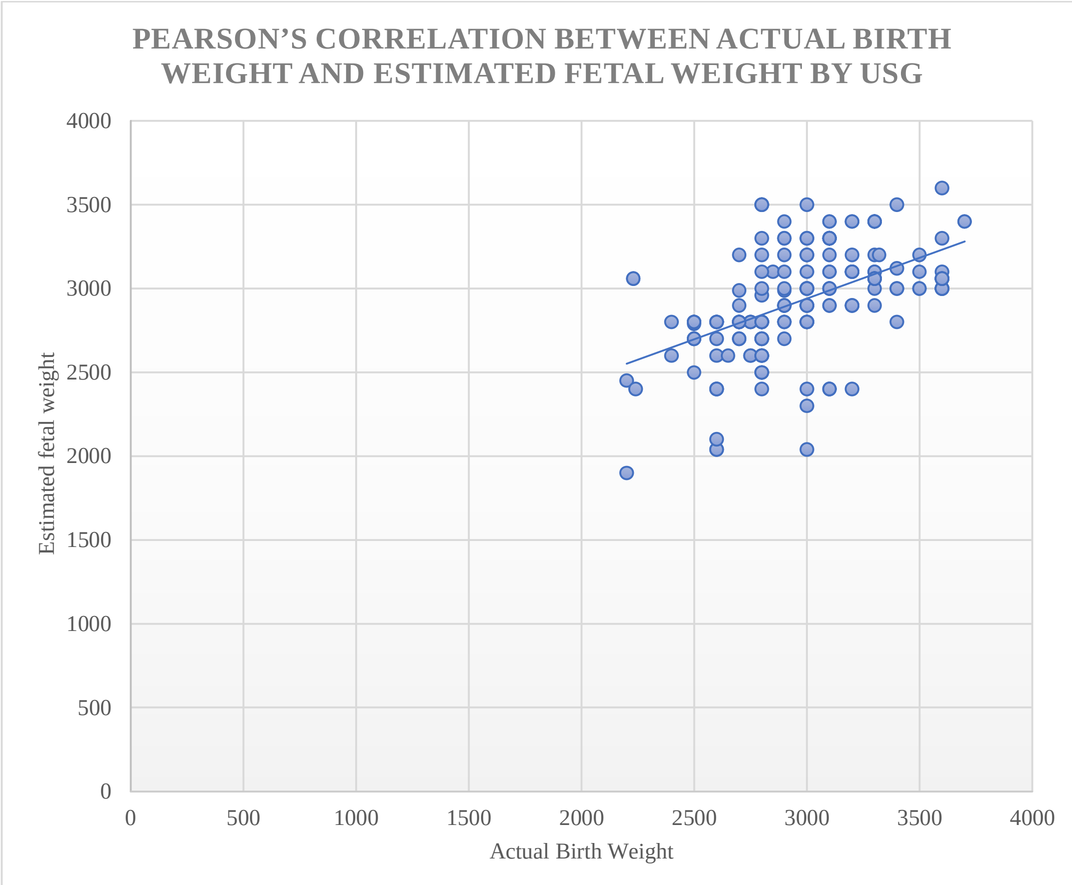

FIGURE 6: PEARSON'S CORRELATION BETWEEN ACTUAL BIRTH WEIGHT AND ESTIMATED FETAL WEIGHT BY USG

DISCUSSION

An accurate prediction of fetal weight is a crucial factor for devising effective delivery management strategies. The importance of accurately estimating foetal weight in the context of inducing labour and determining the mode of delivery has been a topic of conversation among obstetricians and shared with expectant mothers for quite some time.[94] In this study, the research findings reveal that the difference between the mean estimated foetal weight and the mean actual birth weight was at its lowest for the ultrasound estimated foetal weight, followed by the clinically estimated foetal weight.

The widely accepted method for determining foetal weight is through the use of ultrasound, as previously discussed in studies[95-97], and most commonly performed by taking three measurements and fitting them into an algorithm developed by Hadlock et al.[95] Alternative methods like MRI or soft-tissue assessments have been found to offer no additional advantage.[98,99] The international percentile curves for estimating the weight of unborn foetuses, based on studies in Anglo-Saxon countries, may not be the ideal approach as they adopt a one-size-fits-all strategy, which may not account for variations in foetuses that are either larger or smaller than average.[100,101] Nicolaides et al.[102] have very recently published a study with the aim of developing foetal and neonatal population weight charts. The reasoning behind is that the reference ranges for EFW are applicable to the entire population, whereas the conventional technique of creating birth-weight charts is deceptive due to the significant number of preterm births resulting from pathological pregnancies.[102] The research indicated that a uniform international standard for all nations is not advisable.[102] Various studies have shown that dissimilarities in percentile curves can result from disparities in the study populations, which could be attributed to differences in underlying factors.[103]

The present research indicated a notable disparity between Johnson's method and Hadlock's method with respect to actual birth weight. The research demonstrated that Insler's and Hadlock's formulas were not as accurate as ultrasonography when it came to predicting actual birth weight, with the latter proving to be a closer estimation.[94] In a different investigation, the calculation of foetal weight with the aid of ultrasonography was found to be more effective than Hadlock's technique.[95] Several studies indicate that Johnson's and Insler's formulas are not significantly different from the actual birth weight.[104] The likely explanation for the discrepancy between current research and numerous studies may be attributed to factors such as methodology, sample size, research environment, and sociocultural influences.

In our research, we observed that the actual birth weight was higher than the values predicted by using symphysio-fundal height and ultrasonography. Research has indicated that Insler's formula produced the smallest discrepancy with actual birth weight, whereas Johnson's formula yielded the greatest discrepancy.[105] The current research findings were not consistent with other studies due to various factors such as differences in sample size, percentage of error, inclusion and exclusion criteria, and statistical tests.

Studies conducted by other researchers have also indicated that Johnson's formulas and ultrasound are more precise in identifying macrosomia.[97,99,102] According to one study, as gestational age and foetal weight increase, the ultrasound error in estimating foetal weight decreases.[106] The reason for the discrepancy between the current study and previous ones might be attributable to the foetal weight estimate provided by the investigator in the present study, whereas in numerous other studies, different individuals were responsible for estimating foetal weight. However, in contrasting studies, pre-ultrasound examinations were conducted using a single device at a single centre.

The outcomes of the current investigation indicated that the ultrasound findings were very closely aligned with the actual birth weight, in contrast to the symphysio-fundus height. The use of ultrasonography for estimating fetal weight is just as precise as employing clinical methods, a conclusion that is supported by some previous research.[107,108]

According to a study, Johnson's formula is most accurate when the difference between two weights is less than 300 g.[109] In another research, it was established that Johnson's formula was unsuitable for determining the weight of foetuses in the Ethiopian population.[110] The probable causes for the divergent outcomes of studies may include factors such as racial disparities, research techniques, analytical approaches, and the dimensions of the sample groups.

In a study carried out in Brazil by Torloni et al., a comparison was made between the precision of Dare's formula, Johnson's formula, and the mother's evaluation of foetal weight and ultrasound in predicting birth weight. They examined the outcomes of 100 women who had full-term, head-down, single pregnancies and gave birth within three days of the foetal weight assessment. According to the research, the mother's estimate, Dare's formula, Johnson's formula, and ultrasound estimate correctly estimated birth weights to be within 10% of the actual weight in 59%, 57%, 61%, and 65% of participants, respectively. Researchers suggested that Dare's formula was less precise than Johnson's formula in forecasting birth weight due to the absence of an adjustment for obesity in Dare's formula. Based on the findings that 24% of participants were obese, it was suggested that a larger study be conducted to evaluate the validity of Dare's formula in obese women.[19] A study conducted by Deeluea et al. in Thailand found variations in the fundal height growth curves among pregnant women of different weights, including underweight, overweight, and obese individuals, as compared to those with normal weight. As per this research, it can be inferred that the body weight of a woman impacts both the SFH and EFW, given that the SFH is a component in calculating the EFW using Dare's formula.[111]

The study found two strong correlations, 059 and 0.52 (P=0.01), between ABW and and EFW, which were similar to the values discovered by Ariyo et al. and Mortazavi and Akaberi in Iran where the study participants demonstrated a correlation of 0.52 and 0.56 between their EFW and ABW.[112]

Unlike the conclusion of this research, Sharma et al. discovered that there was no notable dissimilarity between the average EFW calculated from the product of SFH and Abdominal Girth and the mean ABW among their study participants. The exclusion of obese women from their study may have led to better results. Their study did not limit patients to those with full-term pregnancies. Instead, they included women who reported being in labour at 28 weeks or more of gestation age.[114]

The accuracy of foetal weight prediction is reportedly inconsistent. Several research papers have documented improved outcomes in cases where patients were subjected to ultrasonography.[114-116] Nevertheless, other research has demonstrated no significant dissimilarity in the precision of estimating fetal weight using clinical estimation and that of estimating fetal weight using ultrasonography.[117-120] Moreover, the use of ultrasonography is associated with several limitations, including its costly nature, time-consuming process, and the need for specialized instruments and skills. On the other hand, magnetic resonance imaging (MRI) can be employed to enhance the precision of foetal weight estimation.[120,121] Although this method's results are more precise than those of ultrasonography or clinical estimation, it is constrained by its extremely high cost, scarcity of trained personnel, and limited availability of essential equipment.

