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Parturient Symphysis-fundal Height Measurement of Nigerian Pregnant Women: A Predictor of Birth Weight

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ABSTRACT

Although birth is the culmination of months of prenatal development. Classification of growth for a particular gestational age is a critical part of fetal and infant care. References used at different centers are not always comparable, some are many years old and few have used rounding off to the nearest completed week of gestation as recommended by WHO. The objective of this study is to derive a chart for estimating birth weight from symphysis fundal height (SFH) measurement at labour; and to determine a useful SFH cut off value for prediction of birth weight 4.000grams using prospective SFH in 202 Nigerian pregnant women in Uromi, Edo state. Nigeria. An estimated birth weight chart using SFH at labour was derived in which we observed that birth weight increases with increase SFH at labour; and that a value of 30cm and below predicts a high probability of low birth weight . This chart is presented for intra-partum use in term pregnancies.

Key words: Birth Weight, Fundal Height, Labour.

Symphysis fundal height (SFH) measurement is the distance in centimetres from the upper border of the symphysis pubis to the rounded upper border of the uterine fundus. (Decherney & Nathan 2003) it has been described as an objective method in evaluating foetal growth in pregnancy (Ogunranti 1990). It is measured as part of the antenatal care at the antenatal clinic which is the outpatient clinic for pregnant women designed to classify risk, risk defects and treat any abnormalities or complications at the earliest possible time in order to maintain the physiology of pregnancy and answer the womans questions (Agboola 1988, lewis and chamberlain 1990).

The birth weight of neonates is an anthropometric feature ranging from place to place. The birth weight is an important anatomic characteristics of a given population(Ebite *et al,* 2005). Several methods of fetal weight estimation are currently in use. Among them ultrasound provides reliable data but is not easily accessible in most developing countries. There is a good correlation between SFH and birth weights (Bothner *et al* 2000) when reported measurements in individual pregnancy is plotted. Such an approach reveals variation which can occur due to under nourishment, obesity and IUGR. (Agerwal *et al* 2002). Especially with the use of the growth velocity chart. (Ebite *et al* 2009) The value of repeated SFH measurements have been considered to have a moderate power to predict birth weights (Kulmala *et al* 2001). At 28 weeks of gestation birth weight in different SFH values were given

as follows (Hughes *et al* 1987) >30cm =3770+450g ; 27-30cm= 3410+390g ;24-27cm = 3170+400g; <24cm =2730+440g

Whereas the SFH values in multiple pregnancies are definitely higher than in normal pregnancies (Yokoyama 2002, Rouse *et al* 1993) serial SFH measurements in singleton pregnancies are not reliable in prediction of foetal macrosomia (Kraeim *et al* 2004). SFH measurement at early labour has been randomly investigated and studies yield difference which varies between regions. The average value obtained in the United Kingdom is about 38cm (Mongelli and Gardosi 1999). The average SFH at 40 weeks in UBTH Benin Nigeria is 37.9cm which is comparable with the U.K value but varies significantly from the values obtained at Tanzania and India 35.6cm and 33.5cm respectively (Gharoro 2002, Walraven *et al* 1995, Mathai *et al* 1987). These differences when related to birth weight have critical cut off points for low birth weight. In Varanasi India, the critical limit obtained for the prediction of low birth weight is 31cm (Mohanly *et al* 1998). This correlates with the value obtained in Canada (Labreqre & Bouliana 1987) (Walraven *et al* 1995) working in Tanzania derived a cut off limit of 30cm having a detection rate of 66-68%. The normal range of SFH at term in Iran was reported as 27-35cm (Fatemeh *et al* 2002) with high risk delivery expectable when the value is outside this range The SFH at 40 weeks/early labour represents the final point in an anthropometric continuum which represents the foetal growth rate.

The aim of this study is to relate SFH at labour and birth weight and get a value for the lower and highest limit of normal for the region studied.

MATERIAL AND METHODS

This study was done at the Saint Camillus Hospital, Uromi, a Catholic mission hospital established in 1948. It is a major hospital in Edo Central district and has 200 inpatient beds. Clinical assessment of pregnant women is done by general medical practitioners assisted by midwives. Uromi is a major town in Edo State and the headquarters of Esan North-east Local Government Area. It has an estimated population of 100,000 (Microsoft Encarta 2004). The indigenous tribe is Esan with a sprinkling of settlers from other tribes like Bini, Ibo, Hausa, Igbira and Yoruba. Most of the population are farmers and traders. The study population consisted of 202 booked pregnant women. Only women who were sure of their last menstrual period were recruited for the study. Women who were on hormonal contraception within 3 months of conception, were breast-feeding when they became pregnant or had irregular cycles prior to conception were excluded from the study, except where a first

trimester ultrasound scan for dating had been done. Women with multiple pregnancy were also excluded. This is a prospective study. Approval was obtained from the Medical Ethics committee of the Delta State University, Abraka and the management of St Camillus hospital before commencing the study. Also, the study was carefully explained to the patients and their consent obtained before recruitment into the study. Using a non elastic tape, the symphysiofundal height measurement was taken in standard condition from the top of the uterine fundus to the upper part of the symphysis pubis; Standard condition refer to supine position *empty* bladder and relaxed abdomen: at each antenatal clinic visit from 20 weeks' gestation and at labour. The study is part of a larger study to produce a SFH percentile chart and derive a growth velocity chart for Uromi women. Statistical analysis of data used Microsoft package 2001.

