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DETERMINANTS OF LOW BIRTH WEIGHT IN FULL TERM PRIMIGRAVIDS.

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ABSTRACT

BACKGROUND: The low birthweight (LBW) is counted as the most crucial predictor of infant mortality, especially the deaths during initial days of life. This urges the depth knowledge of risk factors for LBW as significant for identification, recognition, awareness and providing appropriate care to all mothers. **OBJECTIVE:** To determine the frequency and risk factors of LBW fetus in full term primigravids at Peoples Medical University & Hospital (PUMHS) Nawabshah. **DESIGN:** Descriptive cross-sectional study. **PLACE OF STUDY:** This study was conducted at Obstetrics and Gynecology Department of PUMHS Nawabshah. **DURATION OF STUDY:** The duration of this study was six months. **METHODOLOGY:** After ethical approval, the study consisting of 243 patients was conducted. Detail history taken regarding, Socioeconomic-Status, Profession, History of (smoking, hypertension, alcohol-intake, pica-(Multani-mitti), anemia, diabetes-mellitus (DM) and oligohydramnios followed by special investigation for hemoglobin (Hb) and ultrasound-pelvis were done. Primigravids of all age group with full-term pregnancies irrespective of delivery mode (Normal/Operative) were included. Antenatal mothers with diagnosed cardiac disorders were excluded. **RESULTS:** The mean age was 25.56±4.73 years. Predominantly patients presented with history of hypertension in 38(15.6%) and Pica-(Multani-mitti) 36(14.8%). Gestational DM in 20(8.2%) and Smoking in 6(2.5%) of cases was recorded. The Hb ranging from a minimum of 3.50 grams per deciliter to 14.0 grams per deciliter and LBW<2500 gm in 54(22.2%) cases. **CONCLUSION:** LBW a common problem in Pakistan. Among different risk-factors BMI, Socioeconomic-Status, mother's-profession, smoking, hypertension, alcohol-intake, pica-(Multani-mitti) and gestational DM were found to be the important risk-factors contributing to LBW babies born.

KEYWORDS: - Low birth weight; Primigravida women, Infant mortality

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INTRODUCTION

The birth weight or size of newborn at the time of birth is vital indicator of the newborn's susceptibility to the risk of childhood illness and to predict the future health, growth, development, and the probabilities of survival[1]. Although LBW babies correspond to only 15.5% of global births, which measures to about approximately 20 million LBW infants born annually, out of which the most highlighting incidence is 96.5% of LBW in developing countries. It is one of the leading main cause of deaths in most of the countries among newborns where neonatal mortality rates are more pronounced. The prevalence of LBW is increasing among developing countries (16.5%), almost twice that in under and developed areas (7%)[2].

The LBW is one of the most common and leading predictors of infant mortality, surprisingly the deaths within the initially months of life are mostly because of LBW and ignorance of the determinants of LBW which may be due to maternal risk factors. The LBW is elaborated by World Health Organization (WHO) as the weight at birth of less than 2,500 grams with measurements being taken preferably within the first 24 hours of life, before significant postnatal weight loss has occurred, it contributes substantially to neonatal, infant and childhood mortality and morbidity[3]. Importantly, the crucial key contributor of maternal mortality and poor birth outcomes is anemia during pregnancy identified globally[4].

The weight of newborn reflects nutritional and health status of mother prior to conception, throughout the pregnancy and followed by the growth of fetus is affected by various factors like maternal/placental and fetal. According to WHO factors contributing to LBW at Term are (manifold these) young and old maternal age, smoking, alcohol intake, parity, multiple gestations, obese and underweight mothers, lack of proper antenatal visits, severe physical work, socioeconomic status (low maternal literacy rate, stress, low income), past history of complicated pregnancies including other pregnancy comorbidities and risk factors like hypertension, gestational diabetes, oligohydramnios, premature membrane rupture and maternal malnutrition particularly Anemia (hemoglobin <11gm/dl), is the most important determinant of LBW in developing countries[5-7].

Having proper awareness, background and depth understanding of risk factors associated with LBW is important for identification and giving proper attention to all those primigravids who are at risk. Therefore, this study will determine the factors related to LBW in full-term

primigravids at Peoples Medical Hospital Nawabshah. This study will provide great deal of application in determining the primigravids and newborns who are at risk in order to design appropriate timely measures and interventions to decrease the LBW in Pakistan.