The current study's results, along with those from other research, indicate that clinical methods are crucial for estimating fetal weight. Furthermore, it proposes a method for estimating fetal weight. Ultrasonography is the most frequently used method for determining foetal weight compared to clinical methods, however, the gold standard for accuracy has yet to be established as the actual birth weight. This research demonstrated that the symphysio-fundal height is as precise as ultrasonography in estimating foetal weight.

CONCLUSION

The ultrasound method is better at determining actual birth weight than the clinical method. However, clinical estimation of foetal weight (by Johnson's formula) is easily accessible and affordable, and can be used in developing countries with poor resources.

SUMMARY

This cross-sectional observational study was conducted in the Department of Obstetrics and Gynaecology at KLE's Dr. Prabharkar Kore Hospital and Medical Research Centre in Belagavi. between January 2023 December 2023. The study included 200 expecting women aged between 37 and 41 weeks and 6 days POD (period of gestation) to compare the actual birth weight with the expected foetal weight in term pregnancy measured using symphysio-fundal height and ultrasonography. The study findings are as follows;-

- The mean patient age was 25.85 years with a standard deviation of 2.29 years. The youngest patient was 19 years old and the oldest was 34 years old. Of the 200 patients, 125 (62.5%) were over 25 years of age, while 75 (37.5%) were between 19 and 25 years of age.
- Of the 200 patients studied, 84 (42%) were experiencing their first pregnancy (primigravidae), while the remaining 116 (58%) had experienced at least one previous pregnancy (multigravida)..
- Of the 200 patients studied, 121 (60.5%) showed a head position below the spinal alignment, while the remaining 79 (39.5%) displayed a head position above the spinal alignment.
- The study found that the average actual birth weight was higher at 2969.9 ± 335.9 grams, compared to the average estimated foetal weight of 2925.8 ± 311 g from ultrasound and the average clinically estimated foetal weight of 2908.2 ± 264 g determined by medical professionals.
- The mean actual birth weight was found to be higher at 2969.9 ± 335.88 compared to the clinically estimated foetal weight of 2908.215 ± 263.99 (P=0.002).

- The mean actual birth weight was found to be higher - 2969.9 ± 335.88, in comparison to the ultrasound estimated foetal weight of 2925.8 ± 310.9 (P=0.05).
- Pearson's correlation test revealed a positive and moderate correlation between actual birth weight and clinically estimated foetal weight (r=0.59, P=0.001). Similarly, a significant correlation was observed between actual birth weight and ultrasound estimated foetal weight (r=0.52, P=0.001).

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ANNEXURE – I – PROFORMA

SCREENING FORM

NAME

AGE

IP NO

PARITY

EXCLUSION CRITERIA

1. OLIGOHYDRAMINOS
2. POLYHYDRAMINOS
3. CONGENITAL ABNORMALITIES OF FETUS
4. INTRAUTERINE FETAL DEATH
5. PROM
6. PREGNANCY WITH UTERINE FIBROIDS
7. FGR
8. POST DATISM

INCLUSION CRITERIA

1. TERM GESTATION
2. WITH SINGLETON PREGNANCY
3. WITH CEHPHALIC PRESENTATION

PATIENT RECRUITED IN THE STUDY

PROFORMA

TITLE : "Estimation of expected fetal weight using symphysio-fundal height and USG and comparison it with actual birth weight"

SCREENING NO :

ENROLMENT NO :

IP NO :

NAME :

AGE :

ADDRESS :

CONTACT NO :

PARITY :

DIAGNOSIS :

MENSTRUAL CYCLE - ________ REGULAR ________ IRREGULAR

IF IRREGULAR CYCLE. ____________________

LMP :

EDD :

CEDD :

GESTATIONAL AGE : ____________

ACCURACY OF DATING: ☐POOR ☐GOOD

PER ABDOMEN EXAMINATION :

UTERINE SIZE

CEPHALIC PRESENTATION ☐YES ☐ NO

SYMPHYSIO-FUNDAL HEIGHT:________CM

LIQUOR : CLINICALLY ADEQUATE☐ LESS ☐ EXCESS☐

HEAD RELATION TO THE SPINES Above ☐ Belove ☐

CLINICAL EXTIMATED FETAL WEIGHT :

Johnson formula : EFW(G): (SFH-X)X155= _____(g)

X= 11 if presenting part is engaged.

x=12 if presenting part is not engaged.

USG DATE :

BPD ____________

HC ____________

AC ____________

FL - ____________

EFW - ____________

AFI - ____________

ACTUAL BABY BIRTH WEIGHT :

MODE OF DELIVERY :

☐VAGINAL ☐VENTOUSE :

☐FORCEPS ☐LSCS (EMERGENCY / LSCS)

