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Original Article

Prevalence and Risk Factors of Low Birth Weight in Tertiary Level Hospital in Eastern Nepal

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Abstract

Background

The birth weight of the newborn determines of its survival, growth and development. World health organization defined low birth weight as weight at birth less than 2500 grams. Low birth weight baby dies 20 times more than normal weight baby. There are 16% of the live birth are low birth weight worldwide. The prevalence of low-birth-weight newborn in Nepal was 12%.

Materials and Methods

A cross-section study was under taken in the Nobel Medical College Teaching Hospital Biratnagar. All newborn babies delivered in the department of obstetrics and gynecology at Nobel Medical College Teaching Hospital during study period was under taken as sample size. The collected DATA were entered in software Microsoft Excel and transferred to SPSS version 27 and analysis was done.

Results

The prevalence of low birth weight was 23.3% in our study. The low birth weight was significant associated with gestational age and parity of mother. The gestational age less than 37 weeks had more low birth weight 133(58.9%). Similarly, primi parous mother had high low birth weight 146(61.3%) than multi parous mother.

Conclusion

In our study we found that the low-birth-weight baby was more common in the mother with gestational age less than 37 weeks, primi parous and Janjati ethnicity.

Keywords: Gestational age, Low birth weight, Newborn, Parity, Risk factors



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Introduction

The birth weight of a newborn is the single most determinants of its survival, growth and development. Two main groups of low-birth-weight babies are those born prematurity and fetal growth retardation [1]. Low birth weight has been defined by the World Health Organization (WHO) as weight at birth of less than 2,500 grams. This is based on epidemiological observations that newborn baby weighing less than 2,500 g are nearly about 20 times more likely to die than normal weight babies. High incidence rate of low birth weight has in Asian region followed by Africa [2].

Worldwide about 15 to 20.0% of the live births or some 20 million infants per year are low birth weight. Incidence of LBW in developing countries is more than doubled in comparison with developed countries (16.5% vs 7%) of total birth [3]. According to Nepal Demographic and Health Survey (NDHS), the prevalence of LBW in Nepal was 12% which was calculated from the available birth weight of infants [4].

There are several risk factors of low birth weight; major factors include preterm birth, intra uterine growth restriction (IUGR) or both pathological and physiological condition [5]. Low birth weight is the strongest risk factors for the morbidity and mortality of newborn babies so that our study was to find out the prevalence and risk factors of low birth weight.

Materials and Methods

A cross-section study was conducted among the mother delivered newborn babies at the Nobel Medical College Teaching Hospital, Biratnagar in the department of Obstetrics and Gynecology. All newborn babies delivered were undertaken as a sample size during the period of 25 May 2025 to 30 October 2025. Ethical approval for the study obtained from the Institutional Review Committee of Nobel Medical College Teaching Hospital Biratnagar (Reference No.30/2025). Informed consent was taken from all the participants after explaining about our study.

All the singleton newborn babies were included in the study. Multiple deliveries, congenital abnormalities and stillbirth were excluded from our study. The sample size was calculated by using the formula $n=z^2 p (1-p)/e^2$ Where, n =minimum sample size, $Z= 1.96$ at 95% confidence interval (CI), $P= 12\%$, e = allowable error 2%, $n= (1.96)^2 \times 0.12 \times 0.88 / (0.02)^2$, estimated sample size was 1015. The total sample size was 1021 in our study during the study period. The prevalence of the Low-Birth-Weight babies of

national level was 12 % according to national demography and health survey 2016 [4]. Simple random sample technique was used in this study. The data were collected by interview, pre-designed and pretested questionnaire and by reviewing the records. Height and weight of mother was measured by stadiometer and weighing scale respectively. The weight of the newborn babies was measured by baby scale. The demographic characteristics such as age, sex, education, religion, ethnicity group were obtained. Data related to gestational age, parity, gender of baby and ethnicity of mother also collected. The collected data enter in micro soft excel and transferred to SPSS version 27 and analysis was done. Both descriptive and inferential statistics were used for analysis. Frequency and percentage were used for descriptive statistics and chi-square test was applied to find associated risk factors for low-birth-weight babies.

The normal birth weight considered as the birth weight equal and greater than 2.5 kg. LBW considered as the birth weight less than 2.5 kg.

Results

Table 1: Demography characteristics of mother (n=1021)

Age groups	Frequency	Percentage
Less than 20 years	98	9.6
20 years to 35 years	878	86
Greater than 35 years	45	4.4
Total	1021	100
Ethnicity		
Brahmin	164	16.1
Chhetri	96	9.4
Janjati	561	54.9
Dalit	102	10
Muslim	83	8.1
Newar	15	1.5
Total	1021	100
Gestational age		
Less than 37 weeks	206	20.2
Equal and greater than 37 weeks	815	79.8
Total	1021	100
Parity		
Primiparous	488	47.8
Multiple parous	533	52.2
Total	1021	100

Majority of the mothers in this study were in the age group between 20 to 35 years that was 878 (86%) followed by age group less than 20 years 98 (9.6%) and greater than 35 year 45 (4.4%). With respect to ethnicity, the highest population



were Janjati 562 (54.9%) followed by Brahmin, Dalit, Chhetri, muslim and Newar. Most of the mother 815 (79.8%) were in the gestational age more than and equal to 37 weeks and 206 (20.2%) were in the gestational age less than 37 weeks. Multi parous mother were more 533 (52.2%) in compared with primi parous 488 (47.8). table 1

