

# ***Influence of Biosocial Factors on the Incidence of Low Birth Weight Babies in Enugu***

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## **Summary**

**Chukwudi NK, Ejike O, Adimora GN, Ibe BC. Influence of Biosocial Factors on the Incidence of Low Birth Weight Babies in Enugu.** *Nigerian Journal of Paediatrics* 2002; 29:99. A retrospective review of 2,216 deliveries at the labour ward of the University of Nigeria Teaching Hospital, Enugu was carried out for the period January 1, 1995 to December 31, 1996. The relationship between various maternal and neonatal biosocial factors and low birth weight incidence was examined. The incidence of LBW for the period was 12.64 percent with female preponderance [male: female ratio 1:1.33 ( $p < 0.01$ )]. Maternal ages  $< 20$  years and  $\geq 35$  years were associated with relatively high incidences of LBW. Other factors identified as risk factors for the delivery of LBW infants, included lack of antenatal care ( $p < 0.001$ ), female gender, grand multiparity and multiple gestation.

## **Introduction**

LOW birth weight (LBW) infants constitute a major health problem in the developing world as they have poorer chances of survival, healthy growth and development than those with normal birth weight.<sup>1-4</sup>

Besides being more prone to increased mortality, they also tend to experience greater morbidity in terms of mental, physical and neurological handicaps in later life.<sup>5</sup>

<sup>8</sup> Studies have identified some of the determinants of low birth weight. In a critical assessment and meta-analysis of 895 publications in the English and French language medical literature in the period 1970 to 1984, Kramer<sup>9</sup> identified the following factors among others, as having well-established direct causal impacts on low birth weight: infant's gender, racial/ethnic origin, maternal height, parity, and malarial infection. The identification of these and other sociodemographic variables has provided areas of focus in policy formulation and intervention. The present study was

carried out to examine the effects of certain maternal and newborn biosocial factors on the incidence of LBW in Enugu.

## **Materials and Methods**

A two-year retrospective analysis of delivery records at the labour ward of the University of Nigeria Teaching Hospital (UNTH), Enugu between January 1, 1995 to December 31, 1996 was carried out. The following maternal data were extracted: age, parity, booking status (booked or unbooked at UNTH) and nature of pregnancy (singleton or multiple). The gestational age calculated from the LMP was not made use of as it could not be ascertained by physical examination at birth (this being a retrospective review). Newborn data also obtained from the labour ward records, included gender, birth weight and birth order. These did not include data from the Neonatal Unit of the hospital. The birth weight as contained in the delivery records was used. However the available weighing scale (*Waymaster Model*) measures to the nearest 50g.

Statistical analysis of data was done, using the chi-square ( $\chi^2$ ) and Student's 't' tests where appropriate. A  $p$  value  $< 0.05$  was considered statistically significant.

## **Results**

During the two-year period, there were 2,216 deliveries comprising 1,144 males and 1,072 females

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**Table I***Gender Distribution of the Study Population*

Parameters	Males	Females	Total	M:F*
All deliveries	1144	1072	2216	1.07:1
<2500g (LBW)**	120	160	280	1:1.33
Incidence of LBW (%)	10.49	14.93	12.64	-

\* M:F Male: Female ratio

\*\*  $p < 0.01$ 

LBW = Low birth weight

(male: female ratio 1.07:1). Of this number, 280 (12.64 percent) comprising 120 males and 160 females (ratio 1:1.33,  $p < 0.01$ ), were low birth weight (LBW). The incidence of LBW was higher among the females [14.93 percent as opposed to 10.49 percent for males (Table I)].

**Maternal age and LBW**

Table II shows the incidence of LBW in relation to maternal age. The incidence of LBW infants was highest among infants of mothers aged <20 years (LBW incidence 20 percent) followed by those of mothers aged  $\geq 35$  years (incidence 13.80 percent).

**Low birth weight in relation to birth order**

A total of 632 babies were firstborn newborns constituting 28.52 percent of all the deliveries whilst 109 (4.92 percent) were of the birth order of 7 and above. As with the general study population, firstborn newborns constituted the majority of the LBW babies being 90 (32.14 percent) of all LBW babies. However, the incidence of LBW was highest among infants of birth order 7 and above (20.18 percent) followed by those of birth order 1 (14.24 percent) – (Table III).

**Booking status and LBW**

During the study period, 91.97 percent of all deliveries and 72.86 percent of LBW deliveries were infants of UNTH booked mothers. However, the incidence of LBW was 10.01 percent among infants of booked mothers as opposed to 42.70 percent for infants of unbooked mothers ( $p < 0.001$ ) (Table IV).