INDICATION FOR LSCS: ____________________

S.no	IP NO.	Age in years	Parity		Presentation	Mode of delivery	Indication for LSCS	Baby gender	Birth Weight	LMP	EDD	CEDD	Gestational age	Accuracy of dating	Uterine size	Symphysio-fundal height	Liquor	Clinical Estimated fetal weight	BPD	HC	AC	FL	EFW	AFI	Actual birth weight	head relation to spines
1	1136477	21yrs	primigravidae		cephalic	ft elective lscs	previous pregnancy	male	3.6kg	30-11-2022	06-09-2023	no	38+4	good	term	30cm	adequate	2945gms	67%	81%	37%	95%	3.06kg	7.7cm	3.61kg	below
2	1136778	24yrs	primigravidae		cephalic	ft emergengy lscs	fetal distress	male	2.23kg	02-12-2022	08-09-2023	no	38+4	good	term	30cm	adequate	2945gms	67%	81%	37%	95%	3.06kg	7.7cm	2.23kg	below
3	1136545	20yrs	G2P1		cephalic	ft emergengy lscs	previous lscs in labour	male	3.3kg	04-12-2021	10-04-2023	no	38	good	term	30cm	adequate	2945gms	67%	81%	37%	95%	3.06kg	7.7cm	3.3kg	below
4	10008123	20yrs	G2P1		cephalic	ft ventouse delivery		male	2.7kg	21-12-2022	07-09-2023	no	37+4	good	term	31cm	adequate	2945gms	87%	92%	72%	47%	2.99kg	12.8cm	2.7kg	above
5	10009518	27yrs	primigravidae		cephalic	ftnd		male	3.1kg	18-12-2022	24-09-2023	no	40	good	term	30cm	adequate	2945gms	8%	4%	5%	5%	2.4kg	9.2cm	3.1kg	below
6	10003205	27yrs	primigravidae		cephalic	ft ventouse delivery		female	3.1kg	19-11-2022	26-08-2023	no	40	good	term	30cm	adequate	2945gms	8%	4%	5%	5%	2.4kg	9.2cm	3.1kg	below
7	10000243	26yrs	primigravidae		cephalic	ft elective lscs		male	2.6kg	20-11-2022	27-08-2023	no	38+1	good	term	28cm	adequate	2635gms	36%	5%	86%	4%	2.04kg	11.5cm	2.6kg	above
8	10009452	20yrs	G3A2		cephalic	ft emergengy lscs	CPD	female	2.7KG	26-11-2022	02-10-2023	no	39+1	good	term	28cm	adequate	2472gms	25%	92%	15%	75%	2.8kg	8cm	2.7kg	below
9	10000735	30yrs	primigravidae		cephalic	ft emergengy lscs	npl	female	2.7kg	10-04-2022	17-08-2023	no	39+6	good	term	28cm	adequate	2472gms	25%	92%	15%	75%	2.8kg	8cm	2.7kg	below
10	100004431	20yrs	P2L2A2		cephalic	ft emergengy lscs	previous lscs in labour	female	3.7KG	08-12-2022	14-09-2023	no	38+1	good	term	32cm	adequate	3255gms	80%	47%	95%	82%	3.4kg	13.2cm	3.7kg	below
11	10001027	25yrs	p2l2		cephalic	ft elective lscs	previous lscs in labour	male	3.6kg	06-01-2023	30-08-2023	no	38+1	good	term	32cm	adequate	3255gms	80%	47%	95%	82%	3kg	13.2cm	3.6kg	below
12	1000001	21yrs	p3l3		cephalic	ft ventouse delivery		male	2.8kg	12-11-2022	18-08-2023	no	39	good	term	28cm	adequate	2487gms	25%	92%	15%	75%	2.8kg	8cm	2.8kg	below
13	6480419	23yrs	g2a1		cephalic	ft emergengy lscs	npl	male	3.2kg	05-11-2022	12-08-2023	no	40+2	good	term	30cm	adequate	2967gms	5%	6%	22%	19%	3.1kg	15cm	3.2kg	below
14	10005103	20yrs	g2a1		cephalic	ftnd		female	3.3kg	07-12-2022	14-09-2023	no	38+6	good	term	30cm	adequate	2945gms	67%	81%	37%	95%	3.06kg	7.7cm	3.3kg	below
15	100051445	21yrs	g3p1l1a1		cephalic	ft emergengy lscs	previous lscs in labour	female	2.5kg	18-12-2022	24-09-2023	no	37+6	good	term	28cm	adequate	2400gms	53%	61%	61%	84%	2.7kg	12.3cm	2.5kg	above
16	10008227	19yrs	g3a2		cephalic	ft elective lscs	one loop of cord	male	2.9kg	29-11-2022	06-10-2023	no	37+5	good	term	31cm	adequate	2945gms	87%	92%	72%	47%	2.99kg	12.8cm	2.9kg	above
17	10008604	30yrs	primigravidae		cephalic	ftnd		male	3.1kg	07-12-2022	21-09-2023	no	40	good	term	29cm	adequate	2790gms	50%	81%	43%	8%	2.9kg	14cm	3.1kg	below
18	10008219	27yrs	g3p2l2		cephalic	ft elective lscs	previous 2 lscs	male	3.1kg	28-12-2022	05-10-2023	no	38	good	term	31cm	adequate	2945gms	50%	81%	43%	8%	2.9kg	14cm	3.1kg	below
19	10003449	25yrs	g2a1		cephalic	ft elective lscs	previous lscs in labour	female	2.6kg	06-12-2022	12-09-2023	no	38	good	term	28cm	adequate	2635gms	36%	5%	86%	4%	2.04kg	11.5cm	3kg	above
20	10009204	21yrs	primigravidae		cephalic	ftnd		female	3.3kg	01-10-2022	01-10-2023	no	38+6	good	term	33cm	adequate	3410gms	80%	42%	62%	75%	3.2kg	12cm	3.3kg	below
21	10003253	21yrs	g2p1l1		cephalic	ft emergengy lscs	previous 2 lscs	male	3.2kg	29-11-2022	06-09-2023	no	38+6	good	term	31cm	adequate	3100gms	62%	69%	68%	58%	3.2kg	19.6cm	3.2kg	below
22	10004269	25yrs	primigravidae		cephalic	ftvd		female	3.32kg	30-11-2022	06-09-2023	no	39+1	good	term	31cm	adequate	3100gms	62%	69%	68%	58%	3.2kg	19.6cm	3.32kg	below
23	10009206	24yrs	g2p1l1		cephalic	ft emergengy lscs	previous lscs in labour	male	2.6kg	28-12-2022	04-10-2023	no	38+3	good	term	30cm	adequate	2945gms	15%	53%	37%	38%	2.6kg	7cm	2.6kg	below
24	10009190	24yrs	ftnd		cephalic	ftnd		male	2.8kg	28-12-2022	04-10-2023	no	39	good	term	30cm	adequate	2945gms	15%	53%	37%	38%	2.6kg	7cm	2.8kg	below
25	1206651	25yrs	g2p1l1		cephalic	ft emergengy lscs	previous lscs in labour	female	3.1kg	06-11-2022	13-08-2023	no	38+2	good	term	32cm	adequate	3100gms	11%	5%	66%	5%	3.3kg	12cm	3.1kg	above
26	1106789	25yrs	g2a1		cephalic	ft emergengy lscs	msl	male	3.3kg	18-12-2022	24-09-2023	no	39+6	good	term	30cm	adequate	2945gms	25%	56%	60%	73%	3.1kg	12cm	3.3kg	below
27	10009213	25yrs	g2a1		cephalic	ftnd		male	3.3kg	02-01-2023	09-10-2023	no	37	good	term	30cm	adequate	2945gms	25%	56%	60%	73%	3.1kg	12cm	3.3kg	below
28	10001536	26yrs	p1l1		cephalic	ftnd		female	2.6kg	12-04-2022	19-08-2023	no	40	good	term	30cm	adequate	2956gms	15%	6%	48%	95%	2.4kg	11.7cm	2.4kg	below
29	7040008	26yrs	primigravidae		cephalic	ft emergengy lscs	cdmr	male	2.9kg	25-12-2022	01-01-2023	no	38+4	good	term	30cm	adequate	2790gms	50%	84%	84%	67%	3.3kg	9cm	2.9kg	above
30	10000787	24yrs	g2p1l1		cephalic	ft emergengy lscs	previous lscs in labour	male	3kg	20-11-2022	27-08-2023	no	38+4	good	term	30cm	adequate	2790gms	39%	10%	39%	33%	2.3kg	12cm	3kg	above
31	7055153	25yrs	primigravidae		cephalic	ft emergengy lscs	cpd	male	3kg	03-11-2022	10-08-2023	no	40	good	term	27cm	adequate	2468gms	35%	5%	13%	5%	3.1kg	7.9cm	3kg	below
32	1209473	26yrs	g2p1l1		cephalic	ft ventouse delivery		male	2.4kg	14-11-2022	21-08-2023	no	38+5	good	term	29cm	adequate	2798gms	25%	47%	53%	38%	2.8kg	12.2cm	2.4kg	below
33	1209299	26yrs	g2p1l1		cephalic	ftnd		male	2.8kg	30-10-2022	05-08-2023	no	40	good	term	29cm	adequate	2798gms	12%	19%	42%	5%	2.8kg	11.89cm	2.8kg	below
34	1209103	26yrs	primigravidae		cephalic	ftvd		female	2.8kg	02-11-2022	09-08-2023	no	40	good	term	29cm	adequate	2800gms	12%	19%	42%	5%	2.8kg	8cm	2.8kg	below
35	10001272	27yrs	g3p1l1a1		cephalic	ft emergengy lscs	previous lscs in labour	male	2.9kg	05-11-2022	12-08-2023	no	37+6	good	trem	32cm	adequate	3100gms	90%	33%	92%	58%	3.2kg	11.3cm	2.9kg	above
36	10009261	25yrs	primigravidae		cephalic	ft emergengy lscs	fetal tachycardia	female	2.7kg	16-12-2022	22-09-2023	no	39+6	good	term	30cm	adequate	2790gms	9%	53%	39%	40%	2.7kg	7cm	2.7kg	above
37	10009121	26yrs	g3a2		cephalic	ft emergengy lscs	msl	female	2.7kg	01-01-2022	08-10-2023	no	38	good	term	29cm	adequate	2790gms	9%	53%	39%	40%	2.7kg	7cm	2.7kg	above
38	10007255	27yrs	g2p1l1a1		cephalic	ft elective lscs	previous lscs in labour	female	3.1kg	21-12-2022	19-09-2023	no	39+2	good	term	32cm	adequate	3100gms	11%	5%	66%	5%	3.3kg	12cm	3.1kg	above
39	10001822	27yrs	primigravidae		cephalic	ft emergengy lscs	cpd	male	3.6kg	14-11-2022	21-08-2023	no	40	good	term	33cm	adequate	3500gms	44%	59%	44%	43%	3.6kg	12cm	3.6kg	below
40	10000037	25yrs	g2a1		cephalic	ftnd		male	2.7kg	09-11-2022	16-08-2023	no	39+4	good	term	29cm	adequate	2600gms	15%	28%	47%	62%	2.9kg	14cm	2.7kg	above
41	10000370	26yrs	p3l3		cephalic	ft emergengy lscs	previous lscs in labour	female	3kg	11-11-2022	15-08-2023	no	39+3	good	term	30cm	adequate	2900gms	5%	5%	8%	46%	2.9kg	14cm	3kg	below
42	1209317	25yrs	primigravidae		cephalic	ftnd		female	2.6kg	10-11-2022	17-08-2023	no	38+2	good	term	29cm	adequate	2700gms	5%	5%	17%	27%	2.7kg	8cm	2.6kg	below
43	10007502	25yrs	g2a1		cephalic	ft emergengy lscs	fetal distress	female	3kg	09-12-2022	15-09-2023	no	40	good	term	32cm	adequate	3100gms	58%	75%	38%	62%	3kg	12.09cm	3kg	above
44	10007965	26yrs	g3a2		cephalic	ft elective lscs	cdmr	male	2.9kg	15-12-2022	22-09-2023	no	39+2	good	term	31cm	adequate	2945gms	87%	92%	72%	47%	2.9kg	12.9cm	2.9kg	above
45	1207830	26yrs	g3p1l1a1		cephalic	ftnd		male	3.6kg	08-11-2022	15-08-2023	no	38+4	good	term	32cm	adequate	3100gms	11%	5%	66%	5%	3.3kg	12cm	3.1kg	above
46	1206811	29yrs	g2a1		cephalic	ft elective lscs	cdmr	female	2.5kg	28-10-2022	04-08-2023	no	37	good	term	28cm	adequate	2400gms	53%	61%	60%	84%	2.7kg	12.3cm	2.5kg	above
47	1207421	31yrs	g4p1l1a2		cephalic	ftnd		female	3.1kg	06-11-2022	13-08-2023	no	38+4	good	term	32cm	adequate	3100gms	11%	5%	66%	5%	3.3kg	12cm	3.3kg	above
48	10007905	21yrs	primigravidae		cephalic	ftnd		female	3.2kg	11-12-2022	17-09-2023	no	40	good	term	31cm	adequate	2945gms	82%	81%	62%	77%	3.4kg	9.5cm	3.2kg	below
49	10007981	20yrs	primigravidae		cephalic	ftvd		female	2.8kg	11-12-2022	17-09-2023	no	37+5	good	term	29cm	adequate	2635gms	80%	17%	5%	31%	2.5kg	9.8cm	2.5kg	above
50	10007287	24yrs	primigravidae		cephalic	ft emergengy lscs	fetal distress	female	2.5kg	10-12-2022	16-09-2023	no	39+6	good	term	28cm	adequate	2635gms	80%	17%	5%	31%	2.5kg	11cm	2.5kg	above
51	10007975	20yrs	primigravidae		cephalic	ft emergengy lscs	cpd	male	2.8kg	18-12-2022	24-09-2023	no	39	good	term	29cm	adequate	2790gms	11%	5%	66%	5%	3.3kg	11.3cm	2.8kg	below
52	10007255	25yrs	p2l2a1		cephalic	ft elective lscs	previous lscs in labour	male	3.1kg	21-12-2022	19-09-2023	no	39	good	term	31cm	adequate	2945gms	11%	5%	66%	5%	3.3kg	12cm	3.1kg	above
53	10007991	25yrs	g2a1		cephalic	ft ventouse delivery		female	2.8kg	11-12-2022	18-09-2023	no	40	good	term	30cm	adequate	2790gms	49%	65%	70%	85%	2.96kg	17.4cm	2.8kg	above
54	10007502	26yrs	g2a1		cephalic	ft emergengy lscs	thick msl	male	3kg	09-12-2022	15-09-2023	no	40	good	term	32cm	adequate	3100gms	58%	75%	38%	62%	3kg	12.09cnm	3kg	above
55	10004175	27yrs	primigravidae		cephalic	ft emergengy lscs	thick msl	male	3.4kg	29-11-2022	05-09-2023	no	39+2	good	term	33cm	adequate	3200gms	64%	6%	18%	33%	3.12kg	13.89cm	3.4kg	above
56	10004462	27yrs	primigravidae		cephalic	ft emergengy lscs	cpd	female	3kg	21-11-2022	28-08-2023	no	39+2	good	term	31cm	adequate	3100gms	33%	50%	72%	50%	3kg	14cm	3kg	below
57	10001544	27yrs	g3p2l2		cephalic	ft emergengy lscs	fetal distress	female	3.1kg	21-11-2022	28-08-2023	no	38+6	good	term	33cm	adequate	3200gms	33%	50%	72%	50%	3kg	8cm	3.1kg	above