METHODOLOGY

This descriptive cross-sectional study was conducted the Obstetrics and Gynecology department of PUMHS, Nawabshah. The ethical approval was obtained by the ethical review committee of the institution. This duration of this research was of six months (January 2020 to June 2020). The sampling method was non-Probability consecutive. The sample size calculation was done using the Raosoft software for by utilizing the proportion of (Study of Ayesha Khan reported the risk factors 20% severe anemia)[5] with 95% confidential interval (CI) and 5% margin of error, the achieved sample size was n=243.

The inclusion criteria include, all full term primigravid mothers irrespective of age and mode of delivery (normal/operative), whereas mother diagnosed with cardiac disorders during antenatal checkups were excluded. Subjects fulfilling the inclusion criteria were asked for written informed consent. After signing the consent forms, detailed history was taken regarding, Socioeconomic Status, Profession, History of (smoking, hypertension, alcohol intake, pica (Multani mitti) and anemia, gestational diabetes mellitus and oligohydramnios then special investigation for hemoglobin and ultrasound pelvis were done. All the findings were recorded on the proformas. The statistical analyses were done using Statistical Package for Social Science (SPSS) Software. The Mean and Standard Deviation (SD) was measured for quantitative variables like age. The frequency/percentages were computed for qualitative variables like Socioeconomic Status, Profession, and History of (smoking, hypertension, alcohol intake, pica (Multani mitti), anemia, gestational diabetes mellitus and oligohydramnios Effect modifier like age and outcomes were controlled by stratification using T-test. The p-value of <0.05 was taken as significant.

RESULTS

There were 243 primigravids in this research. The variable age showed vast variations, ranging from the age of 17 years to 37 years. The mean for age was 25.56±4.73 years and distribution of age is shown as Figure 1. In our study BMI ranging from a minimum of 17.30 to 34.63. The mean BMI was 23.98±3.46. The BMI distribution is mentioned in Table I. Among multiple risk factors most of the patients were housewives and of low socioeconomic status. The frequency of hypertension was observed as the most common risk factor among all primigravids. The various risk factors identified for LBW are shown as Table II. The variable hemoglobin also showed vast variation, ranging from 3.50 grams per deciliter to 14.0 grams per deciliter. The mean hemoglobin was 9.9587±2.06 grams per deciliter. The observed frequencies of Low Birth Weight<2500 gm is shown in Figure II. To highlight the importance of LBW among various risk factors stratification of LBW with BMI, Socioeconomic status, Profession and other risk factors are recorded as Table III, Table IV, Table V and Table VI.

Figure: I Age distribution among 243 full-term primigravids
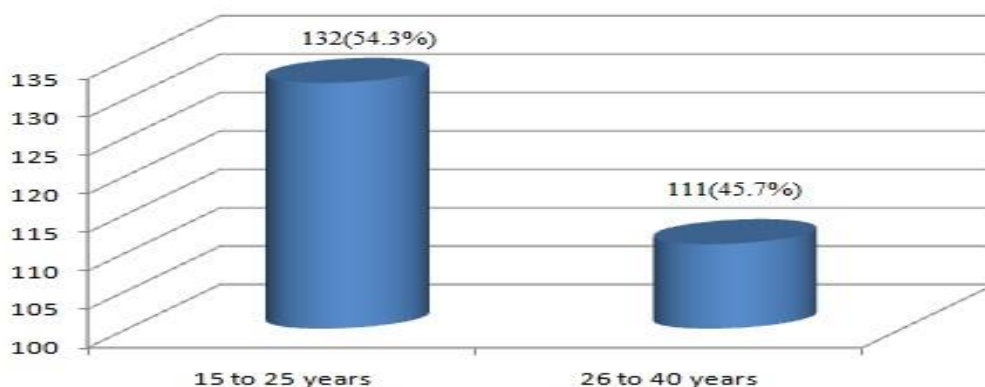
Table 1 Body Mass Index distribution in 243 full term primigravids

BMI	No. of patients (n=243)	Percentage (%)
Under-weight (<18.5)	18	7.4%
Normal weight (18.5 to 24.5)	151	62.1
Overweight (25-29.9)	54	22.2%
Obesity (30-39.9)	20	8.2%

