ORIGINAL ARTICLE

Risk Factors of Low Birth Weight in Pakistan

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ABSTRACT

Introduction: Birth weight is a reliable and sensitive indicator of a new-born's chances of long-term survival, growth, and physical and psychosocial development. There is little research in Pakistan that documents valuable data such as detailed maternal consumption data and psychological factors and links them to low birth weight. The aim was to estimate the LBW proportion and to assess the factors influencing birth weight.

Methods: This cross-sectional study was held in the community medicine department in collaboration with Obstetrics and Gynecology department of Jinnah hospital, Lahore and Darul Sehat Hospital, Karachi for the duration of six months from February 2021 to July 2021. A total of 130 patients were selected in consecutive samples, and then a questionnaire was given to them.

Results: Among 130 women, the LBW frequency was 16.9%, and the mean birth weight was 2.7 ± 0.6 kg. We also found a significant relationship between birth weight and per capita income, maternal weight gain during pregnancy, number of prenatal visits, maternal education, tobacco use and nutritional stress, and egg consumption. Multivariate analysis showed a significant relationship between maternal weight gain and birth weight during pregnancy, tobacco use, and stress.

Conclusion: More people were found to have access to basic prenatal care measures such as nutrition, free iron supplements, and regular prenatal checks, indicating a positive effect on birth weight in the study population. While several factors have been shown to be related to each other, the focus should be on psychological and nutritional factors.

Keywords: Low birth weight, Related factors, Dietetics, Psychological.

INTRODUCTION

Birth weight is a reliable and sensitive indicator of a new-born's chances of long-term survival, growth, and physical and psychosocial development[1-2]. Infants weighing less than 2,500 grams are approximately 20 times more likely to die than other infants and are closely associated with fetal and neonatal mortality and morbidity[3-4]. Low birth weight (LDA) inhibits cognitive growth and development, and is also associated with chronic disease later in life. Since birth weight is strongly correlated with infant survival, strategies to reduce the birth rate should be considered. Longitudinal studies linking low birth weight to diet, antenatal care, environmental factors and sociodemographic factors are ongoing in Pakistan. Most studies are registry-based and retrospective, so baseline data such as food intake through diet recall is missing[5-6]. This study aims to reduce the proportion of LBW in the prenatal maternal population admitted while filling the gaps in the available literature by documenting related LBW risk factors that can be prevented or corrected during pregnancy. This study was performed to estimate the LBW and document factors related to birth weight.

MATERIAL AND METHODS

This cross-sectional study was held in the community medicine department in collaboration with Obstetrics and Gynecology department of Jinnah hospital, Lahore and Darul Sehat Hospital, Karachi for the duration of six months from February 2021 to July 2021. All women admitted for delivery were invited to participate in the study. Severely ill prenatal mothers were excluded. The sample size of 130 was calculated based on the expected low birth weight of 21%. Ethical consent for the study was obtained from the Ethics Committee, and the consecutive sampling was applied on 130 women who were admitted for delivery and gave written informed consent. Subjects were given a questionnaire containing a detailed history of eating habits during pregnancy, including details of sociodemographic, prenatal, and psychological risk factors, and a review of the 24-hour diet. Birth and new-born data were recorded after birth. The data was entered and coded in Microsoft Excel and analyzed with SPSS version 20.0 for coefficients, frequency and dependence. Descriptive statistics are reported using frequencies and ratios. The chi-square test and the Pearson correlation test were used to find the relationship between LBW and various possible risk factors. A p value less than 0.05 was considered statistically significant.

RESULTS

Out of 130 subjects, 114 (87.7%) were in the age group from 20 to 30 years, with an average age of 23.41 years. The LBW frequency was 16.9%, and the mean birth weight was 2.7 ± 0.6 kg. Most of the women, i.e., 57 (43.8.4%) came from the joint families, 51 (39.2%) had higher school education, and 40 (30.8%) belonged to the class - IV of the modified socio-economic status.

