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Original Research Article

An insight into the prevalence of low birth weight in Madhya Pradesh

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ABSTRACT

Background: The objective of the study was to to find out the prevalence of low birth weight in Sanwer block in Madhya Pradesh.
Methods: The study was conducted in community health center of Sanwer Tehsil (Indore district) in the state of Madhya Pradesh in collaboration with the department of Community Medicine of Sri Aurobindo Medical College and PG Institute, Indore.
Results: Out of 136 cases observed till completion, 66 cases were of female neonates and 70 cases were of male neonates. Out of 66 females, 36 cases (54.54%) were below the standard 2,500 g. Out of 70 male neonates, 44 cases were below the standard 2,500 g. Average female weight at time of birth was 2.1 kg while the average female height at time of birth was 46.48 cm. Average male weight at time of birth was 2.15 kg and average male height at time of birth was 47.37 cm.
Conclusions: National programmes targeting to address low birth weight are the need of the hour.

Keywords: Low birth weight, Child health, Infant mortality

INTRODUCTION

The WHO distinguishes newborn infants with weight less than 2500 g as low birth weight (LBW) infants.[1] LBW is substantially affiliated to infant morbidity, mortality, and risk of developmental disabilities and diseases amid infants.[2]At the household and individual level, a wide continuum of child health occurs due to many influences. For example; demographic, social and economic conditions are known to be determinants of health in general, including birth weight. At birth, child's weight is accepted as the single parameter of child health that is directly related to the health and nutrition of the mother, and on the other hand, is an important determinant of the chances of the newborn to survive and experience healthy growth and development.[3]

While birth weight is an indicator of a newborn's chances for survival, growth, long-term health and psychosocial development- it is also an indicator of the mother's health and nutritional status.[1-3]

LBW neonates are sub-grouped according to the first birth weight: (a) moderately low birth weight (MLBW): between 1500 and 2499 g; (b) very low birth weight (VLBW): less than 1500 g; (c) extremely low birth weight (ELBW): less than 1000 g.[7]

As per the WHO estimation about 25 million low birth weight babies- up to 20 percent of all infants- are born each year, nearly 95% of them in developing countries.[5,6] Worldwide, neonatal mortality is 20 times more likely for LBW babies compared to heavier babies (≤2.5 kg). Low

birth weight infants are three times more likely than normal birth weight infants to have neuro-developmental complications and congenital abnormalities.[5,6] Thus, this study was carried out with an aim to find out the prevalence of low birth weight in Sanwer block in Madhya Pradesh.

METHODS

Study type

The study type was prospective observational.

Study place

The study was conducted in community health center of Sanwer Tehsil (Indore district) in the state of Madhya Pradesh under the department of Community Medicine of Sri Aurobindo Medical College and PG Institute, Indore.

Study period

The study period was from January 2013 to March 2014.

Study procedure

Due permission from the Institutional Ethics Committee and informed consent from the respondents was saught before commencement of the study. All the low birth weight babies born during January 2013 to March 2013 in the community health center were included in the study.

A total of 150 babies were registered for follow up- out of which 9 mothers denied consent, and 5 failed to complete the study, 136 completed the study. Data on mother (age, husband's name, address, parity, postnatal prescription) and the born babies' details (place of delivery, mode of delivery, sex, birth weight, involvement of doctor/ nurse, number of post-natal visits to healthcare, motivators if any) were noted on the first visit.

Subsequent examination of height and weight was carried out at quarterly interval (3, 6, 9 and 12 months) up to 12 months. Simple random sampling was done in the study for selection of patients.

Statistical analysis

Statistical evaluation of the data obtained was done on SPSS (Statistical Package for Social Sciences) software, version 16.0 (SPSS Inc., Chicago, IL, USA). Descriptive analysis (mean±standard deviation) of the data was done. Chi-square test was applied and the level of significance was set at $p<0.05$(highly significant).

RESULTS

Out of 136 cases observed till completion, 66 cases were of female neonates and 70 cases were of male neonates (Table 1). Out of 66 females, 36 cases (54.54%) were below the standard 2,500 g and next 20 cases were exactly 2,500 g. Out of the 36 below par cases, 34 cases (51.51%) were of MLBW (2,500-1,500 g) and only two (03.03%) cases were of VLBW (1,500-1,000 g). Thus only 10 female neonates (15.15%) were clearly above the required standard, and only 30 female neonates (45.45%) were out of LBW category- remaining 36 (54.54%) being either MLBW or VLBW. Out of 70 male neonates, 44 cases were below the standard 2,500 g and next 26 (33.33%) cases were exactly 2,500 g. Out of the 44 below par cases, 40 cases were of MLBW (2,500-1,500 g) and 4 cases were of VLBW (1,500-1,000 g). Thus, no male neonate (00.00%) was clearly above the required standard, and only 26 male neonates (37.14%) were just out of LBW category- remaining 44 (62.86%) being either MLBW or VLBW. This ratio is statistically insignificant. The male: female ratio in normal and low birth weight is shown in Figure 1.