S.no	IP NO.	Age in years	Parity		Presentation	Mode of delivery	Indication for LSCS	Baby gender	Birth Weight	LMP	EDD	CEDD	Gestational age	Accuracy of dating	Uterine size	Symphysio-fundal height	Liquor	Clinical Estimated fetal weight	BPD	HC	AC	FL	EFW	AFI	Actual birth weight	head relation to spines
58	10001579	25yrs	g2p1l1		cephalic	ftnd		female	2.8kg	19-11-2022	26-08-2023	no	39+1	good	term	29cm	adequate	2790gms	33%	36%	75%	25%	2.5kg	10.4cm	2.8kg	below
59	10000392	25yrs	primigravidae		cephalic	ft emergengy lscs	cdmr	female	2.8kg	27-11-2022	03-09-2023	no	39	good	term	29cm	adequate	2700gms	33%	36%	75%	25%	2.5kg	10.4cm	2.5kg	below
60	10001586	26yrs	g3p1l1a1		cephalic	ftvd		female	2.8kg	02-12-2022	08-09-2023	no	37+3	good	term	28cm	adequate	2600gms	20%	44%	18%	18%	2.4kg	10.2cm	2.4kg	below
61	10009339	28yrs	primigravidae		cephalic	ftnd		female	2.7kg	19-12-2022	25-09-2023	no	40	good	term	30cm	adequate	2945gms	50%	62%	20%	18%	2.7kg	11.7cm	2.7kg	below
62	10000494	26yrs	primigravidae		cephalic	ftnd		female	2.2kg	17-11-2022	24-08-2023	no	38+5	good	term	29cm	adequate	2695gms	20%	46%	48%	50%	1.9kg	11.1cm	2.2kg	above
63	10000313	20yrs	g1a1		cephalic	ft emergengy lscs	npl	male	3.2kg	05-11-2022	12-08-2023	no	40+1	good	term	29cm	adequate	2600gms	15%	4%	32%	10%	2.4kg	12.15cm	3.2kg	above
64	10009453	26yrs	primigravidae		cephalic	ftnd		male	2.6kg	08-11-2022	15-08-2023	no	39+4	good	trem	27cm	adequate	2400gms	9%	19%	54%	58%	2.1kg	12cm	2.6kg	below
65	10009897	25yrs	g2p1l1		cephalic	ft elective lscs	previous lscs not willing for vbac	female	3kg	24-12-2022	30-09-2023	no	39+3	good	term	31cm	adequate	3100gms	5%	9%	5%	34%	2.8kg	12.6cm	3kg	below
66	10010004	27yrs	g2a1		cephalic	ft elective lscs	cpd	male	3.3kg	05-01-2023	12-10-2023	no	37+6	good	term	31cm	adequate	2945gms	35%	40%	27%	35%	2.9kg	7.7cm	3.3kg	above
67	10006071	21yrs	g2p1l1		cephalic	ftvd		female	2.8kg	25-01-2023	07-10-2023	no	38+4	good	term	31cm	adequate	3100gms	2%	47%	50%	50%	2.7kg	10.8cm	2.8kg	below
68	10009350	25yrs	primigravidae		cephalic	ft emergengy lscs	failed induction	male	3.2kg	19-12-2022	25-09-2023	no	40+2	good	term	29cm	adequate	2635gms	98%	75%	13%	50%	2.9kg	8.3cm	3.2kg	above
69	10009480	32yrs	primigravidae		cephalic	ft emergengy lscs	failed induction	male	3.1kg	30-12-2022	06-10-2023	no	38+4	good	term	31cm	adequate	2945gms	98%	91%	93%	82%	3.4kg	10.2cm	3.1kg	above
70	10009445	28yrs	g4p3l2d1		cephalic	ft elective lscs	previous 3 lscs	male	2.4kg	24-01-2023	18-10-2023	no	37	good	term	31cm	adequate	2945gms	7%	62%	18%	35%	2.6kg	10.7cm	2.4kg	above
71	100110286	25yrs	g2p1l1		cephalic	ft emergengy lscs	npl	male	2.9kg	28-11-2022	04-10-2023	no	39+1	good	term	29cm	adequate	2635gms	7%	62%	18%	35%	2.7kg	9.75cm	2.9kg	above
72	1199691	26yrs	g2p1l1		cephalic	ft emergengy lscs	previous lscs in labour	male	2.8kg	21-09-2022	05-07-2023	no	39+2	good	term	28cm	adequate	2472gms	25%	92%	15%	75%	2.8kg	8cm	2.8Kg	below
73	1199503	25yrs	primigravidae		cephalic	ft emergengy lscs	msl	male	2.8kg	23-09-2022	30-06-2023	no	40	good	term	28cm	adequate	2472gms	25%	92%	15%	75%	2.8kg	8cm	2.8kg	below
74	1200179	26yrs	primigravidae		cephalic	ft emergengy lscs	precious pregnancy	female	2.6kg	03-10-2022	10-07-2023	no	39+1	good	term	28cm	adequate	2472gms	25%	92%	15%	75%	2.8kg	8cm	2.7kg	below
75	1200565	27yrs	g3p1l1a1		cephalic	ft emergengy lscs	2nd stage arrest	female	2.75kg	01-10-2022	08-07-2023	no	39+4	good	term	28cm	adequate	2472gms	25%	92%	15%	75%	2.8kg	8cm	2.7kg	below
76	1200385	25yrs	primigravidae		cephalic	ft emergengy lscs	failed induction	female	3.6kg	05-10-2022	12-07-2023	no	38+6	good	term	30cm	adequate	2945gms	67%	81%	37%	95%	3.06kg	7.7cm	3.6kg	below
77	1200853	25yrs	primigravidae		cephalic	ft emergengy lscs	fetal tachycardia	female	3kg	30-09-2022	07-07-2023	no	39+6	good	term	32cm	adequate	3255gms	80%	47%	95%	82%	3kg	7.7cm	3kg	below
78	1201097	26yrs	g2a1		cephalic	ft emergengy lscs	thick msl	female	3.2kg	06-07-2022	07-03-2023	no	40wks	good	term	30cm	adequate	2945gms	5%	6%	22%	19%	3.1kg	12cm	3.2kg	below
79	1201485	32yrs	primigravidae		cephalic	ft ventouse delivery		male	3.1kg	07-10-2022	08-07-2023	no	40	good	term	30cm	adequate	2945gms	5%	6%	22%	19%	3.1kg	12cm	3.1kg	below
80	10009866	25yrs	primigravidae		cephalic	ftnd		male	3kg	14-12-2022	30-09-2023	no	39+4	good	term	32cm	adequate	3100gms	33%	56%	30%	75%	2.9kg	10.4cm	3kg	above
81	10009982	25yrs	g3p1l1a1		cephalic	ft elective lscs	previous lscs in labour	male	2.5kg	06-01-2022	13-10-2023	no	37+6	good	term	28cm	adequate	2400gms	53%	61%	60%	84%	2.7kg	12.3cm	2.5kg	above
82	10010194	26yrs	primigravidae		cephalic	ftnd		female	2.9kg	20-12-2022	26//9/23	no	40+2	good	term	30cm	adequate	2945gms	21%	5%	5%	43%	2.8kg	12.8cm	2.9kg	below
83	10010374	25yrs	g3p2l2		cephalic	ft elective lscs	previous 2 lscs	female	3.6kg	27-12-2022	03-10-2023	no	39+1	good	term	32cm	adequate	3100gms	85%	53%	57%	33%	3.1kg	12.07cm	3.6kg	above
84	10010334	25yrs	primigravidae		cephalic	ft emergengy lscs	precious pregnancy	male	3.1kg	13-12-2022	02-10-2023	no	39+3	good	term	31cm	adequate	2945gms	62%	58%	70%	82%	3.3kg	12.02cm	3.3kg	above
