

Ethnic Differences in Birth Weight and Cesarean Deliveries in Port Harcourt, Nigeria

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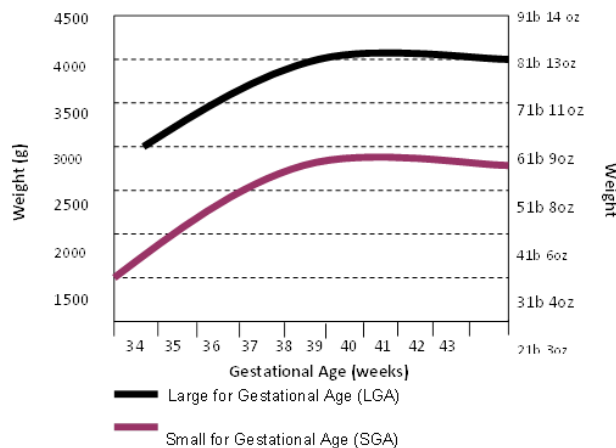
Abstract: This study seeks to investigate the existence of ethnic differences in birth weight and cesarean deliveries amongst the ethnic groups in Port Harcourt, Nigeria. The study was a retrospective review research. University of Port Harcourt teaching Hospital, Port Harcourt between 2003 and August 2008. The study was a retrospective review research involving a dataset of 1287 (Ibo n = 241, Ikwerre n = 316, Kalabari n = 322, Ogoni n = 200 and Yoruba n = 208) culled from over 3560 live singleton births maternity records covering deliveries for five years (2003 - 2008) at the University of Port Harcourt Teaching Hospital; Port Harcourt, Nigeria. The data obtained were analyzed using SPSS statistics software 2008 and the level of significance used was $P < 0.05$. Student T- test, One-way analysis of variances, Correlation analysis and Pearson chi square. There are significant differences $P < 0.001$ in the mean birth weights of the five ethnic groups. The prevalence of cesarean deliveries among the ethnic group was significantly associated with the Ibo ethnic group (Ibo 12.45%, Ikwerre 11.07%, Kalabari 9.94%, Ogoni 7.50% and Yoruba 6.73%: $X^2 = 12.25$, $df = 2$, $P = 0.003$). The study revealed that the Ibo ethnic group has higher birth weight which may be the predisposing factor to higher percentage of Cesarean deliveries.

Keywords: Birth weight, Ibo, Ikwerre, Kalabari, Ogoni, Yoruba.

INTRODUCTION

The study of birth weight is essential in the measurement of prenatal growth. It has been used by clinicians and public health workers as an indication of viability for the new born [1]. Birth weight is the weight of a baby at birth. It has direct links with gestational age at which the child was born and can be estimated during pregnancy by measuring the fundal height. Birth weight and gestational age are related, as birth weight is classified with gestational age.

BIRTH WEIGHT AND GESTATIONAL AGE



CLASSIFICATIONS

- Large for gestational age: Weight is above the 90th percentile at gestational age.
- Macrosomia: Weight is above a defined limit at any gestational age
- Appropriate for gestational age: Normal birth weight
- Small for gestational age: Weight is below the 10th percentile at gestational age
- Low birth weight: Weight is below a defined limit at any gestational age [14].

Numerous biological traits including birth weight have shown significant differences with respect to ethnicity. Birth weight has been found to express genetic and ethnic differences [2-6].

Several studies have established significant differences in white Americans and African-Americans [7], a risk of lower birth weight in African Americans [8]. Differences in birth weights have been reported among Europeans, Asians and African- Caribbean [9].

