

## Research Article

# Predictors of low birth weight: a retrospective study from rural India

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## ABSTRACT

**Background:** The World Health Organization (WHO) has defined the term Low Birth Weight (LBW) as birth weight less than 2500 grams. Nearly, 50% of neonatal deaths occur among LBW babies. The survivors among them are at a high risk of developing malnutrition, recurrent infections and Neuro-developmental handicaps. The purpose of this study was to find out the proportion of low birth weight and to study the correlates of low birth weight from the available data in a health care facility.

**Methods:** The present study was included the retrospective analysis of delivered cases in rural hospital, Bhidi dist. Wardha. Data were collected from delivery register maintained by hospital staff. The delivery register contain the information about maternal age, parity, child birth weight and sex of child. Over a period of 5 years data from January 2005 to January 2010 was taken for study purpose.

**Results:** An analysis of 455 live births revealed that, Average birth weight of all new-borns was  $2.67 \pm 0.42$  kg and 24.4% of new-borns were low birth weight babies and this percentage was higher for female new-borns (63.1). It was seen that the proportion of low birth weight was higher in teenage pregnancies. Maternal age & sex of the new-born was found to be significantly associated with low birth weight.

**Conclusion:** It is observed that low birth weight proportion was higher in teenage pregnancies & primiparous women, therefore, along with teenage pregnancies & primiparous mothers need special attention during the antenatal check-ups.

**Keywords:** Low birth weight, Predictors, Rural

## INTRODUCTION

World Health Organization (WHO) has defined the term Low birth weight as birth weight less than 2500 grams.<sup>1</sup> the birth weight is an indicator which gives us an idea about the quality of life, the socio-economic status, health awareness and nutritional status of the community. The birth weight in all population groups is the single most determinant of the chances of the newborn to survive and experience normal growth and development.<sup>2</sup> A multifactorial inter-relationship exists between the

environment in which pregnant mothers live and the growth of the fetus. This relationship has prompted public health personnel to suggest that birth weight distribution and the proportion of babies born with a Low Birth Weight (LBW) be considered as indicators of socio economic development. LBW is found to be one of the major causes of high mortality and morbidity rates.<sup>3</sup> Worldwide, out of 139 million live births, about 23 million infants had low birth weight i.e., birth weight less than 2.5 kg among newborn babies. In India, the prevalence of LBW infants is about 33%, as compared to

4.5% in industrially developed countries. The perinatal mortality among LBW infants is about 8 times higher than that in infants weighing more than 2.5kg.<sup>4</sup> Low birth weight is one of the most serious challenge in maternal and child health in both developed and developing countries. It is the single most important factor that determines the changes of child survival. Nearly 50% of neonatal deaths occur among LBW babies. The survivors among them are at a high risk of developing malnutrition, recurrent infections and neuro-developmental handicaps.<sup>5</sup> the purpose of the study to find out the proportion of low birth weight in rural setup & to study the correlates of low birth weight from the available data in the health care system.

## METHODS

### Study design

The present study was carried out at Rural Health Training Centre (RHTC) Bhidi, the field practice area of the Department of Community Medicine, Mahatma Gandhi Institute of Medical Sciences, Sevagram, Dist. Wardha.

### Study period

The study was conducted during the period from Jan 2010 to February 2010.

### Sample size

We includes all cases of deliveries conducted in Rural Hospital, Bhidi i.e. from January 2005 to January 2010 were enrolled for study.

### Data collection

Data were collected from delivery register maintained by hospital staff. The delivery register gives information about maternal age, parity, child birth weight and sex of child. The World Health Organization (WHO) has defined the term low birth weight as birth weight less than 2500 grams. As per this definition, babies with a birth weight of <2500 grams are classified as Low birth weight, irrespective of the duration of the gestational period.<sup>1</sup>

### Ethical approval

Ethical approval for the study was granted by the medical superintendent, rural hospital, Bhidi also permission from Head of Department, Department of Community Medicine, Mahatma Gandhi Institute of Medical Sciences, Sevagram District Wardha (Maharashtra, India) was taken.

