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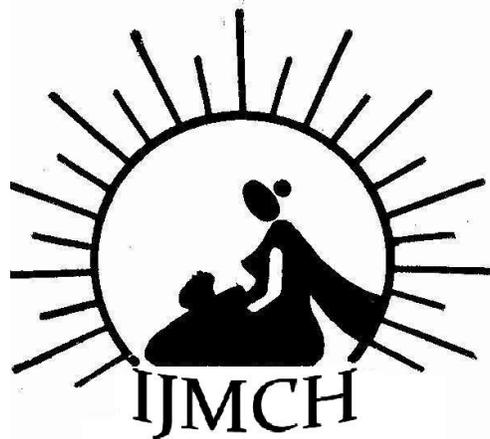
Ram Rama
Bhattacharyya Krishnadas
Jha Sankar Nath

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What is the proportion of low birth and factors associated with it?

Bio-social Determinants of Low Birth Weight – A Hospital Based Study in Bihar

Ram Rama,*+ Bhattacharyya Krishnadas,*++ Jha Sankar Nath**+++

*Professor & HOD, Assistant Professor, **   Deptt.of Community Medicine +MGM Medical College, Kishanganj, Bihar ++Burdwan Medical College, Burdwan,+++Calcutta National Medical College,

Correspondence: Dr. Krishnadas Bhattacharyya

E-mail   drkrishnadasbhattacharyya@gmail.com

Abstract

Research Questions: What is the proportion of low birth and factors associated with it?

Setting: Gynaecology & Obstetrics Department of M.G.M Medical College and L.S.K Hospital, Kishanganj, Bihar.

Study Design: Cross-sectional, observational study

Participants: 81 live births

Methodology: Randomly 3rd quarter of the year2009 was chosen. Total 81 live births during July to September, 2009 were selected for the study. Birth weight was recorded, interview of mothers were taken and antenatal cards were reviewed.

Results: 33.3% of new born were found to be of low birth weight. Statistically significant association was observed between LBW and mothers' age, religion, occupation of mothers, having consumption of extra meals and IFA during pregnancy. No significant difference was found between the occurrence of LBW and literacy status of mothers and type of family.

Key words: Low Birth Weight, Maternal Age, Antenatal Care, Literacy, Occupation

Introduction

Infant mortality rate though has come down substantially in last few years yet it is very high in most part of the country including the state of Bihar in comparison to other developed countries. India has committed to bring down the infant mortality rate to level below 30 by this year 2010[1].

Low birth weight is the single most important factor determining the survival chance of the child. Infant mortality rate is about 20 times greater for low birth weight babies than the other babies [2]

Almost 8 million babies are born in India each year (almost one third neonates are LBW), an incidence of 30 percent (highest in the world) – which is nearly 40 percent of global burden – the highest of any country [3, 4].

In a multicentric ICMR study, the incidence of low birth weight was as high as 38.1% in the rural population and 41.4% in the urban slum cohort. In India 75% of neonatal deaths occur in LBW babies it is limited that 50% of infant deaths and 70 % of perinatal deaths occur in LBW babies in the country [5]. One of the National Health Policies of MCH Goals is reduction Low Birth weight babies from 30% (current level) to 10% [6]. In most parts of India, the mean birth weight is between 2.7 to 2.9 kg [7].

LBW is defined by WHO as birth weight of less than 2500 grams. There are two main groups of LBW babies – those from prematurely (short gestation) and those with fetal growth retardation (IUGR) or small for date. Reduction of LBW is essential for child survival. In the context there is an urgency need to explore the reasons for occurrence of low birth weight. In the above perspective the present study was carried out with the objective of –

1. To find the occurrence of the low birth weight among the institutional births.
2. To determine the relevant factors associated with such births.

Materials and Methods

The present study was conducted in Gynecology and Obstetrics department of MGM Medical College and LSK Hospital, Kishanganj, Bihar during July 09 to September 09. It is a cross sectional observational study.

Sample size was calculated with the help of PEPI software. Considering the prevalence of LBW in the state of Bihar as 30% with allowable difference of 10% at 95% confidence interval the sample size was 81.

