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A Study of Assessment of Fetal Weight in Term Pregnancy by Abdominal Girth and Symphysio Fundal Height and Comparison with Actual Birth Weight of Baby

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Abstract

Introduction: Prediction of fetal weight has been a subject which has interested many workers. It is useful for the prevention of prematurity by avoiding delivery of small babies through induction or caesarean section. *Aims and Objectives:* To Study of assessment of fetal weight in term pregnancy by abdominal girth and symphysiofundal height and comparison with actual birth weight of baby. *Methodology:* This was a Prospective Study carried out at medical college and hospital from January 2009 to October 2010 in the department of obstetrics and gynecology. Two hundred women at term were studied. The fetal weight was estimated at the time of admission.The statistical analysis done by SPSS version 17. *Result:* Mean age of mothers was found to be 22.67 years. 59% babies were normally delivered and 24.5% babies were delivered by LSCS. Actual birth weight (Grams) was 2643.00 ±331.14 (Range 2000-3615), while SFHAG (grams) was 2721.45 ± 360.01 (Range 1806 -3534). Error by SFHAG was 78.5 ± 365.4 and (Range -1090.0 to 1398.0). Percent SFHAG Error by SFHAG was 3.9 ± 14.5 (Range -36.9 to 67.9). The SFHAG significantly differed from the Actual birth weight ($P<0.05$). Birth weight determined by SFHAG in 57% babies had an error of more than 200gms. Birth weight by SFHAG was overestimated in 58% babies; of them 35.5% babies were estimated to have birth weight more than 200 gms. In 42% babies birth weight was underestimated and in 21.5% babies had weight determined less than 200gms. *Conclusion:* Clinical palpation is a subjective methodology that must be employed at or near the data of delivery but this method is having much errors in measurement so should be accompanied with other methods of estimation like USG.

Keywords: Symphysio Fundal Height (SFHAG); Mcdonald'Smeasurement, Intrauterine Growth Retardation (IUGR).

Introduction

Obstetrics is a speciality dealing with two lives. Medical ethics denote that fetus is also a patient. Fetal health has great potential for influencing favourably the quality of human offspring.

Prediction of fetal weight has been a subject which has interested many workers. It is useful for the prevention of prematurity by avoiding delivery of small babies through induction or caesarean section. Evaluation of fetopelvic disproportion, decision for mode of delivery in breech presentation and in complications of pregnancy. It can also prove to be valuable in detection of intrauterine growth retardation. Much work has been done to find out accurate methods for estimation of fetal weight and size in utero. However, estimation of fetal weight by clinical methods still has an important place in a developing country like India where ultrasound is not universally available.

The proper clinical management of pregnancy and delivery is greatly influenced by information regarding fetal weight [1-3]. There is no doubt about

the necessity and the importance of estimating fetal weight in utero. Alterations in intrauterine growth, both retardation and acceleration contribute significantly to perinatal morbidity and mortality [4]. accurate antenatal diagnoses of altered fetal growth enables the obstetrician to evaluate and manage these problems more effectively.

Knowledge of the weight of the fetus in utero is important for the obstetrician to decide whether to deliver or not to deliver the fetus and also to decide on the mode of delivery [5]. Estimation of fetal weight is being done clinically. Which has been criticized as less accurate because of observer variations. But Sherman et al [6]. baum JD, Gussman D, wirth JC 3rd7 and titapant V, chawanpaiboons. mingmitpata-nakul K [8] have found clinical estimation quite reliable. Dare et al [9] used the product of symphysi ofundal height and abdominal girth in centimeters in obtaining fairly predictable fetal weight estimation. Furthermore, a precise estimation of fetal weight can be helpful in study of fetal dynamics, especially the fetal blood flow which is correlated to the birth weighit [10].

Any method that accurately estimates fetal weight is obviously of benefit to the practicing clinician. The estimation of fetal weight via palpation of the uterine fundus is known to be notoriously inaccurate, especially at the upper and lower ends of the weight spectrum. Birth weight depends on many factors, including maternal size. Disease, smoking habits, parental race, and constitutional and sociodemographic characteristics.

Aims and Objectives

To Study of assessment of fetal weight in term pregnancy by abdominal girth and symphysio fundal height and comparison with actual birth weight of baby.