85	10010534	26yrs	g2p1		cephalic	ft elective lscs	cdmr	female	2.6kg	30-12-2022	19-10-2023	no	37+1	good	term	29cm	adequate	2635gms	67%	77%	62%	77%	2.8kg	15.2cm	2.6kg	above
86	10010527	25yrs	g2a1		cephalic	ft elective lscs	cdmr	female	2.75kg	30-12-2022	19-10-2023	no	37+1	good	term	29cm	adequate	2635gms	67%	77%	62%	77%	2.8kg	15.2cm	2.7kg	above
87	1200412	26yrs	primigravidae		cephalic	ft elective lscs	cdmr	female	2.6kg	14-10-2022	21-07-2023	no	37+5	good	term	29cm	adequate	2635gms	67%	77%	62%	77%	2.8kg	15.2cm	2.6kg	above
88	1200627	27yrs	g2p1l1		cephalic	ft elective lscs	previous 2 lscs	male	2.6kg	19-10-2022	26-07-2023	no	37	good	term	29cm	adequate	2635gms	67%	77%	62%	42%	2.8kg	10cm	2.6kg	above
89	10010285	29yrs	g2a1		cephalic	ft elective lscs	cdmr	male	3kg	05-01-2022	12-10-2023	no	38	good	term	32cm	adequate	3255gms	80%	47%	95%	82%	3kg	13.2cm	3kg	below
90	10010938	25yrs	g2p1l1		cephalic	ftnd		female	3.3kg	27-12-2022	17-10-2023	no	37+6	good	term	30cm	adequate	2945gms	80%	47%	95%	82%	3kg	11.7cm	3.3kg	below
91	10011050	26yrs	g3p1l1a1		cephalic	ft emergengy lscs	previous lscs in labour	male	3.1kg	03-01-2022	10-10-2023	no	39	good	term	30cm	adequate	2790gms	62%	58%	70%	82%	3.3kg	12.02cm	3.1kg	above
92	10010922	26yrs	primigravidae		cephalic	ftnd		male	2.65kg	06-01-2022	13-10-2023	no	38+3	good	term	28cm	adequate	2635gms	20%	2%	52%	18%	2.6kg	8.9cm	2.65kg	below
93	10010784	32yrs	g2a1		cephalic	ft emergengy lscs	non reassuring nst	male	2.7kg	21-12-2022	27-09-2023	no	40	good	term	29cm	adequate	2790gms	2%	21%	20%	92%	2.8kg	11.9cm	2.7kg	below
94	1201369	26yrs	primigravidae		cephalic	ftnd		male	3.6kg	18-07-2022	19-07-2023	no	38+4	good	term	32cm	adequate	3255gms	80%	47%	95%	82%	3kg	13.2cm	3.6kg	below
95	10009550	25yrs	primigravidae		cephalic	ft emergengy lscs	failed induction	male	3.2kg	19-12-2022	25-09-2023	no	40	good	term	30cm	adequate	2945gms	98%	75%	13%	5%	2.9kg	8.3cm	2.9kg	below
96	10012301	25yrs	g2p1l1		cephalic	ft emergengy lscs	previous lscs in labour	female	3kg	10-01-2022	17-10-2023	no	38+4	good	term	30cm	adequate	2790gms	98%	75%	13%	55	3.3kg	8.3cm	3.3kg	above
97	10012467	25yrs	primigravidae		cephalic	ftvd		female	3.6kg	10-01-2022	17-10-2023	no	38+6	good	term	32cm	adequate	3255gms	80%	47%	95%	82%	3kg	13.2cm	3.6kg	below
98	10013860	25yrs	g2a1		cephalic	ftnd		male	2.5kg	10-01-2022	17-10-2023	no	39+4	good	term	29cm	adequate	2635gms	10%	25%	43%	42%	2.8kg	11.6cm	2.5kg	above
99	10004948	26yrs	primigravidae		cephalic	ft emergengy lscs	msl	female	2.5kg	20-11-2022	03-09-2023	no	40+1	good	term	29cm	adequate	2635gms	10%	25%	43%	42%	2.8kg	11.6cm	2.5kg	above
100	10004939	28yrs	primigravidae		cephalic	ft emergengy lscs	cdmr	male	2.5kg	01-12-2022	07-09-2023	no	39+4	good	term	29cm	adequate	2635gms	10%	25%	43%	42%	2.8kg	11.6cm	2.5kg	above
101	10005103	28yrs	g2a1		cephalic	ftnd		male	3.6kg	07-12-2022	14-09-2023	no	39	good	term	32cm	adequate	3255gms	80%	47%	95%	82%	3kg	13.2cm	3.6kg	below
102	10005101	25yrs	g3a1		cephalic	ft emergengy lscs	dta	female	3.6kg	18-12-2022	24-09-2023	no	39	good	term	32cm	adequate	3255gms	80%	47%	95%	82%	3kg	13.2cm	3.6kg	below
103	10004988	26yrs	g2p1l1		cephalic	ft elective lscs	previous lscs in labour	male	3.6kg	06-12-2022	13-09-2023	no	38+6	good	term	32cm	adequate	3255gms	80%	47%	95%	82%	3kg	13.2cm	3.6kg	below
104	10605340	20yrs	primigravidae		cephalic	ft emergengy lscs	cdmr	female	3.1kg	14-11-2022	16-09-2023	no	39	good	term	30cm	adequate	2790gms	62%	58%	70%	82%	3.3kg	12.02cm	3.1kg	above
105	10005635	25yrs	g3p2l2		cephalic	ftnd		female	3.1kg	04-12-2022	10-09-2023	no	39+3	good	term	30cm	adequate	2790gms	62%	58%	70%	82%	3.3kg	12.02cm	3.1kg	above
106	100005562	26yrs	g3p1l1a1		cephalic	ft elective lscs	previous lscs not willing for vbac	female	3kg	10-11-2022	17-08-2023	no	38+4	good	term	30cm	adequate	2790gms	62%	58%	70%	82%	3.3kg	12.02cm	3kg	above
107	10005330	26yrs	primigravidae		cephalic	ftvd		female	3.1kg	30-11-2022	06-09-2023	no	39+3	good	term	31cm	adequate	2945gms	62%	58%	70%	82%	3.3kg	12.02cm	3.1kg	above
108	10005719	25yrs	g5p2l2a2		cephalic	ftnd		female	2.8kg	01-12-2022	07-09-2023	no	40	good	term	28cm	adequate	2472gms	25%	92%	15%	75%	2.8kg	8cm	2.8kg	below
109	10005934	26yrs	primigravidae		cephalic	ftnd		female	3.1kg	09-12-2022	15-09-2023	no	40	good	term	30cm	adequate	2945gms	8%	4%	5%	6%	2.4kg	9.2cm	3.1kg	below
110	10005910	26yrs	g2a1		cephalic	ft elective lscs	msl	female	2.8kg	21-12-2022	27-09-2023	no	39	good	term	30cm	adequate	2945gms	15%	53%	37%	38%	2.6kg	7cm	2.8kg	below
111	10014475	26yrs	g2p1l1		cephalic	ft elective lscs	precious pregnancy	male	3.6kg	19-01-2022	26-10-2023	no	38+6	good	term	30cm	adequate	2945gms	67%	81%	37%	95%	3.06kg	7.7cm	3.61kg	below
112	10014688	26yrs	g2p1l1		cephalic	ft elective lscs	precious pregnancy	female	3.7kg	20-01-2022	27-10-2023	no	38+4	good	term	32cm	adequate	3255gms	80%	47%	95%	82%	3.4kg	13.2cm	3.7kg	below
113	10014642	27yrs	g4p1l1a2		cephalic	ft elective lscs	msl	female	2.8kg	15-01-2022	22-10-2023	no	39+2	good	term	28cm	adequate	2400gms	25%	92%	15%	75%	2.8kg	8cm	2.8kg	below
114	10014698	26yrs	g4p1l1a2		cephalic	ft elective lscs	previous 2 lscs	female	2.85kg	25-01-2022	01-11-2023	no	37+6	good	term	28cm	adequate	3200gms	63%	69%	88%	70%	3.1kg	8cm	2.85kg	below