Table 2: Prevalence of LBW

Birth weight	Frequency	Percentage
Low birth weight	238	23.3
Normal birth weight	713	76.7
Total	1021	100

The prevalence of low-birth-weight newborn babies was 23.3 %. The low birth weight was considered the new born with weight less than 2.5 kg. The normal weight newborn babies were 76.7 % in this study. Table 2

Table 3: Low birth weight associated with different factors

Factors	Low birth weight f(%)	Normal birth weight f(%)	P value
Age group of mothers			
Less than 20 years	32 (13.4)	66 (8.4)	<0.067
20 to 35 years	195 (81.9)	683 (87.2)	
Greater than 35 years	11 (4.6)	34 (4.3)	
Gestational age			
Less than 37 weeks	133 (58.9)	73 (9.3)	<0.001
Equal and greater than 37 weeks	105 (41.1)	710 (90.7)	
Parity			
Primi parous	146 (61.3)	342 (43.7)	<0.001
Multiple parous	92 (38.7)	441 (56.3)	
Gender of baby			
Male	119 (50)	441 (56.3)	<0.05
Female	119 (50)	442 (43.7)	
Ethnicity			
Brahmin	44 (18.5)	120 (15.3)	<0.22
Chhetri	17 (7.1)	79 (10.1)	
Janjati	130 (54.6)	431 (55)	
Dalit	30 (12.6)	72 (9.2)	
Muslim	14 (5.9)	69 (8.8)	
Newar	3 (1.3)	12 (1.5)	

The low birth weight is more common in the gestational period less than 37 week 133 (58.9%) than the gestational period equal and greater than 37 weeks 105(41.1%) was significantly associated with gestational period with p value <0.001. In relation with parity of the mother, the prevalence of low-birth-weight newborn was higher in primi parous 146(61.3%) than multi

parous mother 82 (38.7%) which was significant associated with primi parous p value <0.001. The prevalence of low-birth-weight newborn babies was same in both gender male and female newborn babies. In relation with age group factor, the prevalence of low birth weight was found highest in the age group 20 to 35 years of age (81.9%) followed by age group less than 20 years (13.4%) and greater than 35 years 4.6%. The prevalence of low birth weight was found highest in Janjati but there was no significant association. Among all delivery in Dalit, more prevalence of low birth weight found in this study. Table 3

Discussion

This study was found that the prevalence of low-birth-weight newborn babies was 23.3%. The similar study done by Koirala et al in Koshi Zonal Hospital Biratnagar was found that the prevalence of low-birth-weight newborn babies was 23.1% [6]. The study was also similar finding with the study done by Thapa et al et al in Paro-pkar maternity hospital Kathmandu [7] the prevalence of low-birth-weight newborn babies was 15.3%. The prevalence was slightly lower than our study and higher than the national level, national demography and health survey 2016 12%. The study done by Bansal et al in Bharatpur [8] also found that the prevalence of low-birth-weight newborn babies was 23.6% which was also similar to this study. The study conducted by Shashikamtha et al [9] in Rohtak, India found that the prevalence of low-birth-weight newborn babies were 18 % which was slightly lower than our study and higher than prevalence of national level of Nepal.

The low-birth-weight newborn babies were more prevalent in the age group of mothers between 21 to 35 years (81.9%) in our study. The similar study conducted by Gopal G. [10] in Chennai, India also found that the prevalence of low birth newborn babies was higher in the mother age group 21 to 28 years. Other similar study done by Adugna et al in Ethiopia [11] also found that the prevalence of low-birth-weight babies were more prevalent in the age group of mother between 21 to 35 years. According to the parity of mother, the prevalence of low birth weight found to be higher in primi parous (61.3%) in our study and significantly associated with parity. The similar study done by Khanal et al [12] also suggested that primi parous had higher prevalence of low-birth-weight newborn babies. According to the study done by Koirala et al [6] had similar finding that the prevalence of low birth weight in primi parous was higher, that was 89.9%. Another similar



study conducted by kayastha et al in Kathmandu found that the prevalence of low birth weight new born babies was more in primi gravid which also suggest our study [13].

The present study found that the prevalence of low birth weight was more in the ethnicity group of janjati 54.6% followed by Brahmin (18.5%), Dalit (12.6%), Chhetri (7.1%), muslim 5.9% and newar 1.3%. The low birth weight in ethnicity group is variable with different study. The similar study done by Singh et al [14] were found that the low birth weight as followed, Brahmin 43%, chhetri 20.9%, newar 16%, mangols 12.7% and dalit 7.2%. In this study, the higher prevalence of low birth weight was found in Brahmin. Another similar study done by Chhetri et. al [15] in Chitwan also found that the prevalence of low birth weight new born higher in Janjati. The study done by Bhattarai et.al. [16] Also found that the low-birth-weight newborn was more common in Janjati.

In our study we found that the prevalence of low-birth-weight newborn babies was more in the gestational age less than 37 weeks. The similar study done by Pal et al in West Bengal State, India [17] found that the prevalence of low-birth-weight newborn babies was more in preterm delivery that is the gestational age less than 37 weeks of pregnancy which suggest our study. Another similar study done by Abdi et al [18] also found that the prevalence of low-birth-weight newborn babies was higher in the mother with the gestational age less than 37 weeks of pregnancy.

Conclusion

There were various factors associated with low-birth-weight newborn babies. The prevalence of low-birth-weight newborn babies was more common in the age group of 20 to 35 years, preterm delivery, primi porous and Janjati Ethnicity in our study.

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Conflict of interest: none

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