## Original Article

# Variation of Clinical Estimation of Foetal Weight: Experience of 247 Cases in Dhaka City

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**Abstract**

**Background:** Foetal weight detection can vary by examining clinically. **Objective:** The purpose of the present study was to see the variation of clinical foetal weight among the newborn infant. **Methodology:** This prospective cohort study was carried out in the Department of Obstetrics & Gynaecology at Rajshahi Medical Hospital, Rajshahi, Bangladesh from July 2012 to June 2014 for a period of 2(two) years. Pregnant women with known gestational age at term (38 to 40 weeks of pregnancy), singleton pregnancy with longitudinal lie were included in this study. The clinical estimation of foetal weight was done. Actual birth weights of babies were measured soon after their birth. This weight was measured within the first hour of life. They were weighed naked. **Result:** A total number of 245 pregnant women in term pregnancy were recruited as per inclusion and exclusion criteria. Majority of the women [91(37.1%)] belonged to the age group 25 to 29 years, 83 (33.9%) in the age group 19 to 24 years. Low Birth Weight was found 14(5.7%) cases in clinical examination and 15(6.0%) cases in actual cases. Normal birth weight was found 215(87.8%) cases and 221(90.3%) cases in clinical examination and actual weight respectively. The mean with SD of foetal weight among the study population were 3283.27±461.05 gm and 2936.20±456.71 gram in clinical examination and actual weight respectively ($p < 0.05$). **Conclusion:** In conclusion there is a significant variation of clinical estimation of foetal weight. *[Journal of Science Foundation 2018;16(2):60-64]*

**Keywords:** Foetal weight; clinical fetal weight; actual weight

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**Introduction**

Appropriate assessment of gestational age is paramount in obstetric care (Zhang et al., 2011). The growth of foetus depends on the nutrients transferred from the mother and on other factors. The birth weight of baby is dependent to a large extent on mother's nutritional status (Johnsen et al., 2006). Thirty Fourth World Health Assembly has recommended that birth weight is one of the twelve global indicators for monitoring health of the community (Mikolajczyk et al., 2011). WHO recommends classification of birth weight depending on the basis of risk of mortality and morbidity of neonates.

New born weight 2500 grams and above is termed as normal birth weight and below 2500 grams is termed as low birth weight; when birth weight less than 1500 grams called very low birth weight (VLBW) and when birth weight greater than 4000 grams called macrosomic baby (Blanc and Wardlaw 2005). Estimation of the foetal weight before delivery by obstetrician or midwife is very important for proper decision making in clinical management (Lunde et al., 2007).

Several parameters such as biparietal diameter (BPD), head circumference (HC), femur length (FL), abdominal circumference (AC) are used for estimation of foetal weight sonographically. Antenatal estimation of foetal weight in uterus is still a challenging affair to an obstetrician (Engle 2006). Estimation of foetal weight can be done clinically by a simple technical method by palpation. Clinical estimation depends on many factors and is more indirect way of measuring the foetal weight. Therefore this present study was undertaken to see the variation of clinical foetal weight among the newborn infant by comparison with the actual weight of the neonate.

**Methodology**

This was an analytic type of single centered prospective cohort study. This study was carried out in the Department of Obstetrics & Gynaecology at Rajshahi Medical Hospital, Rajshahi, Rajshahi, Bangladesh from July 2012 to June 2014 for a period of 2(two) years. This study was carried on the pregnant women attending IPD and OPD in the Department of Obstetrics & Gynaecology at Rajshahi Medical Hospital, Rajshahi, Bangladesh. Pregnant women with known gestational age at term (38 to 40 weeks of pregnancy), singleton pregnancy with longitudinal lie were included in this study. Malpresentation, multiple pregnancy, dead fetus, congenital malformation of fetus, patient having gestational diabetes mellitus (GDM) or chronic hypertension, pre-eclampsia (PE) and eclampsia, patient with history of premature rupture of membrane (PROM), antepartum haemorrhage (APH) were excluded from this study. Purposive sampling technique was applied to select the study subjects for the present research. Women were included in this study on the basis of their fulfillments of the inclusion criteria. Obtaining the inform consent, a proper history was taken from the patient and a clinical examination was done. All information was collected in a pre-designed data sheet. The clinical estimation of foetal weight was done. Foetal weight was estimated by using Johnson's formula. The women were asked to empty their bladder. They were then advised to lying down in supine position. Symphysis fundal height was measured with the use of non-stretchable tape marked in centimetres. The measurement was taken from the superior rim of the pubic bone in the midline to the top of the uterine fundus.  Actual birth weights of babies were measured soon after their birth. This weight was measured within the first hour of life. They were weighed naked.  The data were analyzed with the help of SPSS program. Paired "t" test and "Correlation coefficient" test performed to determine the difference among various types of measurement of foetal weight. The relationship of actual birth weight with clinical and ultrasonographic estimated weights were determined separately by using correlation coefficient test. For statistical significance *p* value was taken ≤0.05. Permission was taken from the Ethical Review Committee (ERC) of the Rajshahi Medical College, Rajshahi before conducting the research. Informed written consent was taken from each study subjects before history taking and clinical examination.