TABLE II Frequency of risk factors of LBW in 243 primigravids

RISK FACTORS	No. of Patients (n)	Percentage (%)
Socioeconomic Status		
• Lower Class	200	82.3%
• Middle Class	29	11.9%
• Upper Class	14	5.8%
Profession		
• Housewife	210	86.4%
• Working lady	33	13.6%
History of		
• Smoking	6	2.5%
• Hypertension	38	15.6%
• Alcohol intake	4	1.6%
• Pica (Multani mitti)	36	14.8%
• Dietary restrictions	6	2.5%
• Gestational diabetes mellitus	20	8.2%
• Oligohydramnios	12	4.9%

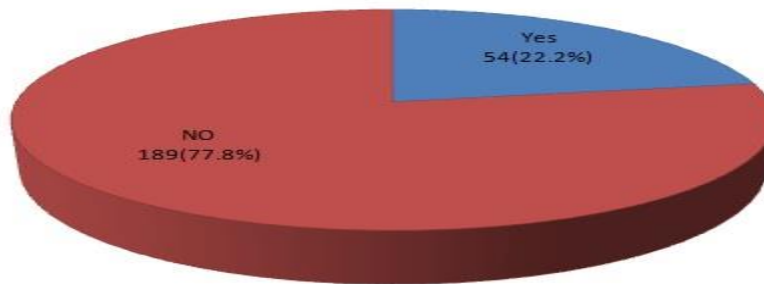**Figure II Observance of LBW in 243 full term primigravids**

(Low Birth Weight<2500 gm)

TABLE III Stratification of low birth weight according to body mass index

Low Birth Weight	BMI							
	Underweight (<18.5)		Normal weight (18.5 to 24.5)		Overweight (25-29.9)		Obesity (30-39.9)	
	Yes	%	Yes	%	Yes	%	Yes	%
• Yes	12	4.93	34	13.99	6	2.46	2	0.82
• No	6	2.46	117	48.14	48	19.75	18	7.40
p-value	<0.001							

p-value less than 0.05 is statistically significant

TABLE IV Stratification of low birth weight according to socioeconomic status

Low Birth Weight	Socioeconomic Status					
	Lower Class		Middle Class		Upper Class	
	Yes	%	Yes	%	Yes	%
• Yes	44	18.10%	6	2.46%	4	1.64%
• No	156	64.19%	23	9.46%	10	4.11%
p-value	0.830					

p-value less than 0.05 is statistically significant

TABLE V Stratification of low birth weight according to   profession

Low Birth Weight	Profession			
	Working lady		Housewife	
	Yes	%	Yes	%
• Yes	10	4.11%	44	18.10%
• No	23	9.46%	166	68.31%
p-value	0.230			

p-value less than 0.05 is statistically significant

TABLE VI Stratification of low birth weight according to history

HISTORY	Low Birth Weight				p-value
	Yes		No		
	Patients	%	Patients	%	
Smoking	6	2.5%	0	0%	<0.001
Hypertension	12	4.9%	26	10.7%	0.100
Alcohol intake	4	1.6%	0	0%	0.002
Pica (Multani mitti)	24	9.9%	12	4.9%	<0.001
Dietary restrictions	4	1.6%	2	0.8%	0.023
Gestational diabetes mellitus	0	0%	20	8.2%	0.009
Oligohydramnios	6	2.5%	6	2.5%	0.028

p-value less than 0.05 is statistically significant

DISCUSSION

The weight of newborn is related to the paternal and maternal both but, more significantly through the maternal line. Importantly the health of mother in terms of nutritional, prior and post conception care plays vital role for the fetal outcome. There are various causes for perinatal mortality but the LBW is reported as one of the most common reasons. Hence, the LBW is linked with multiple vast range of health-related issues that results in high percentages of newborn's mortality and morbidity globally.[8-11] The results showed that the youngest primigravid was of 17 years old. And surprisingly most primigravids were in the age group of 15-25 years. Studies have demonstrated that the age of mother is significant predictor for the outcome of newborn which is the size of newborn. This challenging relationship of maternal age and LBW is stated differently by most of the authors in literature. Researchers have reported that the LBW incidence was higher significantly in mothers who were of teen ages i.e., 65.52%. It is described in literature that young pregnant female is at significant risk for having LBW newborn, that highlights the important risk factor of LBW which is maternal age.[5,12-13] Moreover, in this present study 123(54.3%) of patients were belonged to age-group of 15 to25 years. And importantly, this was comparable with the study done by Ayesha Khan[5] in which it is revealed that, 82% of LBW newborns were delivered by mothers who were in age group of 20 to 30 years.

