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Original Research Article

Prevalence of Low Birth Weight among Newborns in a Secondary Health Facility in South-South, Nigeria

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Abstract: Low birth weight (LBW) is a major contributor to neonatal deaths and presents a significant burden on neonatal services of developing countries like Nigeria. The study was undertaken to determine the prevalence of low birth weight in a secondary health facility in Port Harcourt, Nigeria. It was a hospital-based cross-sectional study carried out over a two-month period. Five hundred new-borns were recruited for the study. An interviewer-administered semi-structured questionnaire was used to obtain relevant information from the mothers and subsequently all new-borns were weighed within 24 hours of delivery. Three hundred and thirty-seven (67.4%) of the mothers were of high socioeconomic class and 485 (97%) of them had antenatal care. There were 255 males and 245 females with a male to female ratio of 1.04:1. Twenty-six babies (5.2%) were LBW, while the mean birth weight of all the babies was 3.29kg ± 0.53. Out of the 26 LBW babies, 18 (69%) were preterm while 8 (31%). Prematurity was a significant contributor to low birth weight (p=0.0001). Overall, males were significantly heavier than females (p=0.001), however the relationship between gender and low birth weight was not significant (p= 0.766). The prevalence of LBW in the study was 5.2%. Improvement in socioeconomic status and utilisation of antenatal services are important in reducing prevalence of LBW.

Keywords: prevalence, low birth weight, newborns, south-south, Nigeria.

INTRODUCTION

Birth weight has been regarded as the most sensitive and reliable predictor of health, and is universally accepted as an indicator of foetal and neonatal health, both for individuals and an entire population [1]. There exists an inverse relationship between birth weight and mortality rate. By one year of age, approximately 25% of babies who weighed less than 1500grams at birth die compared to 2% of those who weighed 1500-2499 grams and 0.3% of those who weighed 2500 grams or more [2]. It has been found to be an important determinant of a child's ability to survive and to lead a healthy life in future [2]. Therefore, babies born with low birth weight are at a greater risk for gross morbidity and mortality in their early life, and varying consequences later in life for those that survive the very crucial neonatal period.

Low birth weight (LBW) has come to light over the years as a public health problem because of its associated poor health outcome in comparison with normal birth weight. There is increasing evidence that low birth weight is a major cause of neonatal deaths [3]. The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) define low birth weight as birth weight below 2500grams, irrespective of gestational age of the infant [4]. In conjunction with the United Nations Children's Fund (UNICEF), the WHO estimates that 15.5% of all births, or more than 20 million infants are born with low birth weight, with 95.6% of them living in developing countries [5].

Furthermore, low birth weight is increasingly recognized as a significant risk factor for various negative birth outcomes such as foetal and neonatal deaths, short term morbidities like respiratory distress syndrome and necrotizing enterocolitis, and long-term sequelae like blindness, deafness, hydrocephaly, mental retardation, and cerebral palsy [6].

The neonatal mortality rate unfortunately has remained high in sub-Saharan Africa, and low birth weight still remains a major contributor. Low birth weight presents a major burden on the neonatal services especially in developing countries like Nigeria. It creates a great drain on the scarce resources available for adequate health care delivery and family upkeep [7].

This study was designed to determine the prevalence of low birth weight in a secondary health facility in Port Harcourt, south-south Nigeria.

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MATERIALS AND METHODS

It was a hospital-based cross-sectional descriptive study conducted over a two-month period (August – September 2018). The study was carried out at the Obio Cottage Hospital, a community-based health centre located in Obio/Akpor Local Government Area (OBALGA) of Port Harcourt, Rivers State. The hospital started out as a primary health centre but now provides standard comprehensive primary and secondary health care in addition to specialist care in the four core clinical areas of Paediatrics, Obstetrics & Gynaecology, General Surgery and Internal Medicine. The hospital has an elaborate and affordable Health Insurance Scheme that was initiated by the community and a multinational oil company, with full community participation and ownership in the scheme and health centre. Ethical clearance was obtained for the study.

The sample size was calculated using standard statistical methods [8]. A minimum sample size of 303 participants was calculated. The study included all neonates between gestational age of 28 weeks and 41 completed weeks, who were within 24 hours of age and whose parents gave consent. Babies not delivered within the facility, those with gross congenital malformations and macerated stillbirths were excluded from the study. Babies were recruited from the labour wards, neonatal unit and post-natal wards. A semi-structured interviewer-administered questionnaire was administered to the mothers of all study subjects after delivery. The information obtained included: socio-demographic data, relevant maternal antenatal history, delivery history, family and social history. These were obtained directly from the mothers and also from their case notes.

Babies were weighed immediately after birth. Each baby was weighed nude in a warm environment using the weighing scale (Weighmaster, Leicestershire, England) which had a precision of 50g. The scale was standardized daily using a 1.0kg metal weight, while the zero adjustment was made before each measurement. Three measurements were taken and the average recorded as the baby's birth weight in the proforma.