**Results**

A total number of 245 pregnant women in term pregnancy were recruited as per inclusion and exclusion criteria. Majority of the women [91(37.1%)] belonged to the age group 25 to 29 years, 83 (33.9%) in the age group 19 to 24 years, 19.6% in the age group  30 to 34 yrs and 9.4% in the age group 35 to 39 years (Table 1).

**Table 1:  Age distribution of the Study Subjects**

| Age groups | Frequency | Percentage |
|---|---|---|
| 19 – 24 yrs | 83 | 33.9 |
| 25 – 29 yrs | 91 | 37.1 |
| 30 – 34 yrs | 48 | 19.6 |
| 35 – 39 yrs | 23 | 9.4 |
| **Total** | **245** | **100.0** |

Low Birth Weight was found 14(5.7%) cases in clinical examination and 15(6.0%) cases in actual cases. Normal Birth Weight was found 215(87.8%) cases in clinical examination and 221(90.3%) cases in actual cases. Overweight was found 16(6.5%) cases in clinical examination and 9(3.7%) cases in actual cases (Table 2).

**Table 2: Relationship between Clinical Foetal weight and Actual Birth weight**

| Weight (gms) | Clinical FW | Actual BW | P value |
|---|---|---|---|
| Low Birth Weight | 14(5.7%) | 15(6.0%) | |
| Normal Birth Weight | 215(87.8%) | 221(90.3%) | 0.001 |
| Overweight | 16(6.5%) | 9(3.7%) | |
| **Total** | **245**(100.0%) | **245**(100.0%) | |

Low Birth Weight=≤2499; Normal Birth Weight=2500-3999; Overweight=≥4000

Table 3 shows the mean with SD of foetal weight among the study population were 3283.27±461.05 gm and 2936.20±456.71 gm in clinical examination and actual weight respectively. The results of paired 't' test showed that the difference between Clinical estimation of foetal weight and actual birth weight was statistically significant ('$t$'= 16.54, $df$ = 244, $p < 0.05$).

**Table 3: Difference of Mean between Clinical foetal weight and Actual Birth Weight**

| Weight | Mean±SD | P value |
|---|---|---|
| Clinical Foetal Weight | 3283.27±461.05 | <0.05 |
| Actual Birth Weight | 2936.20±456.71 | |

**Discussion**

In current obstetric practices, a management protocols for certain situations have included an estimation of foetal weight in decision-making (Jong et al., 1998). The present study was a cross-sectional comparative study carried out in the department of Obstetrics and Gynecology of Rajshahi Medical College Hospital from July 2012 to June 2014. A total of 245 women with singleton pregnancy and longitudinal lie at 38-40 weeks of gestation were studied. Majority of the women [91(37.1%)] belonged to the age group 25 to 29 years, 83 (33.9%) in the age group 19 to 24 years, 19.6% in the age group  30 to 34 yrs and 9.4% in the age group 35 to 39 years.

Low Birth Weight was found 14(5.7%) cases in clinical examination and 15(6.0%) cases in actual cases. Normal Birth Weight was found 215(87.8%) cases in clinical examination and 221(90.3%) cases in actual cases. Overweight was found 16(6.5%) cases in clinical examination and 9(3.7%) cases in actual cases. Shamley and London (2004) noted that the error of clinical estimation was statistically higher than that for ultrasonographic estimation by the Hadlock et al (2004) and Shepard et al (2002) formulas. These results were similar to other two studies performed by Sabbagha et al (2009) and Rose and McCallum (1987). Patterson et al (2005) also noted that clinical estimation was less accurate than ultrasonographic estimation by Compbell formula but was comparable to the Warsof et al (1997) formula for ultrasonographic estimation. Both formulas were more accurate than clinical estimation in the presence of oligohydramnios or engagement of the foetal head. The mean with SD of foetal weight among the study population were 3283.27±461.05 gm and 2936.20±456.71 gm in clinical examination and actual weight respectively. The

results of paired 't' test showed that the difference between Clinical estimation of foetal weight and actual birth weight was statistically significant ($p < 0.05$).

The results of paired 't' test showed that the difference between Clinical estimation of foetal weight and Actual birth weight was statistically significant ('$t$'= 16.54, $df$ = 244, $p$ = <0.05). Sherman et al (2008) showed that birth weight ranges between 2500-4000 Gms were detected more accurately by clinical method than ultrasonography but it differs from me. In present study only 34% of clinical estimate were within 10% error of actual birth weight. Sherman et al (2008) showed that somewhat lower accuracy of sonographic estimation was due to foetal weight within one week prior to delivery. They also reported that both clinical and ultrasonic estimation generally underestimates the weight of the macrosomic foetus and there was a tendency toward overestimation in cases of low birth weight. A large study by Benacerraf et al (1988) demonstrated that 74% of the ultrasonographic estimation of foetal weight was within 10% of the actual birth weight. This is a more or less correlated with present study.

## Conclusion

In conclusion clinical estimation of foetal weight is significantly varied. Estimation of weight in both methods used separate and independent formula.

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