Table 1: Socio demographic data

	Domain	LBW (%)	Normal BW (%)	P value
Age	<19 years	3(21.4)	11(78.6)	0.41
	20-30 years	68(59.6)	46(40.4)	
	>30 years	0(0)	2(100)	
Educational status	Uneducated	4(100)	0(0)	0.02*
	Primary school	5(62.5)	3(37.5)	
	Middle school	10(66.7)	5(33.3)	
	High school	16(31.4)	35(68.6)	
	Higher secondary	15(42.9)	20(57.1)	
	Graduation	8(38.1)	13(61.9)	
Socio economic status (Class)	4(44.4)		5(55.6)	0.00*
	15(41.7)		21(58.3)	
	17(54.8)		14(45.2)	
	34(85)		6(15)	
	12(85.7)	2(14.3)		
Family type	Nuclear	40(71.4)	16(28.6)	0.32
	Joint 30(52.6)	27(47.4)		
	Living alone	8(47.1)	9(52.9)	

Various prenatal factors believed to influence birth weight were then assessed in our research population. Of 130 patients, 139 (92.3%) reported having had at least 3 antenatal examinations during pregnancy. While 130 subjects (93.8%) had taken iron tablets for at least 100 days of pregnancy, all 130 patients reported receiving 2 doses of tetanus toxoid vaccine or a booster dose. 49 (37.7%) had anemia at some point in their current pregnancy (Table 2). Anemia was assessed on the basis of the haemoglobin level in women (<11 g).

Table 2: Showing awareness about the management among the study population

Domain		LBW (%)	Normal BW (%)	P value
Antenatal check ups	>4	55(45.8)	65(54.2)	
	<4	6(60)	4(40) 0.01*	
Total IFA consumption during pregnancy	>100 tablets	37(30.3)	85(69.7)	0.06
	<100 tablets	5(62.5)	3(37.5)	
2 TT injections or 1 Booster	Taken	40(30.8)	90(69.2)	0.19
	Not taken	0(0)	0(0)	
Anemia	Present	29(59.2)	20(40.8)	0.05
	Absent	39(48.1)	42(58.9)	
H/O any current	Yes	49(70)	21(30)	0.43
Infections	No	23(38.3)	37(61.7)	
	No	14(73.7)	5(26.3)	0.06
H/O previous LBW	Absent	72(64.9)	39(35.1)	
H/O previous abortions	Yes	25(47.2)	28(52.8)	0.08
	No	54(70.1)	23(29.9)	

We then assessed various personal factors in the study population. We found that the majority of women, 106 (81.4%), reported adequate gain (at least 9 kg) during pregnancy. Of the women, 116 (89.2%) reported adequate sleep during the night (at least 8 hours) and 57 (43.8%) reported adequate rest during the day (at least 2 hours). In our study population, only (6.9%) women reported smoking (Table 3).

Table 3: Personal Factors

Domain		LBW (%)	Normal BW (%)	P value
Sleep at night	>8 hours	51(43.9)	65(56.1)	0.05
	<8 hours	7(50)	7(50)	
Rest during day	>2 hours	17(29.8)	40(70.2)	0.43
	<2 hours	34(46.6)	39(53.4)	
Tobacco use	Present	5(55.6)	4(44.4)	0.01*
	Absent	22(18.2)	99(81.8)	
H/O Passive smoking	Present	19(51.4)	18(48.4)	0.6
	Absent	32(34.4)	61(65.6)	
H/o adequate weight gain	Present	34(32.1)	72(67.9)	0.02*
	Absent	14(58.3)	10(41.7)	

We also assessed psychological factors by documenting our self-reported history of depression, stress, and anxiety, and found that 7 (5.4%), 29 (22.3%), and 11 (8.5%) of 130 women were depressed, stressed. We let you know how we felt. or anxiety at some point in pregnancy (Table 4).

Table 4: Psychological Factors.

Domain		LBW (%)	Normal BW (%)	P value
Depression	Present Absent	4(57.1) 45(36.6)	3(42.9) 78(63.4)	0.33
Stress	Present Absent	20(68.9) 63(62.4)	9(31.1) 38(37.6)	0.04*
Anxiety	Present Absent	3(27.3) 49(41.2)	8(72.7) 70(58.8)	0.32

The 62(47.7%) women reported using a non-vegetarian diet. While 77 (59.2%) of the women consumed more food than before pregnancy, 49 (34%). (Table 5).