RESULTS

Figure 1 presents the relationship of symphysis - fundal hieght at labour and birth weight from SFH =28cm. The figure shows a linear relationship between SFH at labour and birth weight**.** It is also indicative of the fact that SFH 30cm increases the chances of birthing an infant with l**o**w birth weight.

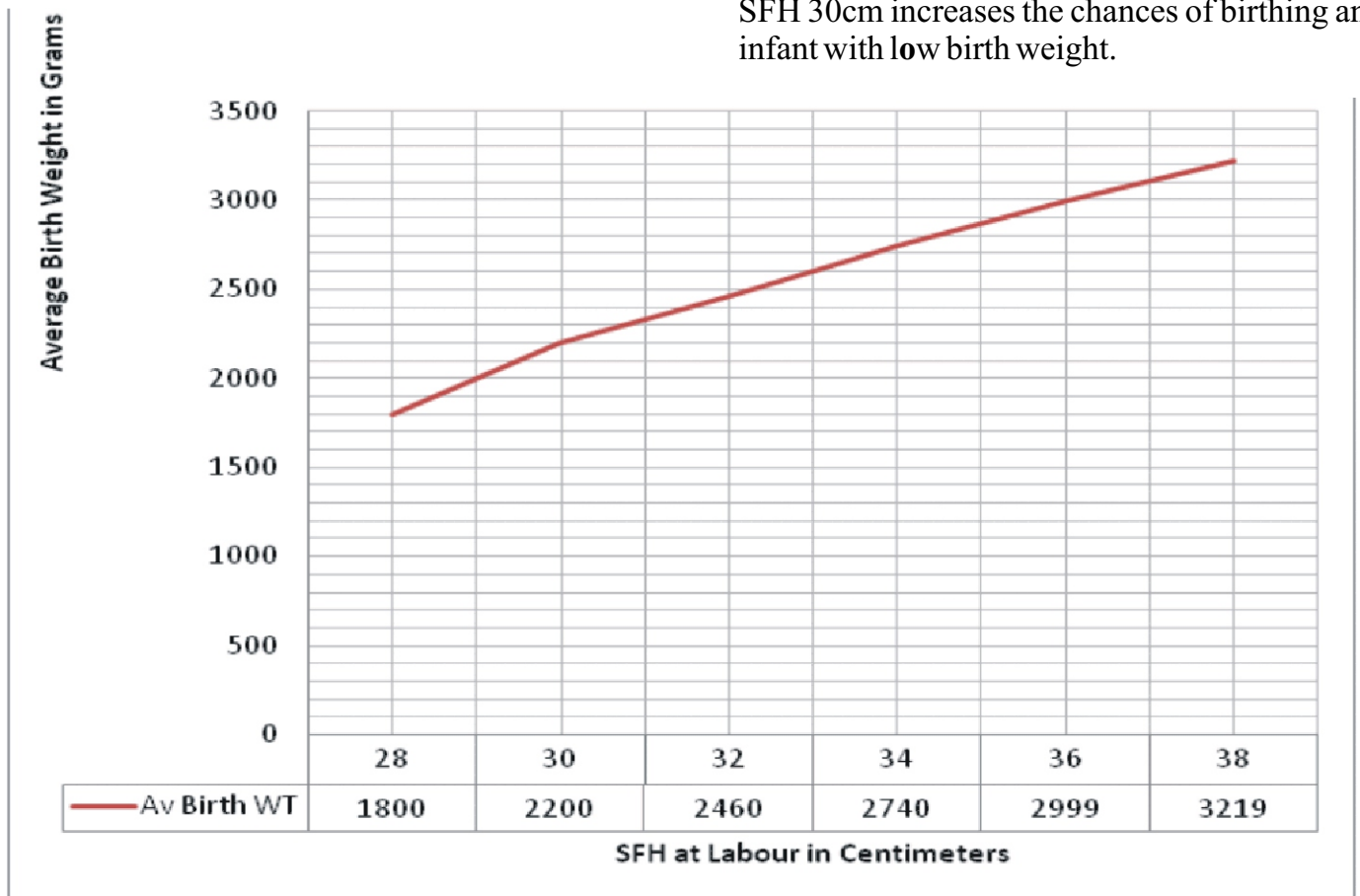|	28	30	32	34	36	38
Av Birth WT	1800	2200	2460	2740	2999	3219

