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Original Research Article

A Study of Associated Factors of Low Birth Weight Babies in a Secondary Care Center

Richa Nigam[1], Neha Bhaskar[2], Akanksha Jain[3], Sanjay S Agarwal[4], Sanjay Khare[5]

[1]Associate Professor, Department of Community Medicine
[2]MBBS student Pre final year
[3]Assistant Professor, Department of Community Medicine
[4]Professor, Department of Community Medicine
[5]Civil Surgeon, District Hospital

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Corresponding author: Richa Nigam
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Abstract

Background: Low birth weight is one of the major determinants of prenatal survival, infant morbidity and mortality as well as risk of developmental disability and illness in future.

Objectives: The objectives of present study are to determine the proportion of low-birth-weight deliveries and its associated maternal sociodemographic and biological factors in a secondary care hospital.

Methods: A hospital based cross sectional study was conducted among 295 post-natal mothers who delivered the babies in a secondary care hospital of Madhya Pradesh during the study period of 2 months and 12 days from July 2019 to September 2019.The data was collected by conducting face to face interview by using the pretested questionnaire and then the data was analysed using the Microsoft excel.

Results: Among 295 respondents 72 (24.4 %) mothers delivered low birth weight babies, 50 (16.95 %) mothers had preterm delivery and history of abortion was found in 85(28.81%) respondents. Among low birth weight delivery the dietary intake ($p<0.0001$), family income ($p = .01$). period of gestation ($p<0.0001$) and history of abortion ($p = .002$) were found to be statistically significant when compared with normal birth weight deliveries.

Conclusion: Socioeconomic status, maternal nutrition, preterm labor and previous history of abortion are associated with occurrence of low birth weight deliveries. Awareness regarding nutrition, selfcare, is important in prevention of low birth weight babies. There is a need to strengthen the existing maternal services at the basic level of community.

Keywords: Low birth weight, sociodemographic factors.

Introduction

Low birth weight (LBW) refers to birth weight below 2500gm [1]. It is one of the major determinants of infant survival, mortality as well as risk of developmental disability and illness in future [2]. Neonatal death among newborns weighing (1500-2500) is 20 times higher than among newborns of normal weight [3,4].

Low birth weight is one of the major reasons for high under-nutrition rates in Indian children. India (South Asia) has the highest low birth weight babies rates in the world (WHO 2004) of underweight among < 5 years children [5]. According to NFHS-5 in the state of MP 41.3% is infant mortality rate. 33 % of children are underweight, 35% Stunted, 19% are wasted, which are much above the national figure (National family health survey 2019 - 2021).

Low birth weight is considered as a single most important predictor of infant mortality especially of death within 1 month of life [6]. Low birth weight is considered as sensitive index of nation's health and development [7]. World Health Organization estimates that globally about 25 million low birth weight babies are born each year, constituting 14% of all live birth, nearly 93% of them are in developing countries [8]. World health organization estimates that globally about 25 million low birth weight babies are born each year, constituting 14% of all live birth, nearly 93% of them are in developing countries [9]. The cause of low birth weight is multi-factorial. Low birth weight related to maternal malnutrition is a cause factor in 60-80 % of neonatal death [10,11]. Thus, it is necessary to identify factors prevailing in a particular area responsible for low birth weight babies so that if further research is carried out for the improvement of this condition we would be able to improve the condition of underweight children of this area. The objectives of present study are to determine the proportion of low-birth-weight deliveries and its associated maternal sociodemographic and biological factors in a secondary care hospital.

Methods

A hospital based cross- sectional study was conducted in a secondary care center Vidisha Madhya Pradesh. The study subjects were the mothers in the postnatal ward and special newborn care unit (SNCU) of District Hospital who delivered the babies in the study duration of 3 months from July to September 2019. Ethics approval was taken from the Institutional Ethics Committee of Atal Bihari Vajpayee Government Medical College. Permission from respective departments of the medical college and District Hospital was taken. Written informed consent was obtained from respondents before the commencement of data collection. The sample size collected using the formula $n = z^2 p(1-p)/d^2$

Based on the assumptions

95% Confidence Interval
z = 1.96
d = 5% (Margin of error)
p = 50% magnitude to get maximum sample size
n = 384

The inclusion criteria for the mother were all who delivered during the study duration and has given the consent to be in the study whereas exclusion criteria were those with sick babies those who has not given consent.