Table 5: Nutritional factors

Domain		LBW (%)	Normal BW (%)	P value
Diet	Veg Non veg	20(29.4) 12((19.4)	48(70.6) 50(80.6)	0.23
Amount of food consumed during pregnancy as compared to pre-pregnant state	More quantity Same quantity	35(45.5) 15(28.3)	42(54.5) 38(71.7)	0.20
Milk intake	>500 ml ≤500 ml	20(25) 35(58.3)	50(75) 25(41.7)	0.06

It was found that people with a higher per capita income give birth to children with a higher birth weight (p = 0.011). Birth weights were also higher in women who reported greater weight gain during pregnancy (p = 0.008). It was found that women who underwent more antenatal visits had a higher birth weight of children (p = 0.013). We found that as the total number of years of mother's education increased, so did birth weight (p = 0.015) (Table 6).

Table 6: Relationship with birth weight.

	Correlation coefficient	p Value
Per capita income	0.201	0.011
Weight gain	0.216	0.008
No. of ANC visits	0.220	0.013
Mother's education (in years)	0.202	0.015
Egg consumption	0.321	0.003

DISCUSSION

Low birth weight is defined as a birth weight less than 2500 g, regardless of the gestational age. It is the result of premature delivery (<37 weeks gestation) or little for the gestational age. The World Health Organization estimates that 24 million low birth weight babies are born worldwide each year[7-8]. The prevalence of low-birth-weight infants is around 5% in many developed countries and ranges between 5-30% in underdeveloped or developing countries[9-10]. There are several risk factors for the mother, placenta, and fetus for low birth weight. Some of the important maternal factors include anemia, poor pregnancy weight gain, low socioeconomic status, higher birth rates, and shorter birth intervals[11-12]. LBW has serious consequences such as perinatal asphyxia, hypothermia, infections, and jaundice, as well as long-term consequences such as slow learning, delayed cognition, and poor growth. A birth weight target of at least 2.5 kg for 90% of new-borns was one of the 12 indicators used in the health care facilities[13-14]. Since birth weight is determined mainly by the health and nutritional status of the mother, its occurrence closely reflects the health of mothers in particular and of society in general[15-16]. Out of 130 subjects, 114 (87.7%) were in the age group from 20 to 30 years, with an average age of 23.41 years. Most of the women, i.e., 57 (43.8.4%) came from the joint families, 51 (39.2%) had higher school education, and 40 (30.8%) belonged to the class - IV of the modified socio-economic status.

Various prenatal factors believed to influence birth weight were then assessed in our research population. Of 130 patients, 139 (92.3%) reported having had at least 3 antenatal examinations during pregnancy. While 130 subjects (93.8%) had taken iron tablets for at least 100 days of pregnancy, all 130 patients reported receiving 2 doses of tetanus toxoid vaccine or a booster dose. 49 (37.7%) had anemia at some point in their current pregnancy. Most of the studies conducted in rural Pakistan had a very high LBW size. However, one study in Karachi found a low birthweight prevalence rate of only 8.8%, and another West Bengal study as high as 31.3%[15-16]. According to the National Family Health Survey, India More than one in five (22%) babies born had low birth weight. We found statistically significant relationships between birth weight and per capita income, mother's weight gain during pregnancy, total number of prenatal visits, and years of mother's education. A similar study conducted at a rural hospital in Vellore, India in 2005-2008 found the incidence of LBW to be 11.81% with no significant related factors, while another study at a rural Gambia hospital in 2008 found the incidence to be 10.5 % and the relationship between hypertension disorders, antenatal hemorrhage and low birth weight[17-18]. In our study population, more people had access to basic prenatal care measures, such as nutrition, free iron supplements, and regular prenatal checks, which had a positive effect on birth weight. study population[19-20]. According to our findings, other activities such as promoting girls' education and health and nutrition education will help improve the current situation[21-24].

CONCLUSION

In our study, we found a statistically significant relationship between birth weight and factors such as income per capita, maternal weight gain during pregnancy, and e.g., antenatal care visits and maternal education (in years), tobacco consumption, and a nutritional factor such as like eating eggs, and a psychological factor like stress.

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