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BIRTH WEIGHTS OF FULL TERM NEWBORN BABIES AMONG THE IGBOS OF EASTERN NIGERIA

G. N. Adimora, N. K. Chukwudi, O. Ejike.
Department of Peadiatrics, University of Nigeria Teaching Hospital, Enugu-Nigeria.

ABSTRACT

Aims and Objectives: The birth weights of full term newborn infants have not been studied in the Igbo ethnic area of Eastern Nigeria. This study is aimed at establishing reference figures for this part of the country.

Materials and Methods: A five-year (1991 - 1996) retrospective, multicenter study of birth weights of full term newborn infants was carried out in four hospital located in four different states in Eastern Nigeria. All the states were in the Igbo ethnic area of the country. The hospitals included the University of Nigeria Teaching Hospital, Enugu, St. Charles Borromeo Hospital, Onitsha, Mater Misaeri Cordiae Hospital, Afikpo and Federal Medical Centre, Umuahia. A total number of 20,805 babies was enrolled in the study, made up of 10,618 males and 10,187 females.

Results: The mean birth weight of all the full term babies was 3.17(+/-0.074)kg, the difference was not statistically significant ($p > 0.05$). The 3rd centile was 2.0004, 50th centile 3.2253 and 97th centile 4.1505. The Low Birth Weight rate was 9.533%.

Conclusion: The mean birth weight of full term newborn infants in the Igbo ethnic area of Eastern Nigeria is 3.17kg.

KEY WORDS: Birth weight, Full term babies, Eastern Nigeria

INTRODUCTION

The birth weight of a newborn infant is the most important indicator of maturity of the neonate and health status of the mother. It is also an important determinant of perinatal mortality. It is influenced by various factors including maternal, environmental and genetic factors.[1] Authors in the past had observed that the birth weights of the African newborn were much less than those of their West European and North American counterparts.[2] This was ascribed to the state of nutrition of the mother, maternal illness and other environmental factors.[2,3]

Generally speaking, low birth weight (less than 2.5kg), increases perinatal mortality for reasons ranging from prematurity to placental insufficiency.[4] On the other hand, macrosomia or high birth weights (more than 4.0kg), leads to obstetric complications arising from difficult delivery, and subsequent birth trauma including birth asphyxia.[5] It is therefore necessary to know the normal birth weight range in any geographical area so that these problems can be anticipated.

A number of authors have written on birth weights in Nigeria, but these have been mainly from the Western and Northern parts of the country.[1,6,7,8] Figures obtained have varied from one area to the other. This may be an indication that birth weights may vary from one ethnic group to the other, and Nigeria has more than 250 different ethnic groups. It is therefore necessary to know the figures from the area studied since this may not necessarily be the same as for the other parts of the country.

Correspondence: Dr. G. N. Adimora.

MATERIALS AND METHODS

Birth records from four major hospitals in four out of fivestates in the Igbo ethnic area of Eastern Nigeria were studied retrospectively for periods ranging from five to seven years. The hospitals included, (1) The University Of Nigeria Teaching Hospital, (UNTH), located in Enugu, Enugu State; January 1992-December 1996. This is a major referral centre for other hospitals in the Eastern part of Nigeria. (2) Mater Misaeri Cordiae Hospital Afikpo, (MMH), (January 1990-December 1996), is a mission hospital located in Ebonyi State which has for some decades been providing health care to a rural population made up mainly of farmers. It is staffed by a specialist obstetrician and a few other medical officers (3) Federal Medical Centre Umuahia, Abia State; (FMCU), (January 1991 - December 1995), a government-run secondary medical centre located in a state capital. (4) St Charles Borromeo Hospital, Onitsha. Anambra State, (SCBH), (January 1992 - December 1995), a mission hospital located in a commercial city. It has a specialist obstetrician in its staffing and also some more junior medical officers. Apart from MMH, which is located in a rural area, the other three hospitals are in urban areas. None of the locations has an altitude exceeding 400ft (121.92m), above sea level.