The data collection was done from the mother by conducting face to face interview using a pretested questionnaire. 24-hour recall method was used for dietary assessment [12] Data compilation was done followed by editing and coding. Completeness of data was ensured before coding. The variables used were maternal age, education, occupation, family income, period of gestation, history of abortion, rest and dietary details during pregnancy. Data was analyzed using Microsoft excel, 95 % confidence interval was used to see the strength of assessed factors with $p < .05$ was considered statistically significant. Descriptive statistics was applied for sociodemographic, biological and behavioral details of the subjects. Proportion of LBW was calculated as percentage. Association between different variables between normal and low birth

weight deliveries was calculated using chi square test cross tabulation. Total number of study subjects taken for calculation were 295 after ensuring for data completeness.

Results:

Table 1: Socio- demographic characteristics of mothers (n=295)

Age of mothers	**Frequency**	**Percentage**
<20 years	57	19.32%
20-30 years	213	72.20%
>30 years	25	10.16%
Education		
Illiterate	94	31.86%
Literate	201	68.13%
Occupation		
Housewife	250	84.74%
In job	45	15.25%
Family income		
<20,000	190	64.40%
20-40,000	96	32.50%
>40,000	09	3.050%
Family		
Nuclear	72	24.40%
Joint / 3 generation	223	75.59%
Place of Residence	103	
Rural	192	34.91%
Urban		65.08%

Table 1: Total of 295 respondent were included in the study out of which 213 (72.2%) of the mothers were between the age group of 20 to 30 years while 57 (19.32%) were below the age of 20 years and 25 (10%) were above 30 years of age. 185 (62.7%) of the respondent took afternoon rest greater than or equal to 2 hours during pregnancy while 110 (37.3%) took less than 2 hours.

Regarding the education status it was observed that 94 (31.8%) of mothers were illiterate. 45 (15.25%) mothers were on job while 250 (84.7%) were housewives. 190 (64.40%) of mothers belong to the family whose monthly income is below 20,000 and in 96 (32.5%) the income is between 20-40,000 while in 9 (3.05%) the income is greater than 40,000. 72 (24.40%) were belonging to nuclear families and 223 (75.59%) were from joint families, 103 (34.9%) were from rural area and 192 (65.08%) from urban area.

Table 2: Maternal Biological and Behavioural characteristics (n = 295)

Serial number	Characteristics	n (%)	95% CI
1	Low Birth weight	72(24.41%)	(19.61 – 29.72)
2	Preterm delivery	50(16.95%)	(12.85 – 21.73)
3	History of abortion	85(28.81%)	(23.71 – 34.35)
4	4 ANC Visits	190(64.41%)	(58.65 – 69.87)
5	Diet more than pre pregnant state	237(80.34%)	(75.34 – 84.72)

6	Rest <2 hrs during afternoon	185(62.71%)	(56.92 – 68.25)
7	Regular IFA intake	220(74.58%)	(69.21 – 79.45)

Table 2: Among 295 respondents 72 (24.4 %) mothers delivered low birth weight babies with CI (19.61–29.72%). 50 (16.95%) mothers had preterm delivery with CI (12.85–21.73%). History of abortion was found in 85 (28.81%) with CI (23.71 – 34.35%). 4 ANC visits was found with 190 (64.41%) with CI (58.65 – 69.87%) 237 (80.34%) mothers had more diet than pre pregnant stage with CI 95% (75.34 – 84.72%). 185 (62.71%) with C1 95% (56.92 – 68.25%) have taken rest for > 2 hours during daytime. Regular IFA tablets were taken by 220 (74.58%) mothers with CI 95 % (69.21 – 79.45%).