Incidence of cesarean deliveries has increased in recent years [10,11]. This mode of delivery has been associated with increased fetal and maternal mortality [10, 12]. The term cesarean delivery is defined as the delivery of a foetus through a surgical incision through the abdominal wall (laparotomy) and uterine wall (hysterotomy). A cesarean delivery is performed for many reasons. Therefore, trying to present a single situation (clinical) is extremely difficult and limiting, it can be stated that cesarean deliveries are often associated with increase birth weight [13]. Earlier studies has shown that increased birth weight is not only the cause of cesarean deliveries, low expression of gene that are connected with myometrial contractions has been implicated for failure of parturition to take place [14, 15]. Low and high birth weight have been reported to exert an integral risk of cesarean deliveries in nulliparous non-Hispanic white women [16]. Excessive weight gain during pregnancy which shows

significant correlation with high birth weight is an independent risk factor for cesarean birth [17]. This study seeks to investigate the existence of ethnic differences in birth weight and cesarean deliveries amongst the ethnic groups in Port Harcourt.

MATERIALS AND METHODS

The study is a retrospective review based on a data set of over 3560 singleton births, which took place at the department of obstetrics and Gynecology, University of Port Harcourt teaching Hospital, Port Harcourt between 2003 and August 2008. For the purpose of this study 1287 material records were extracted from the delivery register for further investigation. This is on the facts that they can be identified on the basis of their ethnic group. Parameters for mothers which were used for the study includes maternal age, ethnic group, parity, frequency of cesarean delivery. The parameters taken for the newborn were sex and birth weight of the newborn.

Data were expressed as mean ± standard deviation (SD) student T- test was used to test for differences in the means of the birth weight in male and female newborn, for each of the ethnic groups. One-way analysis of variances was used to test for significant difference between birth weights in the various maternal ethnic groups, maternal age and parity. Correlation analysis was used to examine the relationship between birth weight and maternal age and parity. Pearson chi square was used to check significant association in prevalence of cesarean deliveries among the maternal ethnic groups all analysis was done using the SPSS. Data analysis software the level of significance used was $P < 0.05$.

RESULTS AND DISCUSSION

In table 1 differences in birth weight of the newborns according to sex showed significant difference at $P < 0.001$ in males and $P = .05$ in females.

Table-1: Birth weight (Kg) of Newborns according to sex analyzed with one way analysis of variance and students t-test

	Ibo	Ikwerre	Kalabari	Ogoni	Yoruba	P
Males	3.30 ± 0.52 ^a n = 119	3.26 ± 0.53 ^a n = 200	3.31 ± 0.53 ^a n = 146	3.02 ± 0.53 ^a n = 102	3.11 ± 0.45 ^a n = 105	< 0.001
Females	3.04 ± 0.57 ^a n = 1,22	3.00 ± 0.52 ^a n = 116	3.01 ± 0.52 ^a n = 176	2.96 ± 0.57 ^a n = 88	3.03 ± 0.5 ^a n = 103	< 0.05
T	4.16	4.16	3.15	1.93	1.89	
P	< 0.001	< 0.001	0.004	0.05	0.06	

Key: Means with similar superscripts are the same while means with different superscripts are significantly different.

In table 2 the Ibos had the highest mean in maternal age, while the Ogonis had the lowest, and also

the highest parity with statistically significant differences at $P < 0.001$.

Table-2: Maternal age, birthweight and parity according to Ethnic group

	N	Mean \pm SD	Range	P
Maternal Age				
Ibo	241	28.45 \pm 5.393	18-40	<0.001
Ikwerre	316	27.25 \pm 5.26 ^b	17-40	
Kalabari	322	26.11 \pm 6.16 ^c	17-45	
Ogoni	200	26.18 \pm 6.33 ^c	17-40	
Yoruba	208	27.85 \pm 5.26 ^b	17-45	
Birth weight (Kg)				
Ibo	241	3.21 \pm 0.63 ^a	2.00 – 4.45	< 0.001
Ikwerre	316	3.19 \pm 0.60 ^a	2.00 – 4.30	
Kalabari	322	3.19 \pm 0.59 ^b	1.90 – 4.50	
Ogoni	200	3.11 \pm 0.53 ^c	1.80 – 4.00	
Yoruba	208	3.10 \pm 0.52 ^c	1.50 – 4.75	
Parity				
Ibo	214	3.01 \pm 1.90 ^a	1- 9	< 0.001
Ikwerre	316	3.01 \pm 1.88 ^a	1-8	
Kalabari	322	3.00 \pm 2.44 ^b	1 -8	
Ogoni	200	3.39 \pm 2.48 ^b	1.11	
Yoruba	208	2.66 \pm 1.83 ^c	1- 10	

Key: Means with similar superscripts are the same while means with different superscripts are significantly different.

