ORIGINAL ARTICLE

Agreement between Clinical and Ultrasonographic Estimation of Abnormal Birth Weight of Term Fetus

FARZANA SABIR[1], SHAZIA SAEED[2], NASREEN AKHTER[3], *SARA AKRAM[4], ROHANA SALAM[5]*

ABSTRACT

Background: The ultrasound examination and estimation of fetal parts has turned an integral part of current obstetric consideration. These estimations can serve for dates of pregnancies and evaluation of fetal development. Foundation of gestational age is imperative for the management of pregnancy, both normal and typical. Exact pre-birth estimation of fetal weight (EFW) in late pregnancy and labour is particularly useful in the management of delivery, allowing obstetricians to settle on decisions about the instruments of vaginal delivery and trial of labour after caesarean section and elective caesarean delivery for patients suspected of having macrosomic embryo.

Aim: To determine the degree of agreement between clinical assessment and ultrasonography in the prediction of abnormal weight of fetus in term pregnancy.

Methodology: This is a descriptive cross-sectional study and carried out at Divisional Head Quarter Hospital, Mirpur Azad Jamu Kashmir from 01-03-2017 to 28-02-2018.

Results: In our study, 59.2% (n=148) were between 18-30 years and 40.8% (n=102) were between 31-40 years of age, Mean±SD was calculated as 28.25±5.02 years, clinical mean weight and ultrasound estimation of fetal weight was calculated as 3106.12±632.88 gram in clinical estimation while 3232.48±641.04 grams were recorded while estimation was done with ultrasound. Degree of agreement between clinical assessment and ultrasonography was calculated which reveals true positive i.e. 177 for both clinical and ultrasound while true negative for both i.e. 51, Kappa statistics were computed as 0.4491 (observed as proportion of maximum possible), which shows a significant agreement. **Conclusion:** •Ultrasound and clinical examination for estimation of birth weight are reliable and significantly agreed while clinical examination may be used for correct estimation where sonographic facilities are not available.

Keywords: Term Pregnant, Prediction of Abnormal Fetal Weight, Clinical Assessment, Ultrasonography, Agreement.

INTRODUCTION

Estimating fetal weight at term helps to determine management of labour and delivery. A woman whose fetus has a high or low weight at term will receive the most appropriate clinical management when the diagnostic techniques are used[1]. Fetal biometry has been in use for the assessment of gestational age and for monitoring growth since the late 1960s[2]. Fetal abdominal circumference measured by ultrasound can help to evaluate the birth weight[3].

Without a sure way of predicting fetal weight making the sound management decision is difficult[4]. Ultrasound is the most sensitive method of assessing fetal growth[5].

Various clinical methods for fetal weight estimation have been surpassed by the more accurate ultrasonographic measurements like abdominal circumference, biparietal diameter, femur length.[3] The two principal fetal growth disorders are macrosomia and intrauterine growth restriction. Fetal macrosomia is excessive fetal growth which is opposite of fetal growth restriction.[6] Ultrasound images has long been used for detection of growth restriction in the developing fetus, utilizing the knowledge that fetus preferentially spares neural and bone development at the expense of peripheral fat store[7]. When managing with anticipated preterm delivery, perinatal guiding on probability of survival, the intervention attempted to postpone preterm delivery, ideal delivery route or the level of centers where delivery should occur may be based entirely or to some extent in light of the estimation of expected birth weight[8].

The maternal uterine fundal height is objectively measured and charted during each antenatal visit. The reported sensitivity of fundal height measurement for the detection of IUGR ranges from 60% to 85% and for macrosomia its sensitivity is 10% to 43%. The abdominal circumference percentile has the sensitivity and negative predictive value for the sonographic diagnosis of IUGR.[6] In diabetic patients, the post test likelihood of distinguishing an infant gauging >4000 grams clinically and sonographically is over 63%[9].

The sonographic estimation of abdominal fetal circumference enables to identify the greater part of cases of small for gestational age at birth and more than two third of cases of macrosomia with adequate false positive rates. For the predication of small for gestational age using abdominal circumference, sensitivity, and specificity were 53% and 81% respectively[10]. For the prediction of macrosomic fetus using abdominal circumference sensitivity, specificity is 87.5% and 84.7% respectively[4]. The estimation of ultrasound for the weight of fetal in term pregnancies is utilized to decide growth and this may influence the timing and delivery route[11,12]. Clinical estimation is as accurate as ultrasound assessment of birth weight, so that clinical estimation can be used where ultrasound equipment is not available. The high perinatal mortality is as yet a noteworthy reason in developing countries like Pakistan, a huge segment of this issue is identified with birth weight which remains the absolute most imperative parameter that decides neonatal survival[8].