A total of 81 live births were studied. They are selected by systematic random sampling technique from the hospital delivered mothers from July 09 to September 09 (Total birth during the period was 601). The data were collected by reviewing the bed head tickets & antenatal record cards, weighing of babies & interviewing the postnatal mothers through predesigned & pretested proforma with the help of junior faculties / interns of Department of Community Medicine at M.G.M.C. LSK Hospital Kishanganj, Bihar.

A pregnant woman was considered to have received full package of antenatal care if she availed 3 or more ANC check up, received two doses of TT or booster and received 100 IFA tablets [8].

Results

Table I Distribution of Respondents According To Age and Religion

Age (in years)	Religion				Total	
	Hindu		**Muslim**			
	No.	**%**	**No**.	**%**	**No.**	**%**
<u><19</u>	4	(12.1)	1	(2.0)	5	(6.2)
20 - 29	18	(54.6)	42	(87.5)	60	(74.1)
30 - 39	10	(30.3)	3	(6.3)	13	(16.0)
40 -49	1	(3.0)	2	(4.2)	3	(3.7)
Total	**33**	**(40.8)**	**48**	**(59.2)**	**81**	**(100)**

Out of total of 81 live births, 27 low birth weight babies were reported (33.3%). There were 59.2% Muslim mothers, rest were Hindus. Majority of mothers were in the age group of 20 to 29 years (74.1%) followed by 30 to 39 years (16.0%) and 6.2% were teen aged mothers (Table I).

Out of total low birth weight babies only 14.8% were Hindu by religion and rest were Muslim (85.2%), whereas those mothers were not given birth of LBW babies belonged to Hindu (53.7%0. The difference was statistically significant (P = 0.00182) shown in (Table II).

It was observed from (Table -2) that occurrence of low birth weight babies was more among teen age mothers (7.4%) and those who were more than 30 years age groups (33.3%) than who gave birth to more than 2.5 kg babies (5.6% and 7.4% respectively). The difference was statistically significant (P= 0.0022227).

The education of mother and type of family had no significant influence for occurrence of LBW in this study (TableII) .Maximum mothers (85.2%) were illiterate and just literate group who gave birth to LBW babies, similarly 79.7% mothers gave birth of more than 2.5 kg weight babies.

Considering the occupation of the mother it was observed from (Table II) that occupation had a significant role for occurrence of LBW (P = 0.00334).

Out of total low birth weight babies 59.3% mothers were engaged in agricultural work , whereas only 22.2% among normal birth weight . The socio economic status also had a significant role for occurrence of low birth weight (P= 0.00701) i.e. incidence of low birth weight was decreased with increase in socio economic status (Table II).

Regarding antenatal care only 14.85% had taken extra meal among total mothers who gave birth of LBW babies. The difference was statistically significant (P=0.0354) shown in (Table III).

It has been also observed from (Table III) that majority (81.5%) of mothers who gave birth of LBW babies had taken less than 10hrs rest and sleep than mothers (64.8%) who gave birth of > 2.5kg weight babies , This difference was statistically significant (P=0.00005).

Table II Biosocial Determinants of Low Birth Weight

Characteristics	Birth weight < 2.5 kg (n = 27)	Birth weight >2.5 kg (n = 54)	Chi-square	P value
Religion				
Hindu	4 (14.8)	29 (53.7)		
Muslim	23 (85.2)	25 (46.3)	9.72	P = 0.00182
Age				
< 19	2 (7.4)	3 (5.6)		
20 – 29	14 (51.9)	46(85.2)		
30 – 39	9 (33.3)	4 (7.4)		
> 40	2 (7.4)	1 (1.8)	9.36	P = 0.0022227
Education				
Illiterate	18 (66.7)	30 (55.6)		
Just literate	5 (18.5)	13 (24.1)		
Up to primary	1 (3.7)	6 (11.1)	0.52	P = 0.4718
Up to secondary	3 (11.1)	3 (5.5)		
H.S & above	0 (0.0)	2 (3.7)		
Type of family				
Joint	20 (74.1)	33 (61.10		
Nuclear	7 (25.9)	21 (38.9)	0.83	P = 0.364
Occupation				
House wife	5 (18.5)	30 (55.6)		
Agricultural worker	16 (59.3)	12 (22.2)		
Daily labor	5 (18.5)	11 (20.4)	8.61	P = 0.00334
Service	1 (3.7)	1 (1.8)		
Socioeconomic status				
Upper high 10000& above	0 (0.0)	4 (7.4)		
High 5000-9000	1 (3.7)	9 (16.7)		
Upper middle3000-49999	2 (7.4)	6 (11.1)	7.27	P = 0.00701
Lower1500-2999	3 911.1)	10 (18.5)		
Poor 500-1499	6 (22.2)	11 (20.4)		
Very poor < 500	15 (55.6)	14 (25.9)		