The influence of BMI on degradation of health has been the subject of many studies. The BMI can impose grave end results in pregnancy and requires serious concentration and consideration, to implement it as modified necessary care provided by medical professionals in antenatal and intra/postpartum duration. It was observed that the significant association was recorded between the weight gain (total) during pregnancy and the weight at the time of birth. The risk of having LBW is almost greater than twice for the women, those who's BMI is disturbed with respect to total weight. The researchers found similar results especially those who conducted their studies in North Ethiopia regions. This study had most of the patients (62.1%) with normal BMI. In our study observed 6(2.46%) cases low birth weight associated overweight (BMI 25-29.5) women, while 2(0.82%)

cases in obesity (BMI 30-39.9) women. However, a study reported 99 (7.4%) cases of low birth weight in overweight (BMI 25-29.5) women and 68 (6.5%) cases in obesity (BMI 30-39.9) women[14-16]. Mothers in underprivileged socioeconomic circumstances frequently deliver newborns with low birth weight. These primigravids are mostly ignored mothers who do not attain the proper ante and post-natal care hence is always at great risk of complications and adverse fetal outcomes. In families of lower SES, there is relatively high incidence of maternal malnutrition, anemia, inadequate maternal care/nutrition, drug addiction, feto-maternal complications and maternal history of reproductive inefficiency, abortions, still births, prematurity and LBW babies. In present study, 210(86.4%) patients were housewife and belongs to lower class 200 (82.3%) followed by middle 29(11.9%) and upper class 14(5.8%). While in the study of Gulnaz Iltaf, mostly patients were of poor socioeconomic 87(54.03%) status and housewife 96(59.6%). [17] During pregnancy, the fetus is entirely dependent on maternal nutrients intake and store. Thus, inadequate intake of proper balanced diet and carelessness leads to poor nutrient availability to the fetus. Moreover, maternal nutrient intakes of protein and fat have strong influence on fetal growth and birth outcome[18]. The present study yielded LBW 6(2.5%) in dietary restrictions and alcohol consumption associated LBW in 4(1.6%) and smoking associated LBW in 6(2.5%) patients. Alcohol consumption during pregnancy is a significant social problem that may be associated with adverse perinatal outcomes such as low birth weight (LBW), small for gestational age (SGA) or preterm newborns.[19] These results were supported by a study which has reported that LBW was observed in 17 (5%) of cases due to poor nutritional status[20]. The prevention

of LBW baby requires proper knowledge regarding the identification of risk factors (age, parity, birth intervals, poor previous obstetric history) and hence, avoidance of teenage pregnancy, providing extra supplementary food during pregnancy to mothers, monitoring antenatal complications, right awareness through proper health education about reproductive health is essential to prevent low birth weight babies[21].

CONCLUSION

None of us can deny that there is a notifiable number of women who are at high risk for LBW. The risk factors like low socio-economic status, maternal anemia/BMI and various other factors are significantly associated with LBW. Alarmingly, the prevalence of LBW is a common problem in Pakistan. This study is emphasizing on most common factors associated with LBW and highlighting the lack of reproductive education especially among woman. To bring dramatic decline in the incidence of LBW in primigravids, it is crucially important to consider overall health care of pregnant woman like proper antenatal visits during pregnancy, healthy diet, controlled hypertension and gestational diabetes mellitus and proper counselling to stop alcohol, smoking, pica (multani-mitti) should be made compulsory for every pregnant woman provided by health care professionals. In order to overcome this often overlooked and challenging problem, the women of special under-developed regions should be given high priority whenever it is the health-related concerns. The governmental/non-governmental groups and organizations working on maternal and child health should concentrate on identified factors in order to deal with the problem of LBW and decrease the frequency of LBW and burden of perinatal mortality from the community.

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