SFH at Labour in Centimeters

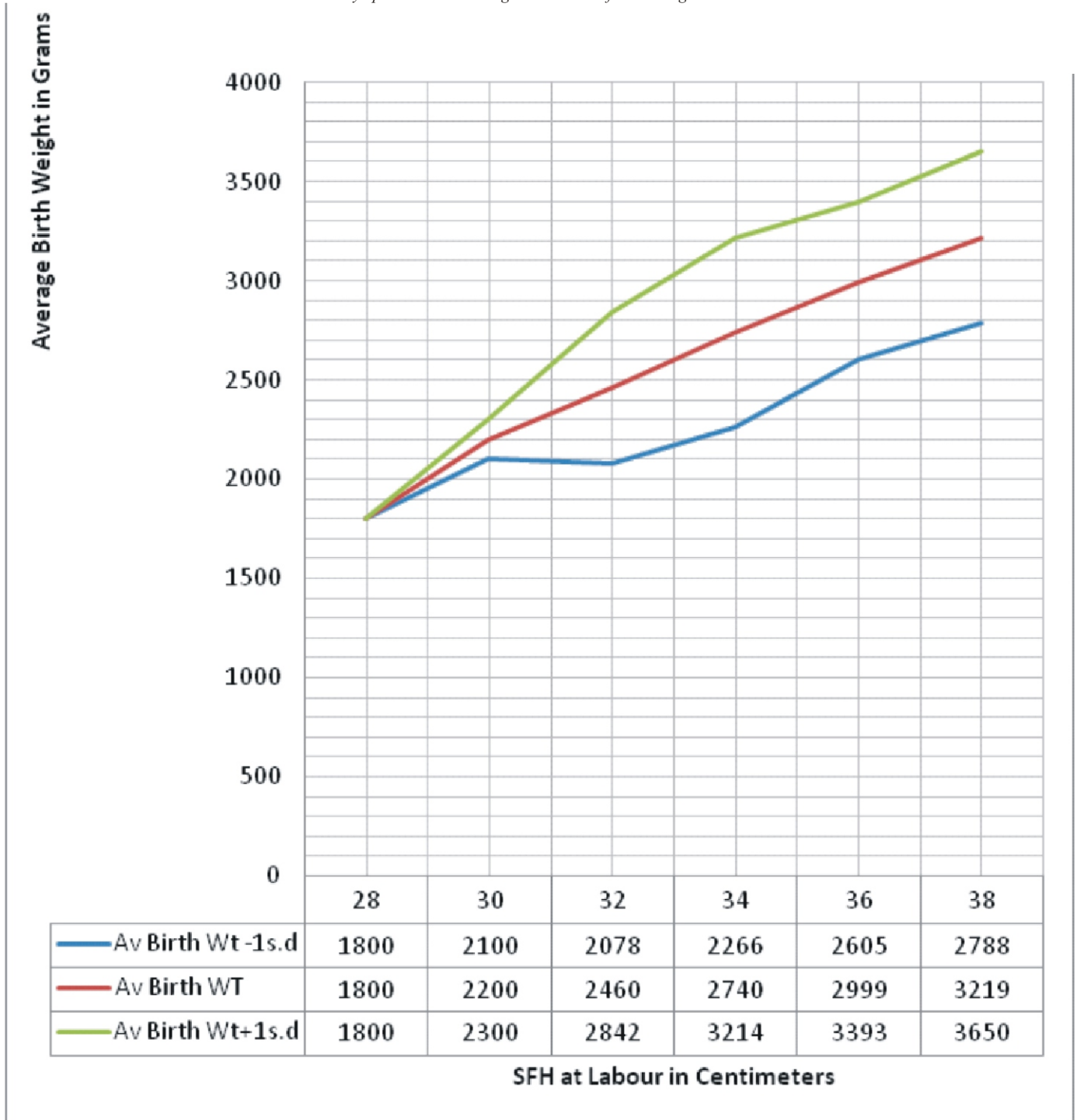Fig. 1 Average Borth Weight +/-1s.d and SFH at Labour

Fig. 2: Average Birth Weight +/- 1s.d and SFH at Labour

DISCUSSION

A total of 202 parturient women took part in the study they were mostly Esan origin (97%) while Ibos comprised 1.5% Hausa 1.0 and Igbira 0.5%.

This study derived an estimated birth weight chart using parturient SFH; in which we observed that birth weight increases with increase SFH in labour, we also observed that parturient SFH of 30-35 cm is associated with delivery of babies with birth weight 2.5-4.0kg. parturient SFH below 30cm was associated with low birth weight babies 2.5kg (small for gestational age), The use of parturient SFH measurement obtained in early labour for prediction of birth weight has been severally studied and noted that when measured at early labour SFH values vary with regions; with different regions having different ranges or absolute cut off points of SFH at which a low birth weight outcome is expected. For instance, SFH for Iran 27-35cm (Fatemeh *et al* 2002), India 28-31cm (Mohanty *et al* 1998), Enugu, Nigeria 33cm(Onah *et al* 2002) and U.K 32cm . The result of our study was lower than that obtained in the UK and Enugu and higher than

that of Iran and India. The observations above suggest that environment and probably economic status more than race influences SFH at labour which in turn affects the birth weight. The findings suggest that the index for suspicion of a low birth weight infant should be higher for pregnant women in labour whose SFH falls within 30-35cm making interventive measures faster e.g referral to a secondary health facility where adequate care can be given to a low birth weight infant. More especially most of the deliveries of women in this region are taken by nurses in maternity homes. More studies are needed to confirm the predictive ability of this curve.

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