Data were entered into an Excel spread sheet and exported to the Statistical Package for Social Sciences (SPSS) version 20. Categorical variables (socio-demographics, maternal antenatal and delivery characteristics) were summarized as frequencies and percentages and presented in tables. Continuous variables were summarized as means and standard deviations. The qualitative variables were expressed as frequencies and proportions while quantitative variables were summarized as means and standard deviations.

RESULTS

During the course of this study, there were 573 live births in the facility. Of these, 500 babies who met the inclusion criteria were recruited and their questionnaires analyzed.

Age and Gender distribution of the study subjects

Table No 1 shows the age and gender distribution of the study subjects. Three hundred and eighty-two (76.4%) of the study participants were examined within 12 hours of life. The mean age of the males was 8.01±6.55 hours while the mean age of the females was 7.59±6.70 hours. This difference in mean age was not statistically significant (t=0.718, p= 0.473). The overall mean age was 7.81 hours with median age of 7 hours. The male to female ratio was 1.04:1.

Table-1: Age and Gender Distribution of Newborns in the Study Population

Variables	Frequency (n=500)	Percentage (%)
Age category		
0 – 6hours	246	49.2
7 – 12 hours	136	27.2
13 – 18 hours	70	14.0
18 ─ 24 hours	48	9.6
Gender		
Male	255	51.0
Female	245	49.0

Socio-demographic characteristics of the mothers

Table No 2 shows the socio-demographic characteristics of the mothers. The age range of the mothers was 15-45years with 410 (82%) of them < 35 years of age. The mean age of mothers was 30.80 ± 4.40 years. Three hundred and thirty-seven (67.4%) of the mothers were of high socioeconomic class.

Table-2: Maternal Socio-demographics in the Study Population

Variables	Frequency N = 500	Percentage (%)
Age category		
15 – 24 years	35	7.0
25 – 34 years	375	75.0
≥35 years	90	18.0
Socioeconomic status		
High	337	67.4
Middle	142	28.4
Low	21	4.2

Maternal Antenatal Characteristics

Table No 3 below shows the maternal ante-natal characteristics. Almost all mothers had antenatal care at different levels of care. 485 (97%) of mothers had antenatal care at a secondary health centre while 2 (0.4%) did not receive any antenatal care.

Table-3: Antenatal Care Characteristics of Mothers of the Study Subjects

Variables	Frequency	Percentage
Place of supervision of pregnancy		
Tertiary health care facility	7	1.4
Secondary health care facility	485	97.0
Primary health care facility	5	1.0
Private	1	0.2
None	2	0.4
Number of antenatal visits		
<4	22	4.4
≥4	478	95.6

Table-V: Comparing Mean Birth Weight and Gender of the Newborns

	Gender			
Variables	Male Mean ± SD	Female Mean ± SD	t test	p-value
Birth weight (Kg)	3.37±0.53	3.21±0.52	3.507	0.0001*

Relationship between Gender and Low Birth Weight

Of the 500 babies studied, 26 were low birth weight, giving a prevalence of 5.2%. Fourteen (5.5%) males weighed <2.5kg while 12 (4.9%) of the females were of low birth weight. This difference was not significant (p-value= 0.766).

Table-VI: Relationship between Gender and Low Birth Weight

	Low birth weight (<2.5kg)		
	Yes	No	Total
Gender	n (%)	n (%)	n (%)
Male	14 (5.5)	241 (94.5)	255 (100.0)
Female	12 (4.9)	233 (95.1)	245 (100.0)
Total	26 (5.2)	474 (94.8)	500 (100.0)

Chi Square = 0.089; p-value = 0.766

Relationship between Gestational Age and Low Birth Weight

Out of the 26 low birth weight babies, 18 (69%) were preterm low birth weight, while eight (31%) were term low birth weight babies (small for gestational age babies).

Table-VII: Relationship between Gestational Age and low birth weight

	Low birth weight		
	Yes	**No**	**Total**
Variables	**n (%)**	**n (%)**	**n (%)**
Preterm delivery			
Yes (GA <37 weeks)	18 (51.4)	17 (48.6)	35 (100.0)
No (GA ≥37 weeks)	8 (1.7)	457 (98.3)	465 (100.0)
Total	26	474	500

Statistically significant; Fisher's exact p-value = 0.0001

DISCUSSION

The mean birth weight obtained from this study was higher than the 2.7kg reported by [9] in India. The higher mean birth weight in this present study may be due to the variation in the ages of the subjects. While this study included only babies within 24 hours of age, the study by [9] had their measurements taken within seven days of life, when physiologic weight loss would have occurred and many may not have regained their birth weight. This is not surprising as it has been previously reported that the second day of life appears to be one of the days of significant weight loss. Furthermore, the mean birth weight in the present study was slightly higher than that obtained by [10] in Lagos and [11] in Enugu, both in Nigeria. This difference may be due to the lower percentage of low-birth-weight babies in this present study. In addition, the mean birth weight of males obtained in this study was found to be higher than that of the females, which was similar to the findings in other studies [7, 11, 12]. This same finding has been reported by some authors, who found male babies to be heavier than females as a result of their different genetic makeup [13, 14].