Birth weights of babies were collated from the birth records of the different hospitals excluding all babies that were pre-term (less than 37 completed weeks gestation at birth). The gestational ages were mainly obtained by estimations form the mothers' last menstrual period except for the UNTH where the staff were trained to make estimations using the Dubowitz charts.[10] The *Waymaster* weighing scale was found to be in use in all the hospitals. The mothers' ages, weights, heights, social status and the birth order of the babies were not put into consideration, as these data were not fully available in all the hospitals. Babies of multiple pregnancies were not

excluded from the study so far as they were term deliveries, their weights being entered individually. Some of the years' records in the different institutions had to be excluded where they were either missing or mutilated. Since this is a retrospective study, we had to rely on the weights as obtained from the birth records of each of the hospitals. The weights obtained were then analysed for each of the centres using the EXCEL format.

RESULTS:

A total of 20,805 babies were involved in the study. Out of this number, 3737 babies were from the FMC Umuahia, 7392 from MMH Afikpo, 4968 were from SCBH Onitsha and 4708 from UNTH Enugu. (TABLE 1). The average number of births per year (delivery rate), ranged from 747 for FMC to 1056/year for MMH. The blank areas in the table indicate some of the years in which the birth records could not be obtained. Only MMH had records spanning seven years consecutively, while the rest of the other centres had complete records for five years only. In two of the centres, a low number of births was recorded, 294 for FMC in the year 1994 for reasons not very clear, but most likely due to poor record keeping. In the UNTH, the low figure of 207 for the same year 1994 was due to an industrial action that paralysed hospital services for several months.

TABLE II shows the total number of male and female babies involved in the study. There was a total of 10.618 male babies (51.035%), and 10,187(48.964%) females giving a male/female ratio of 1:0.959.

The table also shows the general mean birth weight of 3.174kg. The male mean birth weight was 3.304kg, while the female mean birth weight was 3.1080kg. There was no statistical difference between the birth weights of the male and female subjects ($p>0.5$). It can also be seen that mean birth weight of the male babies in the urban areas was 3.2693kg, while the mean birth weight for the males in the rural centre was 3.115kg. There was no statistical difference between the two: ($p> 0.5$); Similarly there was no statistically different finding between the weights of the urban female subjects (3.138kg) and their rural counterparts (3.0160kg) $p>0.5$.

TABLE III shows the Low birth weight rates in the different hospitals, which ranged from 6.62% for SCBH to 11.4% for MMCH. However the mean low birth weight rate was 9.53%. It is noted that the highest low birth weight rate was recorded in the rural hospital.

In TABLE IV is shown the percentile distribution of the 20,805 babies involved in the study. As seen in the Table the 3rd Centile was 2.0004; 50th centile 3.2253 and 97th Centile 4.1505kg.

Table 1: **Number Of Births Per Hospital**

	HOSPITAL			
YEAR	FMC	MMH	SCBH	UNTH
1990	-	975	-	-
1991	830	1296	864	-
1992	1028	1606	965	1543
1993	693	1328	1028	860
1994	294	865	1015	207
1995	892	715	1096	1310
1996	-	607	-	788
TOTALS	**3737** (747.4/YR)	**7392** (1056/YR)	**4968** (993.6/YR)	**4708** (941.6YR)

