Original Research Article

SOCIO-DEMOGRAPHIC DETERMINANTS OF LOW BIRTH WEIGHT IN NORTHEASTERN CITY, INDIA

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ABSTRACT

Introduction and objectives: Low birth weight is an index of our status of public health, maternal health and nutrition. The major challenge in the field of public health is to identify the factors influencing low birth weight and to institute remedial measures. The study was attempted to assess prevalence of low birth weight and its risk factors affecting low birth weight was conducted among 300 mothers and their respective live born baby in GMCH, Guwahati metro, Assam.

Materials and Methods: A cross sectional study design was carried out in a government hospital among 300mothers using interviewer administered questionnaire. All 300 postnatal mothers who delivered in the hospital during study period were included in the study except still births. All babies were weighted on standard beam balance within 24 hours of delivery and mother's height was measured by height measuring stand. Bivariate and multivariate logistic regression was employed to identify the predictors at p<0.001 and p<0.05.

Results and analysis: The prevalence of low birth weight was found as 26.0% (95%, CL=21.36-31.24) in 300 samples. Mode of delivery had significant association with Birth weight of newborn, X^2 (1, N = 300) = 7.733, P =.005. . Risk of LBW was more than two times as high among mothers with normal delivery than that of Caesarean section (OR=2.09*, 95%CI: 1.24-3.52). Similarly, rural residence(OR=1.24, 95%CI: 0.63-2.44), illiterate mother (OR=1.17 , 95%CI: 0.70-1.97), illiterate husband (OR=1.09, 95%CI: 0.65-1.82), employed mother (OR=2.23, 95%CI: 0.75-6.64), unskilled husbands (OR=1.04, 95%CI: 0.53-2.02), joint family (OR=1.33, 95%CI: 0.75-2.36), religion other than Hinduism (OR=1.54, 95%CI: 0.87-2.72) and low monthly income less than Rs. 20000 (OR=1.17, 95%CI: 0.69- 1.96) were found to be higher risk of LBW.

Discussion and conclusion: The prevalence of low birth weight was found to be very high and it was associated with many risk factors related to maternal health and services. Hence it is recommended to improve maternal health through strengthening the existing maternal services at the basic level of community.

KEY WORDS: Low Birth Weight, Maternal Age, Parity, ANC Visit, HB% Level, Gestational Age, High Risk Behavior.

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BACKGROUND

Low birth weight is an index of our status of public health, maternal health and nutrition. It is a major factor determining child survival, future physical and mental development and also associated with chronic diseases later in life [1,2]. Low birth weight has been defined as birth weight of less than 2500gm (WHO, 1984) [3]. Globally, more than 20 million infants are born with low birth weight. Prevalence of LBW is very high in India (33%) as compared to developed countries (4.5%) [4].

According to NFHS-3 data, prevalence of low birth weight is 21.5% in India [5].

Low birth weight is either caused by preterm birth (that is, a low gestational age at birth, commonly defined as younger than 37 weeks of gestation) or the infant being small for gestational age (that is, a slow prenatal growth rate), or a combination of both [6].

Low birth weight is associated with many socio-demographic determinants such as residence (urban-rural), mother's age and occupation, education, parity, sex of baby, antenatal care, maternal height and weight, gestational age of mother, birth order, the family's income and many maternal conditions such as nutritional status, health status.

Low birth weight babies are at greater risk for complications like low oxygen levels at birth, trouble staying warm, trouble feeding and gaining weight, infection breathing problems and immature lungs, nervous system problems and sudden infant death syndrome(SIDS) and also cerebral palsy, blindness deafness and developmental at delay may be long term complications [7].

Prenatal care is extremely essential measure of preventing preterm births and low birth weight babies. Maternal nutrition and maternal health are the most essential aspects of prenatal care.

MATERIALS AND METHODS

A cross sectional study was carried out in a Government hospital, Guwahati metro, Assam in 2016 from October to December. The study was conducted among 300 mothers using interviewer administered questionnaire. All 300 postnatal mothers who delivered in the hospital during study period were included in the study except still births. The sample size 300 was calculated taking minimum 25% prevalence of low birth weight with 20% of permissible error. Consecutive non-random sampling technique was used for selecting samples. Ethical clearance was obtained from the ethical committee of Assam down town University. After obtaining permission from hospital authority and verbal consent was taken from each sample. All babies were weighted on standard beam balance within 24 hours of delivery and mother's height was measured by height measuring stand up to the accuracy of 0.5 cm. LBW was defined as a birth weight of <2500 gm. A predesigned and pretested structured interview schedule related to socio-demographic variables and the maternal risks factors of LBW among post-natal mothers were used for collecting information. The mothers whose were critically ill at the time of data collection and whose mothers had still birth baby were excluded from the study sample. The data collected was compiled, tabulated and subjected to statistical analysis wherever applicable. Statistical analysis was done using SPSS for windows, version 18.0. Bivariate and multivariate logistic regression was employed to identify the predictors at P<0.001, and p<0.05.