In Table 3 using correlation analysis indicated significant relationship between maternal age and birth weight at $P < 0.01$. It was observed that birth weight and parity fails to reach significant relationship. Pearson

chi-square analysis indicate that there's significance associated in the prevalence of cesarean delivery and maternal ethnic group $P = .003$

Table-3: Correlation Matrix of maternal age, parity and birth weight (N = 1287)

	Maternal age	Parity	Birthweight
Maternal age	—	0.73	0.21
Parity		$P < 0.001$	$P < 0.001$
Birthweight		—	0.03
			$P < 0.23$

DISCUSSION

High maternal age is an evident feature in the maternal parameters. It has been reported to be associated precisely with the Ibo ethnic group [18]. There's a marked difference in Mean of maternal age between the Ibo mothers and the Kalabari Mothers. The difference is 2.34 years. This result shows that the Ibos marry later than the Kalabaris, Ogoni and Yoruba mothers. In the course of the study, it was observed that though the Kalabaris and Ogonis marry early, there were many cases of teenage mother seen, and observed to give birth to Macrosomic infants and suffered complications as cephalopelvic disproportion and breech presentation of the foetus this somehow made many of the teenage mothers undergo cesarean delivery. These findings agree with a similar study [19, 20], where teenage mothers were seen to exhibit adverse reproductive outcomes. The Ogoni mothers showed the highest parity, and it was also observed that they had relatively low maternal age. It thus agrees that

low maternal age may aid high parity as it was seen in a similar study [18], that the maternal ethnic group with the lowest maternal age had the highest parity. This finding agrees with reports in other populations where higher maternal age has been associated with higher newborn birth weight and other somatometrics and adolescent mothers with poor birth outcomes [21-25].

The Ethnic difference observed did not stop at the cumulative effect of both sexes of newborns, but was also expressed even when the newborns were separated into their respective sexes. The Igbo newborns were significantly higher both in the males and females at $P < 0.001$ and $P < 0.05$ respectively. This is followed closely by the Ikwerre mothers showing close values as the Igbo mothers at the same value of P. This may owe to the fact that Ikwerres were believed to be a descent from the Igbo ethnic group and have probably carried the traits associated with this feature (high birth weight) probably due to high

maternal age. These values when compared with the Ogonis and Yoruba mothers are relatively high. The effect of sex is not strong when considering the Ogonis, Yorubas and Kalabaris. It was however noted that male newborns are heavier than the females, the difference proved to be just marginal ($P = 0.05$ and $P = 0.06$, respectively). The prevalence of Cesarean Deliveries are highly associated with higher birth weights [24, 25]. The results of this study also agree with these reports. The higher prevalence of Cesarean Deliveries in the Igbo and Ikwerre may be associated with maternal age of the Igbo/Ikwerre mothers. However, higher birth weight cannot be implicated as the only cause of Cesarean deliveries [14].

CONCLUSION

This study revealed a strong evidence of the difference between birth weights in the ethnic groups studied. One of the factors that may be the reason for this variation is the difference also observed in the maternal age of the studied population. The reason(s) for the variation in maternal age amongst the ethnic groups studied is not clear.

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COMPETING INTERESTS

We write to state that there is no conflict of interest.

AUTHORS' CONTRIBUTIONS

'Author A' (Paul, Chikwuogwo Wokpeogu) designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. 'Author B' (Adefisan, Idowu Elijah) and 'Author C' (Paul, John Nwolim) managed the analyses of the study, managed the literature searches. All authors read and approved the final manuscript.

ETHICAL APPROVAL

Ethical clearance was obtained from the university of Port Harcourt ethics committee before commencement of the study.

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