Table 1: Demographic characteristics of cases.

Demographic characters (mean)	Values
Birth weight	2.16 kg
Age of the mother	22.67 years
Postnatal visits	3
Male neonates	51.47%
Female neonates	48.53%

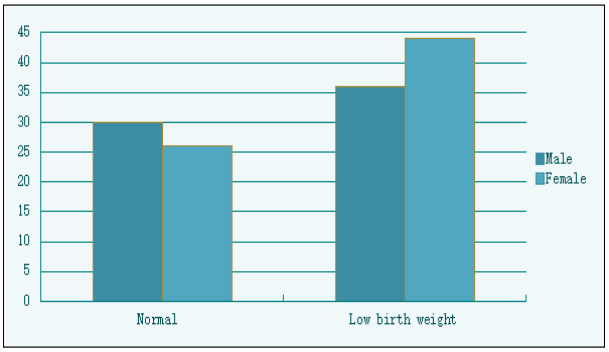

Figure 1: Male: female ratio in normal and low birth weight babies.

The ratio of home and institutional deliveries in normal and low birth weight has been portrayed in Figure 2.

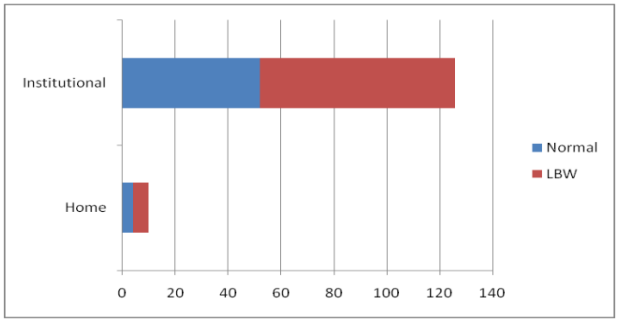

Figure 2: Ratio of home and institutional deliveries in normal and low birth weight.

Birth weight wise distribution of parity has been depicted in Figure 3. Table 2 depicting sex-wise ratio of normal and low birth weight.

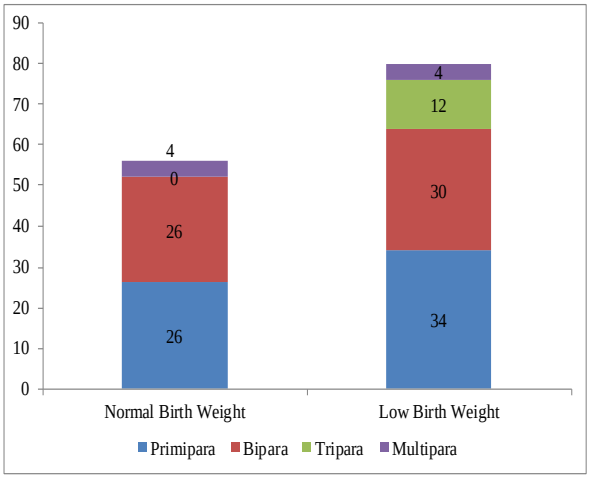

Figure 3: Birth weight wise distribution of parity.

Table 2: Sex-wise ratio of normal and LBW.

Sex	Normal birth weight	LBW	Total
Males	26	44	70
Females	30	36	66
Total	56	80	136

P=0.325

Table 3 designates the average weight and height in female neonates. Average female weight at time of birth was 2.1 kg, at 3 months it was 4.51 kg, at 6 months it was 5.45 kg, at 9 months it was 6.5 kg, at 12 months the average weight was 7.24 kg.

Table 3: Age-wise average weight and height in female neonates (kg)

Average	Female weight (kg)	Female height (cm)
At birth	2.172727	46.48485
3 months	4.519697	52.95455
6 months	5.456061	60.13636
9 months	6.578788	65.42424
12 months	7.24697	70.39394

Average female height at time of birth was 46.48 cm, at 3 months of age the height was 52.95 cm, at 6 months of age the height was 60.01 cm, at 9 months of age the height was 65.42 cm, at 12 months of age the average female height was 70.39 cm.