Table III Determinants of Low Birth Weight In Relation To Antenatal Care

Characteristics	Birth weight < 2.5 (n==27)	Birth weight ≥ 2.5 (n=54)	Chi-square	P value
Extra meal Yes No	 4 (14.8) 23 (85.2)	 22 (40.7) 32 (59.3)	 4.43	 P = 0.0354
Average duration of rest & sleep < 10 hrs > 10 hrs	 22 (81.5) 5 (18.5)	 35 (64.8) 19 (35.2)	 1.64	 P = 0.0197
No. of IFA tablets taken < 100 > 100	 22 (81.5) 5 (18.5)	 16 (29.6) 38 (70.4)	 17.41	 P =0.0000302
N0. of antenatal check- up < 3 > 3	 21 (77.8) 6 (22.2)	 12 (22.2) 42 (77.8)	 20.77	 P = 0.000005

There was statistically highly significant difference (P=0.0000302) regarding IFA tablet use. Among LBW babies group, 81.5% mothers took less than 100 IFA tablets, whereas 29.6% among the normal birth weight groups.

It was denoted (Table III) that 77.8% mothers had less than 3 antenatal check- up among low birth weight babies and 22.2% among >2.5 kg birth weight group . The difference was statistically significant (P=0.00005).

Discussion

Presently about 22% of the babies born in India are of low birth weight (less than 2.5 kg) [9] , whereas in the present study 33.3% of the babies born of low birth weight which is higher than the National figure.

Low birth weight (LBW) is multifactorial in etiology. Nearly 50 risk factors have been evaluated for their role in causing prematurity and intra uterine growth retardation [10]. In the present study the significant factors are religion, occupation, socio economic status, IFA tablet taken, extra meal taken, number of antenatal check up, average duration of rest & sleep. These findings corroborated with the findings of the earlier study [8]. The statistically significant risk factor was religion, may be indirectly related to poor socio-economic status.

It was found that socio-economic status was significantly associated with low birth weight. This may be due to the fact that in a lower socio-economic class the woman are

overburdened with work and also there is associated malnutrition , which contributes to a large no. of women delivering low birth weight infants.

Similar observations were also seen in studies conducted by Ice berg *et al* [11] and Gawade *et al* [12].

Iron and folic acid supplementation during pregnancy as recommended by WHO should be implemented until, more information is available [10]. Importance of which is corroborated with the findings of our study. The effect of literacy is not found here, probably due to small number of observations.

The literacy status of mothers had no influence on the occurrence of LBW – these findings of the study did not corroborate with the findings of earlier studies [13,14,15]. Full ANC package (those having three ANC visit, IFA tablets consumption and TT_2 / Booster) received by 43.9%, mothers in the present study which is higher than earlier study by ICMR group [8] where it was 39.6% in Bihar and less than All India average (52.5%).

Conclusion

The present study showed that low birth weight prevalence is still high in state of Bihar in comparison to other states and National Average. Literacy status and type of family had no influence on occurrence of low birth weight. The relevant factors like rest, number of antenatal check-up, IFA tablet consumption, extra meal taken, occupation, religion had got statistical association for the occurrence of low birth weight. The present study recommends that the reduction of low birth weight is an urgent need by strengthening the antenatal care, proper utilization of supplementary feeding program, nutrition education etc. Proper training of health provider and community awareness to be enhanced by key messages through IEC.

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