The LBW rate of 5.2% obtained in the index study was significantly lower than the 16.5% reported by UNICEFF/WHO, [15] for developing countries and the 27% reported by Ugwu and Eneh [16] in Port Harcourt. This lower LBW rate obtained in this present study could possibly be because almost all the women in this present study had antenatal care. Also, majority of the women were booked and had more than four ante-natal visits because they had to register within their first trimester to fit into the health insurance scheme. Previous studies have reported a reduced rate of LBW babies amongst mothers who had four or more ante-natal visits prior to delivery [17, 18]. This is also in consonance with another study in Port Harcourt that reported a higher rate of low-birth-weight babies amongst un-booked women [19].

Furthermore, socioeconomic class has been shown to be a determinant of birth weight, with women of higher socioeconomic class having bigger babies. The low number of LBW babies obtained from this present study corroborates with this tendency, as majority of the women in this study were of high socioeconomic class [20]. This could be due to the increased awareness of the availability of medical services associated with a high educational and socioeconomic status. This is also in keeping with a previous report that lack of formal education is a significant risk for low birth weight [18]. This finding, though unusual in a conventional secondary health facility, can be explained by the fact that the multinational company in collaboration with the community provides necessary equipment and some level of specialist manpower which are scarce in the conventional secondary health facilities. This therefore, makes it more appealing to people of high socioeconomic status. On the other hand, the study by Ugwu and Eneh [16] was done in the main referral centre in the city where majority of the high-risk pregnancies and LBW babies are referred to for specialized new-born care and majority of the subjects were of middle and low socioeconomic class. However, the LBW rate in this study was higher than the 3.4% reported in Benin City, Nigeria [21]. This difference is likely because this present study included all preterm babies who met the inclusion criteria unlike the Benin city study [21], that excluded preterm babies.

The finding of prematurity as a major contributor (69%) of LBW from this study as against IUGR (31%), is at variance with the findings of some other authors who reported that LBW in developing countries, Nigeria inclusive, is mostly due to intrauterine growth restriction [22, 23]. This has been attributed to the high level of poverty and many low socio-economic class families, leading to absent or inadequate antenatal care, maternal malnutrition, anaemia and their associated complications [23]. Thus, the lower percentage of SGA babies in this present study may also be related to the high socio-economic class of majority of the subjects studied and their early antenatal care registration; as these mothers are likely to be more empowered, have more access to health

information and be at less risk for pregnancy-related problems of nutritional etiology [24]. This further emphasizes the strong positive correlation between poor socio-economic status and LBW [24]. However, it corroborates the findings reported by Ezugwu E et al. [25] in Enugu and Ugwu R et al. [16] in Port Harcourt, who also found prematurity as the major contributing factor to LBW. Although these latter studies were done in major referral centres with specialized neonatal care, it could possibly mark a paradigm shift from previous reports.

This study showed that majority of the mothers had more than four antenatal care visits, which is in keeping with the WHO recommendation of a minimum of four antenatal attendances [26]. Adequate ante-natal care visits in pregnancy has been reported as a significant requirement in the prevention of risk factors for low birth weight. This is because it provides the needed time for interaction between mothers and the health facility for appropriate screening, monitoring and early detection of risks [4]. This finding corroborates that of Onyiriuka A, 2006 in Benin, where absent or inadequate antenatal care was found to be the leading maternal factor associated with low-birth-weight delivery.

Previous studies have demonstrated a relationship between maternal age and LBW [18, 25]. Mothers aged less than 20 years (teenage pregnancy) and 40 years or above are said to be more at risk of having low birth weight babies [25, 27, 28]. This was clearly demonstrated in this study as most (75%) of the mothers were aged between 24 years and 35 years, hence the low percentage of low birth weight babies. This is likely due to the increase in complications in teenage pregnancies (anaemia, hypertensive disorders, preterm labour etc) and pregnancies in women with advanced maternal age (medical disorders; diabetes mellitus and maternal age) [25].

CONCLUSION

The prevalence of low birth weight from this study was 5.2%. Most of the mothers studied were aged 25-34 years, of the middle and high socio-economic class, and received adequate (≥4) antenatal care visits in a well-equipped health care facility. Thus, in order to prevent or reduce the prevalence of low birth weight further, it is imperative to improve the standard of living of the masses via poverty alleviation, educating women of child bearing age on the importance of antenatal care and providing affordable and accessible antenatal care.

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