Table 4 demonstrates the average weight and height in male neonates. Average male weight at time of birth was 2.15 kg, at 3 months of age the weight was 4.07 kg, at 6 months it was 5.81 kg, at 9 months it was 7.83 kg, at 12 months the average weight was 7.8 kg.

Table 4: Age-wise average weight and height in male neonates (cm).

Average	Female weight (kg)	Female height (cm)
At birth	2.157143	47.37143
3 months	4.708571	52.97143
6 months	5.817143	60.14286
9 months	7.008571	65.42857
12 months	7.838571	70.32857

Average male height at time of birth was 47.37 cm, at 3 months it was 52.97 cm, at 6 months of age the height was 60.14 cm, at 9 months it was 65.42 cm, at 12 months of age the average height was 70.32 cm.

Average height in LBW female neonate at time of birth was 46.47 cm and in normal birth weight baby was 47.34 cm, at 3 months average height in LBW was 52.92 cm and NBW was 52.97 cm, at 6 months of age the height in LBW was 59.11 cm and NBW was 60.13 cm, at 9 months of age the height in LBW was 64.38 cm the NBW was 65.43 cm, at 12 months of age average height in LBW was 69.31 cm and NBW was 70.34 cm.

DISCUSSION

In any community, mothers and children constitute a priority group. In developing countries, they comprise approximately 70% of population. Mothers and children not only constitute a large group, but they are also a vulnerable or special risk group.[7]

Mean birth weight of the child in the studied sample was 2.16 kg and the age of mother at the time of delivery was 22.67 year. Thus, this sample represented a population of normal reproductive age (<18 years being taken as early motherhood as per WHO guidelines) with below par (<2,500 g) birth weight.[4]

Out of 136 neonates, 80 (58.8%) were low birth weight and this is far more than already reported in any Indian research report. International Institute of Population Sciences, National Family Health Survey, India published a report of 2005 in 2007 and quoted a rate of 21%.[6-8] Based on the same National Family Health Survey (NFHS) data of 2005-2006, another report quoted the prevalence of LBW as nearly 20%.[9]

Thus, in this sample, there was slight male (51.47%) preponderance but it was statistically insignificant. Many other Indian studies reported similar outcomes but in any study the sex ratio was not significantly different except one.[10-12]

ELBW (<1,000 g) was not represented in the population and even very low birth weight babies (1000-1,500 g) were much less. A similar scenario is seen in the case of male babies. This precludes any gross developmental problem

being statistically significantly apparent in such a small population.[13]

Out of 70 male neonates, 44 cases were below the standard 2,500 g and next 26 (33.33%) cases were exactly 2,500 g. Out of the 44 below par cases, 40 cases were of MLBW (2,500-1,500 g) and 4 cases were of VLBW (1,500-1,000 g).

Thus, no male neonate (00.00%) was clearly above the required standard, and only 26 male neonates (37.14%) were just out of LBW category- remaining 44 (62.86%) being either MLBW or VLBW. As per χ^2 value, sex wise differentiation of birth weight was not significant.

A recent study in West Bengal revealed LBW of 21.49% among infants. They elaboratd that the risk of LBW was higher among women those age <20 years and BMI<18.5 kg/m^2. The main determinants of LBW in this study were preterm delivery (AOR=1.93) and history of chronic illness (AOR=2.09).[14]

Another large-scale study showed 3.7% of LBW. The highest odds of LBW in this study were associated with female newborns (OR: 1.49; 95% CI: 1.47-1.50). Determinants associated with LBW were low educational level of mother, black races, age ≥35 years, less prenatal care visits and primiparous women.[15]

Another study from Ethiopia demonstrated 34.1% of the term newborns with low birth weight.

It was emphasized in the study that special attention should be given to pregnant mothers to get enough rest, extra diet supplements, and improved antenatal services available and approachable to all pregnant women.[16]

In our study incidence of LBW was higher among multiparous women which was in contradiction to a study which depicted that nulliparity was independently associated with LBW as compared to multiparity.[17]

Hinkle et al portrayed that the association between parity and birthweight was non-linear with the greatest increase observed between first and second-born infants of the same mother.[18]

Limitations

Our study, being post-natal and observational could not cover other factors of overall low birth weight. Studies on large population are required, being even more confirmatory, if it is interventional. If the factors are other than genetic, and thus modifiable, appropriate measures to be taken.

CONCLUSION

Birth weight has been proved as the pointer of infant wellbeing. Special attention should be given to maternal nutrition to prevent low birth weight. National programmes targeting to address low birth weight are the need of the hour.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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