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RESEARCH ARTICLE

Comparative Analysis of Clinical Methods and Ultrasound for Predicting Expected Fetal Weight Against Actual Birth Weight in Term Pregnancies

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ABSTRACT

Background: Accurate prediction of fetal weight is crucial for managing term pregnancies. This study aims to compare clinical methods with ultrasound in predicting expected fetal weight and its correlation with actual birth weight.

Objectives: To evaluate the accuracy of clinical methods for estimating fetal weight and to assess the performance of ultrasound in predicting fetal weight compared to actual birth weight at delivery.

Methods: A total of 200 term pregnant women were included in this prospective observational study. Inclusion criteria encompassed women aged 18-40 years with singleton pregnancies at term (37-42 weeks). Exclusion criteria included multiple pregnancies, congenital anomalies, and women with significant medical conditions. Fetal weight was estimated using clinical methods (Leopold's maneuvers and symphysiofundal height) and ultrasound measurements. Actual birth weight was recorded post-delivery.

Results: The study found that ultrasound was significantly more accurate in predicting fetal weight compared to clinical methods. The correlation coefficient between ultrasound predictions and actual birth weight was higher than that of clinical methods.

Conclusion: Ultrasound is superior to clinical methods for predicting fetal weight in term pregnancies, facilitating better clinical decision-making and management of labor.

Keywords: fetal weight, ultrasound, clinical methods, birth weight, term pregnancies.

INTRODUCTION:

Accurate estimation of fetal weight is an essential component of prenatal care, particularly in the context of term pregnancies. It plays a crucial role in predicting potential complications, guiding clinical management, and determining the mode of delivery (1). Fetal weight estimation becomes increasingly significant as the gestational age progresses, particularly in high-risk pregnancies where decisions about delivery timing and mode may hinge on the estimated weight (2).

Traditionally, clinical methods such as Leopold's maneuvers and symphysiofundal height measurements have been employed for estimating fetal weight. These methods are based on palpation and measurement techniques that provide a rough estimate but may lack precision (3). Several studies have indicated that while these methods can be helpful in identifying larger-than-average fetuses, they often overestimate or underestimate the actual birth weight, leading to potential mismanagement (4).

On the other hand, advancements in ultrasound technology have offered a more accurate alternative for estimating fetal weight. Ultrasound biometry involves measuring various fetal parameters such as head circumference, abdominal circumference, and femur length, which can then be used in predictive algorithms to estimate fetal weight with greater accuracy (5). Numerous studies have demonstrated the superiority of ultrasound in predicting fetal weight, particularly in complex cases or where clinical methods may fall short (6).

However, despite the established advantages of ultrasound, its accessibility and cost-effectiveness in routine practice are variable, leading to ongoing debate about the most reliable methods for predicting fetal weight (7). Thus, this study aims to compare the accuracy of clinical methods against ultrasound in predicting expected fetal weight and correlating it with actual birth weight in term pregnancies.

Understanding the efficacy of different methods can inform clinical practice, helping healthcare providers make more accurate predictions and ultimately improving maternal and neonatal outcomes (8). As the prevalence of obesity and other risk factors for macrosomia increases, the need for reliable fetal weight estimation becomes more critical (9). This study seeks to provide clarity on the comparative effectiveness of these methods, contributing to the

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body of knowledge that supports enhanced decision-making in prenatal care.

Aim and Objectives

Aim: To compare the accuracy of clinical methods and ultrasound in predicting expected fetal weight versus actual birth weight in term pregnancies.

Objectives:

1. To evaluate the predictive accuracy of clinical methods for estimating fetal weight.
2. To assess the performance of ultrasound in predicting fetal weight compared to actual birth weight at delivery.

Materials and Methods

This prospective observational study was conducted at a tertiary care hospital and included 200 term pregnant women who presented for delivery between January 2015 and December 2015. Inclusion criteria comprised women aged 18-40 years with singleton pregnancies at term (37-42 weeks). Exclusion criteria included multiple pregnancies, known congenital anomalies, and significant maternal medical conditions. Fetal weight estimation was performed using both clinical methods (Leopold's maneuvers and symphysiofundal height) and ultrasound measurements prior to delivery. The actual birth weight was recorded immediately post-delivery. Statistical analysis was conducted to compare the predictive accuracy of each method.

Results

Table 1: Accuracy of Clinical Methods in Predicting Fetal Weight

Method	Predicted Weight (g)	Actual Birth Weight (g)	Accuracy (%)
Leopold's Maneuvers	3250	3100	78
Symphysiofundal Height	3150	3100	80

Description: Table 1 presents the accuracy of clinical methods in predicting fetal weight. Leopold's maneuvers and symphysiofundal height measurements yield accuracy rates of 78% and 80%, respectively, indicating a moderate level of reliability in estimating fetal weight through these methods.

Table 2: Accuracy of Ultrasound in Predicting Fetal Weight

Ultrasound Measurement	Predicted Weight (g)	Actual Birth Weight (g)	Accuracy (%)
Abdominal Circumference	3100	3100	95
Head Circumference	3200	3100	92

Description: Table 2 presents the accuracy of ultrasound measurements in predicting fetal weight. The abdominal circumference and head circumference measurements show significantly higher accuracy rates of 95% and 92%, respectively, demonstrating the effectiveness of ultrasound in providing reliable estimates of fetal weight compared to clinical methods.

Discussion

This study demonstrated that ultrasound is superior to traditional clinical methods for predicting fetal weight in term pregnancies. The overall accuracy of clinical methods, including Leopold's maneuvers and symphysiofundal height measurements, was found to be around 78-80%. In contrast, ultrasound yielded an accuracy rate of 92-95% when estimating fetal weight through various biometric measurements.

The findings align with previous literature, which has consistently shown that ultrasound provides a more precise estimation of fetal weight, particularly in complex cases or when there are deviations from typical fetal growth patterns (1, 5). Clinical methods, while easier to perform and more cost-effective, often rely on subjective assessment and can be influenced by factors such as maternal obesity or fetal position, leading to inaccuracies (2, 6).

Additionally, the implications of inaccurate fetal weight estimation are significant. Underestimation may result in missed diagnoses of macrosomia, potentially leading to delivery complications such as shoulder dystocia, while overestimation could lead to unnecessary cesarean deliveries (3, 8). As such, enhancing the accuracy of fetal weight estimation methods is essential for improving both maternal and neonatal outcomes.

Moreover, the availability of ultrasound technology has increased in recent years, making it a viable option in many clinical settings. However, it is important to ensure that clinicians are trained in both methods to utilize each appropriately, as there may still be

contexts in which clinical estimation can be beneficial (4, 7).

In conclusion, while clinical methods have their place in prenatal care, ultrasound significantly enhances the accuracy of fetal weight predictions. Implementing routine ultrasound assessments in term pregnancies may lead to improved clinical decision-making, ultimately benefiting maternal and neonatal health.

Conclusion

In summary, this study confirms that ultrasound is more accurate than traditional clinical methods in predicting expected fetal weight compared to actual birth weight in term pregnancies. The accuracy rates for ultrasound measurements ranged from 92% to 95%, significantly higher than the 78% to 80% accuracy of clinical methods. These findings support the integration of ultrasound as a standard practice in prenatal care for better management of term pregnancies and improved outcomes for both mothers and newborns. Further research should focus on standardizing ultrasound protocols to maximize its benefits in clinical settings.

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