GROSS TOTAL = 20,805

Table II: **Sex Distribution Of Mean Birth Weights**

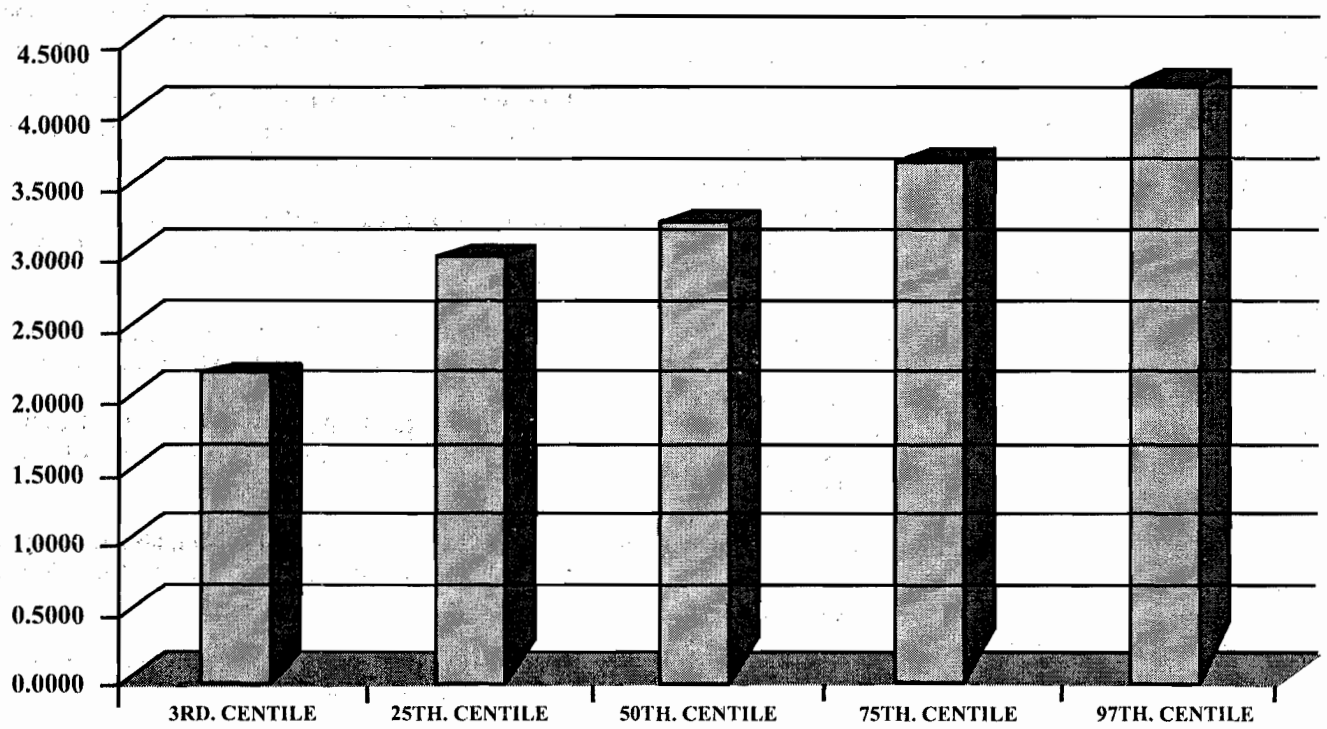
	FMC	MMH	SCBH	UNTH	TOTALS/MEAN
TOTAL NO MALES	1713	3907	2591	2407	10,618(51.035%)
TOTAL NO FEMALES	2024	3485	2377	2301	10,187(48.964%)
MEAN BT/WT	3.113	3.068	3.272	3.304	3.2307
MEAN BT/WT (M)	3.152	3.115	3.352	3.304	3.2307
MEAN BT/WT (F)	3.082	3.016	3.183	3.151	3.1080
MEAN DIFFERENCE	0.070	0.096	0.166	0.153	0.1212

(P>0.05)
URBAN MEAN: MALES = 3.2693 FEMALES = 3.138
RURAL MEAN: MALES = 3.115 FEMALES = 3.0160.
(P>0.05) (P>0.05)

Table III: **Low Birth Weight Rates At The Study Sites**

	FMC	MMCH	SCBH	UNTH	TOTALS
MALES	158	389	121	198	866(8.15%)
FEMALES	204	453	151	227	1125(11.04%)
TOTALS	369(9.6%)	842(11.39%)	272(6.62%)	425(9.02%)	1991(9.53%)

