Original Article

Low birth weight and associated risk factors in neonates

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Objective: To determine if there are any maternal factors that might be linked to low birth weight (LBW).

Methodology: This cross-sectional study was done at Al-Batool Teaching Hospital from January and March 2022 with 150 mothers who gave birth to babies who lived. Within 24 hours of being born, all babies were weighed. A birth weight of less than 2500 grams was thought to be low. All mothers were interviewed within 24 to 72 hours of giving birth, and the results were recorded.

Results: There was significant differences ($p < 0.05$) among socio demographic characteristics of mothers, except residence. There were significant differences ($p < 0.05$) among maternal risk factors, except infant's sex. There were significant differences ($p < 0.05$) among disorders that associated with mothers.

Conclusion: In Diyala province, LBW is linked to maternal socioeconomic status, risk factors, and disorders. Antenatal visits by well-educated and well-off women may decrease LBW.

Keywords: Low birth, weight, maternal factors, neonate.

INTRODUCTION

At term, a baby's weight is based on how long it has been in the womb and how fast it has grown. When babies are born too early, they may be healthy for their gestational age, but they are too small. Babies who are too small for their gestational age can be born early or on time. When a baby's birth weight for their gender falls below the 10th percentile for their gestational age, they are said to be small for their gestational age. More than 70% of these Low Birth Weight (LBW) babies are small because of their genes and their environments.[1]

LBW is one of the most important things that can make a baby sick or even kill them. When a fetus is small for its gestational age, it's important to find out if it's because of intrauterine growth restriction (IUGR), being born early, or something else in the baby's DNA. Traditionally, a baby born alive who weighs less than 2500 grams was considered preterm. However, clinical experience has shown that many of these babies were actually full-term.

In 1967, WHO acknowledged this by calling babies who weighed less than 2500 g at birth "low birth weight."[2] LBW can also lead to growth disorders, problems with cognitive development, and chronic diseases later in life. Adults who were born with LBW are more likely to have heart disease, stroke, high blood pressure, and diabetes than those who were born with a normal birth weight (NBW).[3]

LBW can happen to both young and older moms. Younger moms have problems like low socioeconomic status, low education, poor nutrition, and a low body mass index. Older moms, on the other hand, have problems like chromosomal abnormalities, preeclampsia, and diabetes.[4] There are a lot of studies about the risk factors for LBW in developed countries, but there aren't as many about developing countries. The aim of this study was to determine if there are any maternal factors that might be linked to LBW.

METHODOLOGY

This cross-sectional study was done in the pediatrics department at Al Batool Teaching Hospital from January to March 2022 with 150 mothers who had babies who lived. Ethics Committee reviewed and approved the research protocol and consent form (document 145 date 6/4/2022).

The babies born in hospitals during the study period were the study population. All of the mothers were asked between 24 and 72 hours after giving birth, and the answers were written down. All of the mothers who gave birth to live babies at the study site were used as a sample for the study. Data collected involved the maternal age, maternal height, maternal weight (pregnancy and during pregnancy), maternal hemoglobin, educational status, occupational status, residence, sex of infant, gestational age, number of pregnancies, number of ANC visits, iron intake during pregnancy, any illness during pregnancy, bleeding in the third trimester, time between pregnancies, and previous low birth weight. History of abortion and history of smoking were recorded.

Statistical Analysis: We used SPSS version 24.

Pearson-Chi-square test or the two-tailed Fisher exact probability test was used to see if there were any significant differences between the frequencies. P<0.05 was considered significant.

RESULTS

The study showed significant differences (p<0.05) among socio demographic characteristics of mothers, except residence character. The mothers scored highest percentage as following; 20-34 years (60.0%), tall mothers (44.7%), >50 kg in pre-pregnancy (69.3%) and during pregnancy (80.0%), no educational (38.7%), no employers (72.7%), and <2 times of inter-pregnancy interval (70.7%) (Table 1).