S.no	IP NO.	Age in years	Parity		Presentation	Mode of delivery	Indication for LSCS	Baby gender	Birth Weight	LMP	EDD	CEDD	Gestational age	Accuracy of dating	Uterine size	Symphysio-fundal height	Liquor	Clinical Estimated fetal weight	BPD	HC	AC	FL	EFW	AFI	Actual birth weight	head relation to spines
115	10014653	26yrs	primigravidae		cephalic	ft emergengy lscs	failed induction	male	3.2kg	25-01-2022	01-11-2023	no	39+2	good	term	28cm	adequate	3200gms	70%	90%	57%	16%	3.4kg	10.4cm	3.2kg	above
116	10014594	34yrs	g2p1l1		cephalic	ft elective lscs	previous lscs in labour	male	2.8kg	16-01-2022	23-10-2023	no	39+1	good	term	28cm	adequate	3200gms	63%	69%	88%	70%	3.1kg	8cm	2.85kg	above
117	10015225	23yrs	primigravidae		cephalic	ftnd		male	2.9kg	25-01-2022	01-11-2023	no	38+3	good	term	30cm	adequate	2790gms	50%	42%	57%	90%	3kg	9.08cm	2.9kg	above
118	10015709	25yrs	g2p1l1		cephalic	ftnd		male	2.8kg	24-01-2023	31-10-2023	no	38+5	good	term	30cm	adequate	2790gms	50%	42%	57%	90%	3kg	9.08cm	2.9kg	above
119	10015670	24yrs	g2a1		cephalic	ft emergengy lscs	cpd	male	3.4kg	15-01-2022	22-10-2023	no	39+6	good	term	32cm	adequate	3255gms	50%	95%	75%	50%	3kg	9.01cm	3.4kg	below
120	10015761	26yrs	g4p1l1a2		cephalic	ft emergengy lscs	cpd	male	3.4kg	15-01-2022	22-10-2023	no	39+6	good	term	32cm	adequate	3255gms	50%	95%	75%	505	3kg	9.01cm	3.4kg	below
121	10015749	26yrs	g2p1l1		cephalic	ft emergengy lscs	cdmr	female	2.2kg	05-02-2022	12-11-2023	no	37	good	term	27cm	adequate	2400gms	8%	4%	45%	48%	2.45kg	9.2cm	2.24kg	above
122	10011050	25yrs	g3p1l1a1		cephalic	ft emergengy lscs	previous lscs in labour	female	2.7kg	03-01-2022	26-09-2023	no	39	good	term	28cm	adequate	2472gms	25%	92%	15%	75%	2.8kg	8cm	2.7kg	below
123	10011430	26yrs	g2p1l1		cephalic	ft elective lscs	cpd	female	3.1kg	23-12-2022	09-10-2023	no	38	good	term	33cm	adequate	3200gms	33%	50%	72%	50%	3kg	8.02cm	3.1kg	above
124	10015008	29yrs	primigravidae		cephalic	ft emergengy lscs	cpd	male	3.3kg	06-01-2022	13-10-2023	no	40	good	term	35cm	adequate	3255gms	67%	31%	75%	62%	3.4kg	14.9cm	3.3kg	above
125	10014929	26yrs	g2p1l1		cephalic	ft emergengy lscs	previous lscs in labour	male	3kg	23-01-2022	30-10-2023	no	38+2	good	term	35cm	adequate	3255gms	42%	61%	62%	62%	2.9kg	13.5cm	3kg	above
126	10015636	25yrs	primigravidae		cephalic	ft emergengy lscs	nonreassuring nst	male	2.6kg	13-01-2022	01-11-2023	no	38+4	good	term	35cm	adequate	3255gms	26%	61%	31%	38%	2.4kg	7.8cm	2.6kg	below
127	10013040	28yrs	g3a2		cephalic	ft emergengy lscs	npl	male	2.8kg	13-01-2022	01-11-2023	no	37+6	good	term	28cm	adequate	3200gms	75%	75%	92%	82%	3.2kg	7.38cm	2.8kg	above
128	7202355	26yrs	g2a1		cephalic	ft emergengy lscs	non reassuring nst	female	3kg	11-01-2022	18-10-2023	no	40	good	term	35cm	adequate	3255gms	67%	44%	56%	77%	3.2kg	11.6cm	3kg	above
129	10018314	25yrs	primigravidae		cephalic	ft emergengy lscs	msl with fetal distress	female	3.1kg	01-02-2022	08-11-2023	no	39+2	good	term	30cm	adequate	2945gms	81%	91%	65%	69%	3.2kg	16.6cm	3.2kg	below
130	10017868	26yrs	g2a1		cephalic	ft emergengy lscs	severe pre eclampsia	male	3kg	02-02-2022	09-11-2023	no	39+1	good	term	29cm	adequate	2790gms	96%	72%	19%	33%	2.8kg	6.6cm	3kg	below
131	10018642	26yrs	g3a2		cephalic	ft elective lscs	msl with fetal distress	male	3.6kg	30-01-2022	06-11-2023	no	38+4	good	term	30cm	adequate	2945gms	67%	81%	37%	95%	3.06kg	7.7cm	3.6kg	below
132	10018585	26yrs	primigravidae		cephalic	ftnd		female	3.6kg	30-01-2022	06-11-2023	no	38+4	good	term	30cm	adequate	2945gms	67%	81%	37%	95%	3.06kg	7.7cm	3.6kg	below
133	10024215	25yrs	primigravidae		cephalic	ft emergengy lscs	non reassuring nst	male	2.23kg	17-03-2022	29-12-2023	no	38+4	good	term	30cm	adequate	2945gms	67%	81%	37%	95%	3.06kg	7.7cm	2.23kg	below
134	10011050	26yrs	g3p1l1a1		cephalic	ft emergengy lscs	non reassuring nst	female	2.7kg	03-01-2022	26-09-2023	no	39	good	term	28cm	adequate	2472gms	25%	92%	15%	75%	2.8kg	8cm	2.7kg	below
135	10011430	25yrs	g2p1		cephalic	ft elective lscs	cpd	female	3.1kg	23-12-2022	09-10-2023	no	38	good	term	33cm	adequate	3200gms	33%	50%	72%	50%	3kg	8cm	3kg	above
136	10015008	29yrs	primigravidae		cephalic	ft emergengy lscs	cpd	male	3.3kg	06-01-2022	13-10-2023	no	40	good	term	35cm	adequate	3255gms	67%	31%	75%	62%	3.4kg	10cm	3.3kg	below
137	10014929	28yrs	g2p1l1a1		cephalic	ft emergengy lscs	previous lscs not willing for vbac	male	3kg	23-01-2022	30-10-2023	no	38+2	good	term	35cm	adequate	3255gms	42%	61%	62%	62%	2.9kg	13.5cm	2.9kg	below
138	10015636	26yrs	primigravidae		cephalic	ft emergengy lscs	non reassuring nst	female	3kg	13-01-2022	01-11-2023	no	38+4	good	term	35cm	adequate	3255gms	26%	61%	31%	38%	2.04kg	7.8cm	2.9kg	below
139	7202355	25yrs	g2a1		cephalic	ft emergengy lscs	non reassuring nst	female	3kg	11-01-2022	18-10-2023	no	40	good	term	35cm	adequate	3255gms	67%	44%	56%	77%	3.2kg	11.6cm	3kg	below
140	10018539	28yrs	g2p1l1		cephalic	ftnd		female	3.3kg	06-02-2022	13-11-2023	no	38+5	good	term	30cm	adequate	2945gms	67%	81%	37%	95%	3.06kg	7.7cm	3.3kg	below
141	10018289	25yrs	g4p2l2a1		cephalic	ft elective lscs	cdmr	male	3.3kg	04-02-2022	11-11-2023	no	38+6	good	term	30cm	adequate	2945gms	67%	81%	37%	95%	3.06kg	7.7cm	3.3kg	below
142	10025046	26yrs	primigravidae		cephalic	ftnd		male	2.5kg	07-03-2023	12-12-2023	no	39	good	term	29cm	adequate	2635gms	45%	62%	25%	50%	2.79kg	10.5cm	2.7kg	above