**Table II***Maternal Age and LBW Deliveries*

Maternal Age (years)	Total Deliveries	<2500g	LBW Incidence (Percent)
15-19	35	7	20.0
20-24	338	45	13.31
25-29	786	100	12.72
30-34	760	87	11.45
$\geq 35$	297	41	13.80

**Table III***LBW Incidence Among Infants of Different Birth Orders*

Birth Order	Total Deliveries	(Percent)*	<2500g	LBW Incidence (Percent)
1	632	(28.52)	90	14.24
2	465	(20.98)	60	12.90
3	378	(17.06)	39	10.32
4	306	(13.81)	38	12.42
5	212	(9.57)	20	9.43
6	114	(5.14)	11	9.65
7+	109	(4.92)	22	20.18
Total	2216	(100)	280	12.64

\*Percentage of all deliveries

**Multiple gestation and LBW**

One hundred and twenty-nine newborns were products of multiple gestation (incidence 5.82 percent) comprising 53 males (41.08 percent) and 76 females (58.91 percent). A LBW incidence of 46.51 percent was found among all the products of multiple pregnancies as opposed to 12.45 percent among the products of singleton pregnancies ( $p < 0.001$ ). Among the products of multiple pregnancies, LBW incidence was 47.37 percent in females and 45.28 percent in males (Table V)

**Table IV**

*LBW Incidence in Relation to Maternal Booking Status*

Parameters	Booking Status		Total
	Booked	Unbooked	
All deliveries	2038	178	2216
<2500g (LBW)	204	76	280
LBW incidence (%)*	10.01	42.70	12.64
% of all LBW	72.86	27.14	100

\*  $p < 0.001$

**Discussion**

Most of the deliveries in this study occurred in mothers aged 25-29 years, a finding in consonance with the observations of other Nigerian workers.<sup>10-12</sup> However, Oni<sup>13</sup> found most of the deliveries he studied, occurring in the age group of 18-22 years. An inverse relationship was observed between the birth order and delivery of low birth weight infants. Initial analysis showed this inverse relationship being maintained down to the birth order of 6, with first pregnancies contributing the highest as previously documented.<sup>5</sup> However, further scrutiny showed that the actual incidence of LBW among the babies belonging to a particular birth order was highest among infants of birth order 7 and above (20.18 percent) followed by those of birth order 1. Possible reasons for these may be (a) the higher incidence of hypertension, and renal diseases with increasing maternal age and parity (b) those who tend to have large number of babies turn out to be those from the lower socioeconomic classes with the attendant maternal malnutrition and (c) lack of sufficient time for recovery in-between pregnancies with consequent delivery of LBW babies. This study showed that the female gender was associated with greater risk of delivery of a low birth weight (LBW) baby, in keeping with those of other workers within and outside Nigeria.<sup>9-11, 14,15, 17-19</sup>

The influence of maternal age on the delivery of a LBW baby showed a higher incidence among babies

**Table V**

*Multiple Pregnancy and LBW Incidence*

Parameters	Males	Females	Total	M:F*
All deliveries	1144	1072	2216	1.07:1
Multiple pregnancies	53	76	129	1:1.43
Singleton pregnancies	1091	996	2087	1.10:1
Incidence of multiple pregnancies (%)	4.63	7.09	5.82	-
<2500g (LBW)	24	36	60	-
LBW incidence in multiple pregnancies (%)	45.28	47.37	46.51	-

\* M:F Male: Female ratio

of mothers aged less than 20 years; this is in conformity with previous reports.<sup>5,9,12</sup> The booking status adversely influenced the incidence of LBW in a way that a higher LBW incidence was obtained among infants who were delivered to unbooked mothers in this study. As earlier observed by Neel and Alvarez,<sup>5</sup> a direct relationship exists between the number of prenatal visits and birth weight. Women who had at least one prenatal care visit delivered babies with larger average birth weights than women who received no prenatal care. Similarly, the average birth weight of babies whose mothers had one to three prenatal visits was lower than the average birth weight of those whose mothers had four to six visits, and the latter was lower than the average birth weight of those whose mothers had seven to nine visits. The incidence of LBW was relatively high among the products of multiple pregnancies, this being in conformity with a previous report.<sup>13</sup> The female preponderance was maintained in this subset of babies.

This study has thus confirmed what others had earlier identified as risk factors for LBW namely, maternal age <20 years and >35 years, lack of antenatal care, female gender, grand multiparity and multiple gestation.

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