Table 3: Association between low birth weight and maternal variables (n = 295)

Serial number	Maternal Variables	Number	LBW	P value
1	Age (in years) <20 to > 30 20 – 30	 82 213	 46 26	p = 0.001
2	Education Illiterate Literate	 94 201	 20 52	p = 0.5017
3	Occupation Housewife In job	 250 45	 54 18	p = .0493
4	Family Income per month <20,000 to 40,000 >40,000	 276 19	 61 11	p = 0.014
5	ANC visits Inadequate<4 Adequate > or equal to 4	 190 105	 44 28	p = 0.6020
6	Diet More than pre pregnant state Less than or same as pre pregnant state	 237 58	 35 37	p < 0.0001
7	Rest during afternoon <2 hrs >2 hrs	 110 185	 19 53	p = 0.0824
8	Period of gestation Full term Preterm	 245 50	 32 42	p <.0001
9	History of abortion Yes No	 85 210	 08 64	p = 0.002

Table 3 shows the association between maternal variables and low birth weight deliveries. To find the risk factors associated with low birth weight chi square and fisher exact test were applied for analysis. It showed Age in years (p=0.001), dietary intake (p<0.0001), family income (p=.01) period of gestation (p<0.0001) and history of abortion (p=.002) were found to be

statistically significant.

Discussion

The present study was done on 295 mothers in a secondary care center of Vidisha M.P., to assess the factors with low birth weight delivery. Proportion of L.B.W in the present study was 24.41 %. Similar result was seen in many hospital-based studies [13,10,14] 56.09% of mothers having low birth weight delivery were in the age group of <20 to >30 years. Similar result is shown by kotabal et al [11] where 57% of less than 20 years mothers had low birth weight babies. A study by Gebregzabiherher et al [15] also showed similar result. 55.31 % mothers were illiterate among the low birth weight delivery. This might be due to less awareness about utilizing health services and acquiring healthy behaviour for wellbeing. Similar finding was reported by Yadav DK et al [16] and Nobile CG et al [17]. In the present study housewives showed more LBW deliveries than on job which is in contrast to Anand et al [18] which showed 67.8% of LBW belonging to mothers who were laborer. This might be due to lack of education and awareness about self-care.

Out of 295 registered mothers the outcome was normal birth weight in those who were having equal to or more than 4 ANC visits. Low birth weight outcome was more with less than 4 ANC visits. Similar findings were seen in Anand et al [18], Roudbari M et al [19], Singh et al [20]. Tuladhar et al [21] and Yadav DK et al [16]. 56.04% mothers in the present study belong to the family with monthly income less than 20,000 rupees per month. Low socioeconomic status leads to compromised nutritional status and LBW deliveries. The results are similar to Ebrahimi et al and Hirve Ganatra BR study. [22,23]

In the present study the proportion of LBW deliveries was more among the mothers who took daytime rest for more than 2 hours which is in contrast to Bansal et al [24], Kotabal et al.[11] and Choudhary et al [10]. This might be due to the fact being mostly housewives the mothers in present study could manage to take rest for more than 2 hours.

It was observed that low birth weight was higher among mothers who didn't had history of abortion which is in contrast to Gebregzabiherher et al [15]. This might be due to wrong information or hesitation in giving correct information while data collection.84% mothers of preterm birth have low birth weight babies in the present study. Preterm birth has been reported as a dominant risk factor in many studies for LBW deliveries.[13,10,14] Low birth weight babies were born to the mothers with compromised nutritional status due calorie and protein deficiency in diet. In the present study 86.2% mothers has shown dietary deficiency. This observation is supported by Sharma S R et al. [25,26]

Conclusion

The study concluded that age, income, diet, history of abortion and period of gestation are associated factors with the occurrence of low birth weight deliveries. Thus, social as well as biological factors play important role in this context. Recommendation hence would be enhanced health education to bring about the social reform in the form maternal literacy, extending age at marriage and age at first pregnancy

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