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[1]Senior Registrar, Gynae & Obs.
[2,3,5]Associate Professor, Gynae & Obs.
[4]Assistant Professor Gynae & Obs.
Department of Obstetrics & Gynaecology, DHQ Hospital, Mirepur, AJK
Correspondence to: Dr. Farzana Email:farysabir@hotmail.com

RESULTS

A total of 250 cases fulfilling the inclusion/exclusion criteria were enrolled to determine the degree of agreement between clinical assessment and Ultrasonography in the prediction of abnormal weight fetus in term pregnant. Age distribution of the patients was done which shows that 148(59.2%) were between 18-30 years and 102(40.8%) were between 31-40 years of age, Mean±SD was calculated as 28.25±5.02 years (Table 1). Gestational age (in weeks) was calculated which shows that 154(61.6%) were between 37-39 weeks while 96(38.4%) were between 40-41 weeks of gestation, Mean±SD was calculated as 38.98±2.75 weeks (Table 2). Mean weight of clinical estimation of fetal weight was calculated as 3106.12±632.88 gram in clinical estimation while 3232.48±641.04 grams was recorded while estimation was done with ultrasound (Table 3). Degree of agreement between clinical assessment and ultrasonography was calculated which reveals true positive i.e. 177 for both clinical and ultrasound while true negative for both i.e., 51, Kappa statistics were computed as 0.4491 which shows a significant agreement (Table 4).

Table 1: Age Distribution (n=250)

Age (in years)	n	%
18-30	148	59.2
31-40	102	40.8
Total	250	100
Mean±SD	28.25±5.02	

Table 2: Gestational Age (n=250)

Gestational Age (in weeks)	n	%
37-39	154	61.6
40-41	96	38.4
Total	250	100
Mean±SD	38.98±2.75	

Table 3: Mean Weight of Clinical and Ultrasound Estimation of Fetal Weight (n=250)

Weight estimation	Mean±SD
Clinical estimation	3106.12±632.88
Ultrasound estimation	3232.48±641.04

Table 4: Degree of Agreement Between Clinical Assessment and Ultrasonography in The Prediction of Abnormal Weight Fetus in Term Pregnant (n=250)

Ultrasound	Clinical assessment	
	Yes	No
Yes	177	10
No	12	51
Total	189	61

Kappa statistics= 0.4491
(Observed as proportion of maximum possible)

DISCUSSION

The ultrasound examination and estimation of fetal parts has turned into a necessary piece of current obstetric consideration. These estimations can serve for dating pregnancies or for appraisal of fetal growth[13]. Establishment of gestational age is essential for the management of pregnancy, both normal and typical.

Precise pre-birth estimation of fetal weight (EFW) in late pregnancy and labour is extremely valuable in the management of labour and delivery, allowing obstetricians settle on choices about instrumental vaginal delivery, trial of labour after caesarean delivery and elective caesarean section for patients associated with having macrosomic fetus[14,15].

The current study was evaluated to determine the agreement of clinical and ultrasound in the prediction of abnormal birth weight in term pregnant women. The precise estimation of fetal weight help in fruitful management of labour and care of the infant in the neonatal period and help evasion of complications related with fetal macrosomia, in low birth weight babies, in this manner diminishing perinatal morbidity and mortality.

In our study, 148(59.2%) were between 18-30 years and 102(40.8%) were between 31-40 years of age, Mean±SD was calculated as 28.25±5.02 years, mean weight of clinical and ultrasound estimation of fetal weight was calculated as 3106.12±632.88 gram in clinical estimation while 3232.48±641.04 grams were recorded while estimation was done with ultrasound. Degree of agreement between clinical assessment and ultrasonography was calculated which reveals true positive i.e. 177 for both clinical and ultrasound while true negative for both i.e., 51, Kappa statistics were computed as 0.4491 which shows a significant agreement.

The findings of the study are in agreement with a study by Ashraf Gangooei et al conducted in Iran showed the agreement between clinical assessment and ultrasound in the prediction of abnormal weight is 94% and no significant difference between clinical and sonographic estimates of fetal weght.[11] In another study reported by Noum et al[16] the exact accuracy rate of clinical and sonographic estimations of the fetal weight (EFW) performed during the dynamic period of labor and recorded that clinical EFW was right (within G10%) in 72% of the cases and the sonographic EFW was correct (within G10%) in 74% of the cases. These outcomes likewise supporting the consequences of the current study.

Baum et al presumed that ultrasound offered no favorable position over clinical estimates of fetal weight at term.[17] Mother's evaluations should be seen as equally valid as clinical assessments, particularly in the light of the requirement for realistic, achievable guidelines. They reported that senior resident clinical assessments were better to junior resident estimates. Rather than this examination, we discovered that the precision of physicians' estimates was similar regardless of their length of experience, which occurs with Ben-Aroya et al[18]

In light of the result of this study in support of other studies, the accuracy of clinical estimation of fetal weight was also found good and the estimation has no difference with ultrasonographic estimation, however, the result of the study reveal that where the facility of sonography is not available especially in rural areas, the clinical estimation of fetal birth weight may also be useful.

CONCLUSION

Ultrasound and clinical examination for estimation of birth weight are reliable and significantly agreed while clinical examination may be used for correct estimation where sonographic facilities are not available.

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