RESULTS AND DISCUSSION

Socio-demographic profile of the Respondents: Birth weight of newborn > 2.5kg was 74%, and <2.5 kg was 26%. Majority of newborn were male 53% (159) and majority of baby 88.33% (265) born before 37 weeks of gestation. Majority of newborns mode of delivery was caesarean section (60.67%) as compared to normal delivery (39.33%). In place of residence, 81.00% of mothers from rural and 19.00% from urban. In regards of mother's educational status, 51.67% of mothers were literate, 48.33% were Illiterate. 52.33% of father Literate and 48.33% were Illiterate. 95.33% of mothers were housewife and 4.67% were employed. 81.67% of fathers were unskilled and 18.33% skilled workers. 68.67% of mothers belong to joint family and 31.33% were nuclear family. 74.33% of mothers belong to Hindu religion, 24.00% Muslim and 1.67% were Christian. Majority of mothers (47.33%) had Monthly income were Rs. 5001-10,000, 43.33% of mothers had < Rs. 5000 and 9.33% of mothers had > Rs. 10,000. (**Tab-1**)

Prevalence of low birth weight: The prevalence of low birth weight in the present study was 26% (95% CI: 21.36%-31.24%) and 88.33% of newborns were preterm baby. The normal baby was 74% (95% CI: 68.76%-78.64%).(**Table-2**) This finding is similar to a study conducted by M Krishnatreyal[8] in Assam (28.40%) while it is 4%-5% in developed countries (Trivedi and Mavalankar).[9] Another previous study in Assam conducted by Barua in 1973, the prevalence of LBW among Assamese infants was 45.8%.[10]The variation in the prevalence may be due to varying geographic location, socio-cultural and

socio-economic differences among the different communities.

In present study, the prevalence of low birth weight was high among those mothers residing in rural areas (65, 83%) whereas it was 71.43% in study by Dandekar [11], 28% in study by Swarnatatha N [12]. High prevalence of low birth weight was found among illiterate mothers (42, 53.8%) while it was low prevalence rate in a study conducted by Rahul et al (5.71%). Rizvi et al. [13] and Mavalankar et al [14] showed significant association between maternal education and LBW. housewife mothers (72, 92.3%). Lack of knowledge and awareness regarding the antenatal care, antenatal visits and risk factors may be cause of LBW among illiterate mothers. High prevalence of LBW was found in less than 2000/- monthly income (42,) although it was not statistically significance, several studies reported similar findings [15-17]. (**Table-3**)

Socio-demographic determinants of low birth weight: Association between prevalence the low birth weight with demographic variables viz. Mode of delivery, Place of residence, Mother's educational status, Husband's educational status, Mother's occupation, and Husband's occupation, Types of family, Religion and Monthly income were also examined by chi square test of independence. It found none other than Mode of delivery had significant association with Birth weight of newborn, X^2 (1, N = 300) = 7.733, P =.005. (Table 4)

Normal Mode of delivery was found to be risk of LBW than that of Caesarean section (OR=2.09, 95%CI: 1.24-3.52). Similarly, rural residence (OR=1.24, 95%CI: 0.63-2.44), illiterate mother (OR=1.17 , 95%CI: 0.70-1.97), illiterate husband (OR=1.09, 95%CI: 0.65-1.82), employed mother (OR=2.23, 95%CI: 0.75-6.64), unskilled husbands (OR=1.04, 95%CI: 0.53-2.02), joint family (OR=1.33, 95%CI: 0.75-2.36), religion other than

Hinduism (OR=1.54, 95%CI: 0.87-2.72) and low monthly income less than Rs. 20000 (OR=1.17 , 95%CI: 0.69- 1.96) were higher risk of LBW of newborn. (**Table-4**)

An analysis of variance showed that the effect of birth weight of newborn was insignificant on Hb% level of mother during delivery, F (1,298) = 0.814, P =0 .368. In other words, mother of low birth weight of newborn (M=10.23, SD=1.52, Range: 6.70-14.20) had same Hb% level of mothers with normal birth weight of newborn, (M=10.41, SD=1.50, Range: 5.10-14.90), t(298)=-.903, P =0.368(two tailed). (**Table-5 &Fig-1**) which was indicating that average all mothers were mild anemic (according to WHO classification).

Table 1: Socio-demographic profile of the respondents.