### Data entry & statistical analysis

Data entered in excel file & analysis of data was done by using EPI info 6.04 software pack. We expressed magnitude in terms of percentages. Average (mean) birth weight & standard deviation was calculated. Chi-square test was used to test the association. For studying epidemiological correlates we used odds ratio as a measure of association. 95% confidence interval (95% CI) was also calculated for odds ratio. P value <0.05 was taken as significant.

## RESULTS

An analysis of 455 live births revealed that, Average birth weight of all newborns was  $2.67 \pm 0.42$  kg and 24.4% of newborns were low birth weight babies (Table 1).

**Table 1: Distribution of newborn according to birth weight.**

Birth weight	No. of new-born	Percentage
<2.5 kg	111	24.4
≥2.5-4.0 kg	344	75.6
<b>Total</b>	<b>455</b>	<b>100</b>

The percentage of low birth weight was higher in female newborn i.e. 63.1% as compare to male child (36.9%). The odds of getting low birth weight were 2.1 times more common among female newborn than the male newborn. The association between gender and low birth weight was statistically significant (P <0.01) (Table 2).

**Table 2: Sex-wise distribution of birth-weight of new borne.**

	Male	Female	Odds ratio (95% CI)	P value
<2.5 kg	41 (18)	70 (31.2)	2.11 (1.33-3.35)	<0.01*
≥2.5-4.0 kg	190 (82)	154 (68.8)		
<b>Total</b>	<b>231 (100)</b>	<b>224 (100)</b>		

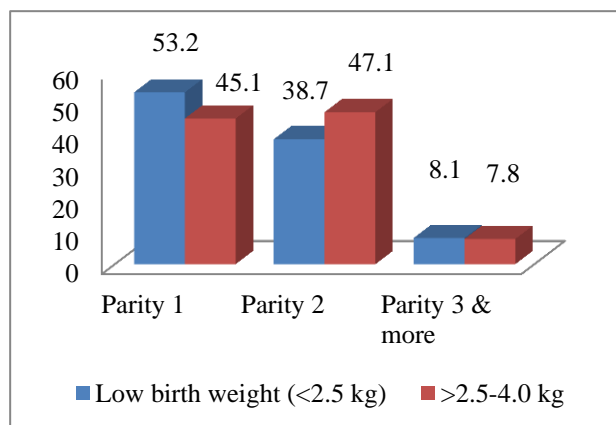
Figures in parenthesis are percentages, CI- Confidence interval, \*statistically significant

**Table 3: Distribution of birth weight according to age of mother at pregnancy.**

	<2.5 kg	>2.5-4.0 kg	Total	P value
≤19	4 (80)	1 (20)	5 (100)	0.02*
>19-<25	77 (25.2)	229 (74.8)	306 (100)	
25-<30	24 (20)	96 (80)	120 (100)	
>30	6 (25)	18 (75)	24 (100)	
<b>Total</b>	<b>111</b>	<b>344</b>	<b>455</b>	

Figures in parenthesis are percentages, \*statistically significant

Highest proportion of LBW babies were born to mothers who were less than 19 years of age. The relationship between maternal age and LBW was found to be statistically significant ( $P < 0.05$ ) (Table 3). The proportion of low birth weight was 53.2% in primiparous women as compare to 2<sup>nd</sup> & 3<sup>rd</sup> or more than third i.e. 38.7 & 8.1, respectively. However, the relationship between parity with low birth weight was not found to be statistically significant ( $P > 0.05$ ) (Figure 1).



**Figure 1: Effect of parity on birth weight.**

## DISCUSSION

The present study shows the proportion of LBW to be 24.4% whereas Negi et al.<sup>6</sup> & Kamaladoss et al.<sup>7</sup> had reported 23.84% and 24.6% LBW respectively in their studies. The proportion of LBW was high among young mothers of age less than 19 years & it was found to be higher in primiparous mothers. Similar observations were also reported by Negi et al.<sup>6</sup> & Kamaladoss et al.<sup>7</sup>

## CONCLUSION

In the present study, we found that the proportion of low birth weight were higher in teenage pregnancies & primiparous women. There will be need for community based

studies to find correlates of low birth weight among teenage pregnancies and parity to prevent and control Low birth weight. It also has indirect impact on reducing neonatal and infant mortality. Give special attention towards teenage pregnancies & primi-parous mothers during the antenatal check-ups.

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