143	6614655	28yrs	g2p1l1		cephalic	ftvd		male	2.9kg	10-03-2023	15-12-2023	no	39+1	good	term	30cm	adequate	2945gms	75%	25%	57%	75%	2.8kg	9.7cm	2.9kg	below
144	10024210	28yrs	g2p1l1		cephalic	ft elective lscs	cdmr	male	2.9kg	02-03-2023	07-12-2023	no	39+1	good	term	30cm	adequate	2945gms	75%	25%	57%	75%	2.9kg	9.7cm	2.9kg	below
145	10030564	28yurs	g2a1		cephalic	ft ventouse delivery		male	3.5kg	10-04-2023	01-01-2024	no	39+3	good	term	32cm	adequate	3100gms	18%	12%	27%	38%	3kg	10.2cm	3.1kg	above
146	10013443	28yrs	g2p1l1		cephalic	ft emergengy lscs	previous lscs in labour	male	3.5kg	05-01-2023	12-10-2023	no	40wks	good	term	32cm	adequate	3100gms	18%	12%	27%	38%	3kg	10.2cm	3.1kg	above
147	10023983	27yrs	g2p1l1		cephalic	ft elective lscs	previous lscs in labour	female	3.5kg	01-03-2023	16-12-2023	no	38+3	good	term	32cm	adequate	3100gms	18%	12%	27%	38%	3.1kg	10.2cm	3.2kg	above
148	10012192	28yrs	g2p1l1		cephalic	ft emergengy lscs	failed induction	female	3.5kg	14-01-2023	21-10-2023	no	38	good	term	32cm	adequate	3100gms	18%	12%	27%	38%	3.2kg	10.2cm	3.5kg	above
149	10013398	28yrs	primigravidae		cephalic	ft emergengy lscs	previous lscs in labour	female	2.75kg	07-01-2023	14-10-2023	no	39	good	term	29cm	adequate	2635gms	42%	79%	38%	2%	2.6kg	7.1cm	2.75kg	above
150	10026270	26yrs	g2p1l1		cephalic	ft emergengy lscs	previous lscs in labour	female	2.75kg	11-03-2023	16-12-2023	no	39+3	good	term	29cm	adequate	2635gms	42%	79%	38%	2%	2.6kg	10.2cm	2.75kg	above
151	7203513	26yrs	g2p1l1		cephalic	ft emergengy lscs	previous lscs not willing for vbac	female	2.5kg	08-03-2023	13-12-2023	no	39+6	good	term	29cm	adequate	2635gms	45%	62%	25%	50%	2.7kg	10.5cm	2.5kg	above
152	10037218	28yrs	primigravidae		cephalic	ft emergengy lscs	thick msl	male	3.2kg	27-04-2023	01-02-2024	no	39+4	good	term	32cm	adequate	3255gms	50%	84%	84%	67%	3.1kg	9cm	3.2kg	below
153	10036538	26yrs	primigravidae		cephalic	ft elective lscs	cdmr	male	2.9kg	06-05-2023	10-Feb	no	38+5	good	term	30cm	adequate	2790gms	50%	84%	84%	67%	3.1kg	9cm	2.9kg	above
154	10037903	28yrs	primigravidae		cephalic	ft elective lscs	cdmr	female	3kg	10-05-2023	14-02-2024	no	38+2	good	term	30cm	adequate	2945gms	10%	92%	79%	90%	2.8kg	10.01cm	3.2kg	below
155	10037392	27yrs	g2p1l1		cephalic	ft elective lscs	cdmr	female	2.8kg	05-08-2023	18-02-2024	no	38+5	good	term	32cm	adequate	3255gms	15%	53%	37%	38%	2.6kg	7cm	2.8kg	below
156	10038339	27yrs	primigravidae		cephalic	ft elective lscs	cdmr	female	3.3kg	02-05-2023	06-02-2024	no	39+6	good	term	32cm	adequate	3100gms	75%	94%	66%	92%	3.4kg	8.1cm	3.3kg	above
157	10038328	27yrs	primigravidae		cephalic	ft elective lscs	cdmr	male	3.3kg	02-05-2023	06-02-2024	no	39+6	good	term	32cm	adequate	3100gms	75%	94%	66%	92%	3.4kg	8.1cm	3.3kg	above
158	10038380	28yrs	primigravidae		cephalic	ft emergengy lscs	msl with fetal distress	male	2.5kg	05-08-2023	18-02-2024	no	39+4	good	term	28cm	adequate	2635gms	17%	18%	44%	38%	2.8kg	11.1cm	2.5kg	below
159	10038607	27yrs	g2p1l1		cephalic	ft emergengy lscs	msl with fetal distress	male	2.5kg	05-08-2023	18-02-2024	no	39+4	good	term	28cm	adequate	2635gms	17%	18%	44%	38%	2.8kg	11.1cm	2.5kg	below
160	10034252	25yrs	g2p1l1		cephalic	ft emergengy lscs	previous lscs in labour	male	2.8kg	17-04-2023	22-01-2024	no	39+2	good	term	30cm	adequate	2945gms	69%	56%	94%	96%	3.5kg	10cm	2.8kg	below
161	10034128	28yrs	primigravidae		cephalic	ft emergengy lscs	cpd	male	2.8kg	09-03-2023	14-12-2023	no	38+3	good	term	32cm	adequate	3100gms	15%	6%	48%	96%	2.8kg	11.7cm	2.8kg	above
162	10033728	28yrs	primigravidae		cephalic	ft emergengy lscs	fetal distress	female	2.7kg	10-04-2023	15-01-2024	no	38	good	term	31cm	adequate	3100gms	67%	61%	16%	50%	3.2kg	10.9cm	3.2kg	below
163	10033732	28yrs	g5p2l2a2		cephalic	ft elective lscs	previous 2 lscs	male	2.7kg	27-04-2023	01-02-2024	no	39	good	term	31cm	adequate	3100gms	10%	16%	52%	67%	2.8kg	10cm	2.7kg	below
164	10033849	25yrs	primigravidae		cephalic	ft emergengy lscs	cpd	female	3.3kg	04-03-2023	09-12-2023	no	38+4	good	term	31cm	adequate	3100gms	67%	81%	37%	95%	3.06kg	7.7cm	3.3kg	below
165	10038848	26yrs	primigravidae		cephalic	ft emergengy lscs	failed induction	female	3.1kg	05-05-2023	09-02-2024	no	39+4	good	term	30cm	adequate	2945gms	5%	6%	22%	19%	3.1kg	15cm	3.1kg	below
166	10039645	26yrs	primigravidae		cephalic	ft emergengy lscs	previous lscs in labour	female	3kg	24-05-2023	28-Feb	no	39+6	good	term	32cm	adequate	3255gms	80%	47%	95%	82%	3kg	10cm	3kg	below
167	10037725	28yrs	primigravidae		cephalic	ft elective lscs	cdmr	male	3.6kg	31-05-2023	06-03-2024	no	38+6	good	term	30cm	adequate	2945gms	67%	81%	37%	95%	3.06kg	7.7cm	3.6kg	below
168	10039929	26yrs	g3p1l1a1		cephalic	ft elective lscs	previous lscs in labour	male	2.6kg	25-04-2023	19-02-2024	no	39+6	good	term	28cm	adequate	2472gms	25%	92%	15%	75%	2.8kg	8cm	2.7kg	below
169	10040526	27yrs	primigravidae		cephalic	ft emergengy lscs	cpd in labour	female	2.75kg	12-05-2023	16-02-2024	no	39+4	good	term	28cm	adequate	2472gms	25%	92%	15%	75%	2.8kg	8cm	2.7kg	below
170	10040984	27yrs	g2p1l1		cephalic	ft elective lscs	cdmr	female	2.8kg	23-05-2023	27-02-2024	no	40		term	28cm	adequate	2472gms	25%	92%	15%	75%	2.8kg	8cm	2.8kg	below
171	10042303	28yrs	g4p3l2d1		cephalic	ftnd		male	3kg	05-06-2023	11-03-2024	no	39+3	good	term	31cm	adequate	3100gms	5%	9%	5%	34%	2.8kg	12.6cm	3kg	below