VARIABLES	CATEGORIES	FREQUENCY	PERCENTAGE (%)
Birth weight of newborn	<2.5 kg	78	26.00%
	> 2.5kg	222	74.00%
Mode of delivery	Normal	118	39.33%
	Caesarean section	182	60.67%
Place of residence	Urban	57	19.00%
	Rural	243	81.00%
Mother's educational status	Illiterate	145	48.33%
	Literate	155	51.67%
Husband's educational status	Illiterate	143	47.67%
	Literate	157	52.33%
Mother's occupation	Housewife	286	95.33%
	Employed	14	4.67%
Husband's occupation	Unskilled	245	81.67%
	Skilled	55	18.33%
Types of family	Nuclear	94	31.33%
	Joint	206	68.67%
Religion	Hindu	223	74.33%
	Muslim	72	24.00%
	Christian	5	1.67%
Monthly income	< Rs. 5000	130	43.33%
	Rs. 5001-10,000	142	47.33%
	> Rs. 10,000	28	9.33%
Valid	Total	300	100.00%

Table 2: Frequency and descriptive statistics of Birth weight of newborn.

Birth weight of newborn	Count	%	95%CI	Range	Mean	SD	P -value
<2.5 kg	78	26.00%	21.36%-31.24%	6.70-14.20	10.23	1.52	0.368NS
≥ 2.5kg	222	74.00%	68.76%-78.64%	5.10-14.90	10.41	1.5	
Total	300	100.00%		5.10-14.90	10.36	1.5	

NS =Not Significant

Table 3: Bivariate cross frequency of socio-demographic factors influencing low birth weight and chi square Test of Association.

Variables		Birth weight of newborn		Total	Chi Sq	df	P-value
		<2.5kg	≥2.5kg				
Mode of delivery	Normal	41	77	118	7.733	1	0.005**
	Caesarean section	37	145	182			
Place of residence	Urban	13	44	57	0.373	1	0.541 NS
	Rural	65	178	243			
Mother's educational status	Illiterate	40	105	145	0.367	1	0.545 NS
	Literate	38	117	155			
Husband's educational status	Illiterate	36	107	143	0.097	1	0.756 NS
	Literate	42	115	157			
Mother's occupation	Housewife	72	214	286	2.169	1	0.141 NS
	Employed	6	8	14			
Husband's occupation	Unskilled	64	181	245	0.01	1	0.919 NS
	Skilled	14	41	55			
Types of family	Nuclear	21	73	94	0.953	1	0.329 NS
	Joint	57	149	206			
Religion	Hindu	53	170	223	2.684	2	0.261 NS
	Muslim	24	48	72			
	Christian	1	4	5			
Monthly income	< Rs. 5000	42	94	130	0.529	2	0.768 NS
	<Rs. 10000	30	106	142			
	> Rs. 10000	6	22	28			
Total		78	222	300			

** Highly significant at P(<.01), NS =Not Significant

Table 4: Relative Risk Estimates and Odd Ratios Analysis in demographic risk factors for LBW.

Variables		Odd of outcome for LBW	OR	95%CI	
				Lower	Upper
Mode of delivery	Normal	0.53	2.09*	1.24	3.52
	Caesarean section	0.26			
Place of residence	Rural	0.37	1.24	0.63	2.44
	Urban	0.3			
Mother's educational status	Illiterate	0.38	1.17	0.7	1.97
	Literate	0.32			
Husband's educational status	Literate	0.37	1.09	0.65	1.82
	Illiterate	0.34			
Mother's occupation	Employed	0.75	2.23	0.75	6.64
	Housewife	0.34			
Husband's occupation	Unskilled	0.35	1.04	0.53	2.02
	Skilled	0.34			
Types of family	Joint	0.38	1.33	0.75	2.36
	Nuclear	0.29			
Religion	Others	0.48	1.54	0.87	2.72
	Hindu	0.31			
Monthly income	< Rs. 10000	0.38	1.17	0.69	1.96
	>Rs. 10000	0.33			
Total					

* Significant at P(<.05)

Table 5: Distribution of Maternal Hb% level during delivery.

Variable	N	Range	Mean	SD
Hb% level during delivery	300	5.1-14.9	10.364	1.5
Valid N (listwise)	300			

Hb% level during delivery

Fig. 1: Analysis of Mean.
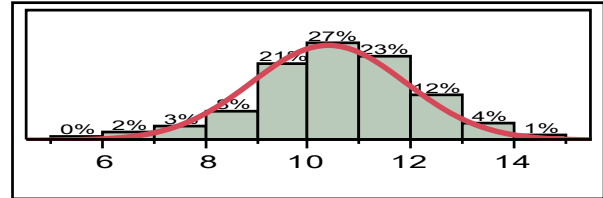
Normal(10.36,1.50)

CONCLUSION

Prevalence of low birth weight was found to be very high in north each India. Maximum newborns were preterm (88.33%) in present study. Mode of delivery, place of residence, mother's educational status, mother's occupation, religion and monthly income are important socio-demographic factors influencing birth weight of the babies. Maternal education and maternal services like nutrition, sanitation, immunization, through different programme by the governments may improve the birth weight. This may directly influences the mortality and morbidity rates of our country.

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