Methodology

This was a Prospective Study carried out at medical college and hospital from January 2009 to October 2010 in the department ofobstetrics and gynecology. Two hundred women at term were studied. The fetal weight was estimated at the time of admission. All pregnant women at term were included into study while Multiple gestation, Malpresentation, Polyhydramnios or oligohydramnios, Fibroid or any adnexal masses, any congenital anomalies were excluded from the study. The fetal weight was estimated by using the following three methods:

Weight in grams=abdominal girth (cm) X symphysiofundal height(cm). Abdominal girth was measured at the level of umbilicus. Symphysiofundal height or Mcdonald's measurement was taken after correcting the dextro rotation from the upper border of the symphysis to the height of the fundus. The statistical analysis done by SPSS version 17.

Result

Mean age of mothers was found to be 22.67 years. Of them 18 years' minimum age was seen. Of 52.4 kg as mean weight of study population maximum weight found was 77 kgs. 142 cms. was the minimum height found in 154.61 cms. mean height of mothers.

59% babies were normally delivered and 24.5% babies were delivered by LSCS. Instrumental vaginal delivery was performed in 16.5% mothers.

Table 1: Showing minimum and maximum distribution of age. Weight and height of the mothers

Parameters	N	Mean ± S.D	Minimum	Maximum
Age mother (years)	20	22.67±2.81	18	35
Mother weight(kg)	200	52.80±6.52	40	77
Height of mother(cm)	200	154.61±5.49	142	171

Table 2: Showing mode ofdelivery

Mode of Delivery	Frequency	Present
FTND	118	59%
LSCS	49	24.5%
Instrumental	33	16.5%

Table 3: Showing distribution of actual birth weight and predicted birth weight by SFHAG

Methods	Mean	Std deviation	Minimum	Maximum
Actual birth weight(Grams)	2643.00	331.14	2000	3615
SFHAG(grams)	2721.45	360.01	1806	3534

Table 4: Showing error of the predicted weight from the actual weight

Methods	Mean	Std. deviation	Minimum	Maximum
Error SFHAG	78.5	365.4	-1090.0	1398.0

Table 5: Showing percentage weight error by the predicted methods from the actual weight of the babies

Percent SFHAG Error	**3.9**	**14.5**	**-36.9**	**67.9**

Table 6: Showing comparison of predicted birth weight with dependent variable as actual birth weight

Statistical Analysis		Mean difference (A-B)	Std.error	Sig.	95%confidence interval	
(A)method	(B) method				Lower bound	Upper bound
Actual birth weight	SFHAG (gms)	-78.45	37.36	.036	-151.78	-5.12

Table 7: Showing percentage of accuracy ofSFGHAG Method.

Difference of birth weight	Error SFGHAG	
	Freq.	%
50gms	26	13
100gms	27	13.5
150gms	21	10.5
200gms	12	6
>200gms	114	57
Total	200	100

Birth weight determined by SFHAG in 57% babies had an error of more than 200gms.

Table 8: Showing overestimation and underestimation of the birth weight by SFHAG.

Weight in grams	Overestimation of weight		Underestimation of weight	
	frequency	Percent	frequency	Percent
50 gms	12	6.0	14	7.0
51 to 100gms	10	5.0	17	8.5
101 to 150 gms	14	7.0	7	3.5
151 to 200 gms	9	4.5	3	1.5
>200 gms	71	35.5	43	21.5
Total	116	58	84	42

Actual birth weight (Grams) was 2643.00 ± 331.14 (Range 2000-3615). While SFHAG (grams) was 2721.45±360.01 (Range1806 -3534).

Birth weight by SFHAG was overestimated in 58% babies of them 35.5% babies were estimated to have birth weight more than 200 gms. In 42% babies birth weight was underestimated and in 21.5% babies had weight determined less than 200gms.

Discussion

Accurate estimation of fetal weight is vital in the management of labor and delivery. The knowledge of fetal weight in utero helps in the management of diabetic pregnancy, vaginal birth after a previous cesarean section and intrapartum management of fetuses presenting with the breech [11,12].