S.no	IP NO.	Age in years	Parity		Presentation	Mode of delivery	Indication for LSCS	Baby gender	Birth Weight	LMP	EDD	CEDD	Gestational age	Accuracy of dating	Uterine size	Symphysio-fundal height	Liquor	Clinical Estimated fetal weight	BPD	HC	AC	FL	EFW	AFI	Actual birth weight	head relation to spines
172	10042538	26yrs	primigravidae		cephalic	ftvd		male	2.8kg	16-05-2023	20-02-2024	no	38+4	good	term	31cm	adequate	3100gms	2%	47%	50%	50%	2.7kg	10.8cm	2.8kg	below
173	10042621	28yrs	primigravidae		cephalic	ft ventouse delivery		male	2.9kg	26-06-2023	29-02-2024	no	39	good	term	30cm	adequate	2635gms	98%	75%	13%	50%	2.9kg	8.3cm	2.9kg	above
174	10042895	28yrs	primigravidae		cephalic	ftnd		female	3.1kg	20-05-2023	24-02-2024	no	38+4	good	term	30cm	adequate	2945gms	98%	91%	93%	82%	3.4kg	9cm	3.4kg	above
175	10046047	25yrs	primigravidae		cephalic	ft emergengy lscs	cpd	male	2.8kg	12-06-2023	18-03-2024	no	39+2	good	term	30cm	adequate	2945gms	69%	56%	94%	96%	3.5kg	10cm	3.5kg	below
176	10045995	25yrs	primigravidae		cephalic	ft elective lscs	failed induction	male	2.8kg	09-06-2023	15-03-2024	no	39+1	good	term	30cm	adequate	2945gms	69%	56%	94%	96%	3.5kg	10cm	2.8kg	below
177	10049432	28yrs	primigravidae		cephalic	ft emergengy lscs	previous lscs in labour	female	2.8kg	03-07-2023	05-04-2024	no	38+3	good	term	32cm	adequate	3255gms	53%	61%	66%	84%	2.7kg	12.3cm	2.8kg	below
178	10047552	26yrs	g4p2l2a1		cephalic	ftnd		male	2.8kg	21-06-2023	27-03-2024	no	38+3	good	term	32cm	adequate	3255gms	53%	61%	60%	84%	2.7kg	12.3cm	2.8kg	below
179	10047229	26yrs	primigravidae		cephalic	ft emergengy lscs	cdmr	male	3.2kg	17-06-2023	23-03-2024	no	38+6	good	term	32cm	adequate	3255gms	33%	56%	30%	75%	2.9kg	10.4cm	3.2kg	below
180	10049139	26yrs	g2p1l1		cephalic	ft elective lscs	previous lscs in labour	female	2.7kg	26-06-2023	01-04-2024	no	38+4	good	term	28cm	adequate	2472gms	25%	92%	15%	75%	2.8kg	8cm	2.7kg	below
181	10048623	27yrs	primigravidae		cephalic	ft emergengy lscs	failed induction	female	2.7kg	19-06-2023	25-03-2024	no	39+3	good	term	28cm	adequate	2472gms	25%	92%	15%	75%	2.8kg	8cm	2.7kg	below
182	10046509	28yrs	g2p1l1		cephalic	ft emergengy lscs	previous lscs in labour	male	3.4kg	17-06-2023	23-03-2024	no	38+3	good	term	31cm	adequate	2945gms	25%	92%	15%	75%	2.8kg	8cm	3.4kg	above
183	10046639	27yrs	g2a1		cephalic	ftvd		female	2.9kg	29-05-2023	14-03-2024	no	39+4	good	term	30cm	adequate	2945gms	98%	75%	13%	50%	2.9kg	8.3cm	2.9kg	below
184	10047208	28yrs	g2p1d1		cephalic	ft elective lscs	previous lscs not willing for vbac	female	2.9kg	20-06-2023	26-03-2024	no	38+3	good	term	31cm	adequate	3100gms	98%	91%	93%	82%	3.4kg	10cm	2.9kg	below
185	10049389	26yrs	g2a1		cephalic	ft emergengy lscs	cpd	male	3.4kg	15-01-2023	22-10-2023	no	39+6	good	term	32cm	adequate	3255gms	50%	95%	75%	50%	3.5kg	9.01cm	3.4kg	below
186	10049391	25yrs	g2a1		cephalic	ftvd		female	3kg	04-03-2023	9/12/223	no	39+2	good	term	29cm	adequate	2790gms	96%	72%	19%	33%	2.4kg	7.8cm	3kg	below
187	10049432	27yrs	g2p1l1		cephalic	ft emergengy lscs	cdmr	female	2.24kg	05-02-2023	12-11-2023	no	38+2	good	term	27cm	adequate	2400gms	96%	72%	19%	33%	2.4kg	7.8cm	3kg	below
188	10049432	28yrs	g4p1l1a2		cephalic	ft emergengy lscs	cdmr	female	3kg	19-01-2023	26-10-2023	no	39+3	good	term	31cm	adequate	3621gms	92%	74%	87%	82%	3.5kg	10.4cm	3kg	below
189	10048868	27yrs	primigravidae		cephalic	ft emergengy lscs	non reassuring nst	female	2.6kg	13-01-2023	01-11-2023	no	38+4	good	term	30cm	adequate	2815gms	26%	61%	31%	38%	2.4kg	7..1cm	2.4kg	above
190	10049139	25yrs	g4p2l2a1		cephalic	ft elective lscs	cdmr	female	3.3kg	04-02-2022	11-11-2023	no	38+6	good	term	30cm	adequate	2945gms	67%	81%	37%	95%	3.06kg	7.7cm	3.3kg	below
191	10047561	28yrs	primigravidae		cephalic	ft emergengy lscs	thick msl	male	3.2kg	27-04-2023	01-02-2024	no	39+4	good	term	32cm	adequate	3255gms	50%	84%	84%	17%	3.1kg	9cm	3.2kg	below
192	10049066	27yrs	primigravidae		cephalic	ft elective lscs	cdmr	male	2.9kg	06-05-2023	10-02-2024	no	38+5	good	term	30cm	adequate	2790gms	50%	84%	84%	67%	3.3kg	9cm	2.9kg	above
193	10048237	26yrs	primigravidae		cephalic	ft elective lscs	cdmr	female	3kg	10-05-2023	14-02-2024	no	38+2	good	term	30cm	adequate	2945gms	10%	92%	79%	90%	2.8kg	10.01cm	3.2kg	below
194	10048611	25yrs	g2p1l1		cephalic	ft elective lscs	cdmr	female	2.8kg	05-08-2023	18-02-2024	no	38+5	good	term	32cm	adequate	3255gms	15%	53%	37%	38%	2.6kg	7cm	2.6kg	below
195	10048907	26yrs	primigravidae		cephalic	ft elective lscs	cdmr	female	3.3kg	02-05-2023	06-02-2024	no	39+6	good	term	32cm	adequate	3100gms	75%	94%	66%	92%	3.4kg	8.1cm	3.3kg	above
196	10048623	26yrs	primigravidae		cephalic	ft elective lscs	cdmr	male	3.3kg	02-05-2023	06-02-2024	no	39+5	good	term	32cm	adequate	3100gms	75%	94%	66%	92%	3.4kg	8.1cm	3.3kg	above
197	10048637	27yrs	primigravidae		cephalic	ft emergengy lscs	msl with fetal distress	male	2.5kg	05-08-2023	18-02-2024	no	39+4	good	term	28cm	adequate	2635gms	17%	18%	44%	38%	2.8kg	11.1cm	2.5kg	below
198	10048539	27yrs	g2p1l1		cephalic	ft emergengy lscs	msl with fetal distress	male	2.5kg	05-08-2023	18-02-2024	no	39+4	good	term	28cm	adequate	2635gms	17%	18%	44%	38%	2.8kg	11.1cm	2.5kg	below
199	10048484	26yrs	g2p1l1		cephalic	ft emergengy lscs	non progress of labour	male	2.9kg	28-12-2022	04-10-2023	no	39+1	good	term	29cm	adequate	2635gms	20%	46%	48%	50%	2.8kg	11.1cm	2.8kg	below
200	10048838	25yrs	g3p1l1a1		cephalic	ftvd		male	2.8kg	02-12-2022	08-09-2023	no	38	good	term	28cm	adequate	2635gms	20%	44%	18%	18%	2.8kg	10.2cm	2.8kg	below