Table IV: **Percentiles For Birth Weights**



DISCUSSION

In this study, as in some others done previously, there were more male babies (10,618 or 51.035%), than females (10,187 or 48.964%) in all the hospitals[1,2,8]. [TABLE II). This difference is however not statistically significant ($p>0.05$). The mean birth weight for boys is also higher than that of the girls in all the centres as seen in Table II, but again this is not statistically significant ($p>0.05$) In all the other studies earlier cited, the male mean birth weights were also higher than the female mean birth weights. The mean difference between the male and female full term babies in this study was 121.2gm. Hytten and Leitch had estimated this to be 150mg in their study in 1971.[11] When the mean birth weights are compared with other findings in other parts of the world and also other parts of the country, significant differences have been documented ranging from 2.88kg to 3.1kg. For example, figures from Ibadan (Western Nigeria) give a mean birth weight of 2.9kg[8], Southern Zaria (North Central Nigeria) 2.88kg[9]; Malumfashi, (North Central Nigeria)2.892kg[1]; Tanzania, 2.94kg[2]; USA Caucasians, 3.29kg[12], USA Blacks, 3.103kg[12], Indian 2:946kg, Malay, 3.068kg, Chinese, 3.266kg.[13] The finding in this study, which is a mean birth weight of 3.17kg falls within this range.

It had in the past been claimed that the new born in Africa weighed much less than his Western European counterpart.[2] This has been adduced to environmental, nutritional (both maternal and community), and other maternal factors. However, judging from the outcome of this study, the mean birth weight of babies in this area is much closer to that of the figure for the American Blacks, suggesting that although the aforementioned factors may actually play a role, racial factors can also be a very important determinant of birth weights in any given population. All previous studies from other parts of the country give lower means.

Another striking finding is that the rural mean obtained from this study was lower than the urban mean. However, it is interesting that this difference is not statistically significant (TABLE II). The rural hospital used for this study has for

decades been offering antenatal care to the rural women in this area. This may actually be the reason for this finding, and if this is so, makes a strong point for provision of adequate primary health care for the rural African populace. We are therefore here probably looking at a modified African village population, which may not represent a typical rural population in this part of the country. It can be postulated that a typical rural population where medical facilities are not readily available may not give us such high figures considering the probable factors mentioned before.

Incidence of low birth weight, as seen in each of the hospitals varied from one centre to the other ranging from 6.62% to 11.4%(TABLE III). Azubike[3] in 1982, in the same area, obtained figures of 4.45 and 4.85% for male and female infants respectively in the urban centres he studied. The corresponding figures for the rural population was 7.76 and 9.34% respectively[3]. In this study, the pre-term babies were excluded. The mean low birth weight rate despite this was 9.53% for all the babies combined. The rate for the male babies was 8.15%, while the rate for the fermales was 11.04%. As is the case with most other studies, there was a higher incidence of low birth weight among the female infants. The reason for this higher incidence of low birth weight in this study is not very clear. However Ibe in 1993, had observed an increased incidence of low birth weights in the UNTH and attributed this to economic factors.[14] Earlier figures recorded in some other parts of the country were much higher.[1,8].

A comparison between low birth weight rates in the rural and urban populations shows a higher incidence among the rural population. While the mean for the urban population was 6.62%, that of the rural population was 11.39%. This difference is statistically significant ($p<0.05$). This again is similar to the finding in the study carried out earlier by Azubuike.[3] The reasons for this difference are probably related to differences in social status and dietary habits.

The frequency distribution of birth weights of the 20,805 babies as shown in Table IV and FIGURE 1 are; 3rd centile 2.004; 25th centile, 2.9004;50th centile, 3.2253; 75th centile; 3.5503 and 97th centile, 4.1505. Figures from other centres may be lower since only full term babies were involved in this study[8].

CONCLUSIONS

The mean birth weight of 20,805 full term babies delivered in four different hospitals in the Igbo ethnic area of Eastern Nigeria was 3.170kg. The mean for the males was 3.2307kg, while that of the females was 3.1080kg. This figure is higher than that obtained from other previous studies done in the western and northern parts of the country, and also figures from other African countries. This difference may be because of the inclusion of pre term babies in these other studies. It is lower than the figures obtained for Caucasians, but is similar to figures for North American Blacks. This finding is interesting as it may point to racial factors as affecting the birth weight of babies. The Low Birth Weight rate was 9.53%. The 3rd centile for the weights was 2.004kg; 50th centile, 3.225kg and 97th centile 4.1505kg.

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