Furthermore, when dealing with anticipated preterm delivery salvageability of the baby, the intervention undertaken to postpone preterm delivery, optimal mode of delivery or level of a hospital where delivery should occur is based partly on the estimation of expected birth weight. Categorization of fetus into small or large for gestational age can lead to timed obstetric intervention [12-14].

In our study by simple external palpation through anterior abdominal wall i.e. SFHAG in the present study the accuracy of prediction ±100gm/kg was achieved in 26.5% cases. It is comparable with the study by Inler V, et al (1967) [1] who reported accuracy in 27% cases. Ong and sen (1972) [2] reported an error of 54.3% in weight group of ±0 to 8 ounces (240 grams) and out of which error percent was 50% by lecturers which is comparable to our study that shows an error of 43% in weight group of 200gms. Also the present study had 33% accuracy. In present study, the actual birth weight between 2001-2500gms was seen in 36.5% babies. Similar results were seen in study by Bhandary A, Pinto PJ and Shetty AP (2004) [5] having 22.5%

babies in that range. Babies over 3500 grams were observed in 1% of present population while Bhandary A, Pinto PJ and Shetty AP(2004) [5] observed 1.5% babies more than 3500gms.

Conclusion

Equipped with information about the weight of the fetus, the obstetrician managing labour is able to persue sound obstetric management, decreasing perinatal morbidity and mortality. Clinical palpation is a subjective methodology that must be employed at or near the date of delivery, but this method has much errors so should be accompanied with other methods of estimation like USG. Still, clinical methods have importance in developing country like India, where medical resources are often scarce.

References

1. Insler V, Bernstein D, Rikover M, segal T. Estimation of fetal weight in utero by simple external palpation. Am J Obstet Gynaecol 1967; 98(2):292-296.
2. Ong HC, sen DK. Clinical estimation of fetal weight. Am J Obstet Gynaecol. 1972; 112(7):877-885.
3. Campbell S, Wilkin D. Ultrasonic measurement of fetal abdominal circumference in the estimation of fetal weight. Br J Obstet Gynaecol. 1975; 82:689-697.
4. Edouard L, Albarman E. National trends in identified causes of perinatal mortality, 1968-1978. Br J Obstet Gynaecol 1980; 87(10):833-838.
5. bhandary AA, pinto PJ, shetty AP. Comparative study of various methods of fetal weight estimation at term pregnancy. J Obstet Gynaecol Ind, 2004; 54(4): 336-339.
6. Sherman DJ, Arieli S, Tovbin J, siegelG,caspi E, Bukovsky IA comparison of clinical and ultrasonic estimation of fetal weight. J obstet. Gynaecol 1998; 91(2): 212-217.
7. Baum JD, Gussman D, wirth JC 3rd. Clinical and patients estimation of fetal weight vs ultrasound estimation. J Reprod Med, 2002; 47(3):194-198.
8. Titapant V, chawanpaiboon S, Mingmitpatanakul K. comparison of clinical and ultrasound estimation of fetal weight. J Med Assocthai, 2001; 84(9):1251-1257.
9. Dare FO, Adenomowore AS, ifaturoti OO, Nganwuchu A. the value of symphysios fundal height/abdominal girth measurements in predicting fetal weight. Ind J GynaecolObstet, 1990; 31(3): 243-248.
10. EikNes SH, Grottum P, Estimation of fetal weight by ultrasound measurement.I. Development of new formula: ActaobstetGynecscand 1982; 61(4):299-305.
11. Sher man DJ, Arieli S, Tovbin J, Siegel G, Caspi E, Bukovsky I. A comparison of clinical and ultrasonic estimation of fetal weight. ObstetGynecol, 1998; 91:212-7.
12. Chauhan SP, Hendrix NW, Magann EF, Morrison JC, Kenney SP, Devoe LD. Limitations of clinical and sonographic estimates of birth weight: Experience with 1034 parturients. Obstet Gynecol, 1998; 91:72-7.
13. Nzeh DA, Oyawoye O, Adetoro OO. Ultrasound estimation of birth weight in late pregnancy among African women. West Afr J Ultrasound, 2000; 1:9-14.
14. Hendrix NW, Grady CS, Chauhan SP. Clinical versus sonographic estimates of birth weight in term of parturients. A randomized clinical trial. J Reprod Med, 2000; 45:317-22.