Maternal risk factors are shown in Table 2.There were significant differences (p<0.05) among disorders that associated with mothers. The disorders that associated with mothers scored highest percentage as following; <12 mother hemoglobin (62.7%), take iron during pregnancy (68.7%), take drugs during pregnancy (64.0%), and no diseases during pregnancy (68.0%) (Table 3).

DISCUSSION

This study found the risk factors for LBW, which is important for taking quick, effective, and long-term steps to improve the health of mothers and the outcomes of pregnancies.[5] We identified potential determinants of the prevalence of LBW in Diyala province and found that advanced maternal age (>19 to 49 years), lack of ANC, prim parity, illiteracy, later conception, and being in the poorest socioeconomic stratum were significantly associated with LBW. Previous studies came to the same conclusions.[6] The present investigation showed that inadequate ANC intake was a significant contributor to LBW. Women who did not get the necessary number of ANC visits were more likely to have LBW.[7]

Table 1: Mothers by socio demographic characteristics.

		Count	Percent	P value
Maternal Age (years)	>19	24	16.0%	P<0.001***
	20-34	90	60.0%	
	35-49	36	24.0%	
Maternal height (cm)	Short	34	22.7%	P<0.001***
	Average	49	32.7%	
	Tall	67	44.7%	
Maternal weight pre-pregnancy (Kg)	>50	104	69.3%	P<0.05*
	<50	46	30.7%	
Maternal weight during pregnancy (Kg)	>50	120	80.0%	P<0.001***
	<50	30	20.0%	
Mothers educational	No	58	38.7%	P<0.05*
	Primary	55	36.7%	
	High	37	24.7%	
Mothers occupational	Employers	41	27.3%	P<0.001***
	No employers	109	72.7%	
Residence	Rural	69	46.0%	P>0.05
	Urban	81	54.0%	
Inter-pregnancy interval	>2	44	29.3%	P<0.001***
	<2	106	70.7%	

Table 2: Maternal risk factors.

		Count	Percent	P value
Sex of infants	Male	69	46.0%	P>0.05
	Female	81	54.0%	
Gestation age (weeks)	>37	57	38.0%	P<0.05*
	<37	93	62.0%	
Parity	First	20	13.3%	P<0.001***
	2-3	76	50.7%	
	>3	54	36.0%	
ANC visit	1	37	24.7%	P<0.05*
	2-3	41	27.3%	
	>3	72	48.0%	
Third trimester bleeding	Yes	38	25.3%	P<0.001***
	No	112	74.7%	
Previous low birth weight	Yes	56	37.3%	P<0.05*
	No	94	62.7%	
History of abortion	Yes	57	38.0%	P<0.05*
	No	93	62.0%	
History of smoking	Yes	32	21.3%	P<0.001***
	No	118	78.7%	

Similar findings have also been noted in earlier research carried out in underdeveloped nations.[8] LBW was more likely to happen to women who lived in rural areas. Similar results have been found in other studies.[6] Lin-Lin-Dal found that there was a U-shaped relationship between the number of prenatal visits and LBW.[9,10] This study found that some social and economic factors cause babies to be smaller than they should be. This finding goes against what an Indian study which found that moms who lived in rural areas were more likely to have babies with LBW.[11]We found that women with "no education" were most likely to have a baby with LBW, followed by women with "basic education."

These results were similar to what had been found before.[12,13]

Our results showed that mothers who did not work were more likely to have an LBW than mothers who worked. These results didn't match with the results of a previous study.[1] In our study, we found that women who were 150 cm tall had a much higher chance of having a baby who was LBW. In India, the United Kingdom, and Ethiopia, the cut-off points were 145 cm, 155 cm, and 156 cm, respectively.[14] Our results are similar to those of Mahumud et al.[6]

On average, a boy is 150 g heavier than a girl at birth. This difference in weight starts to show up after 28 weeks of pregnancy. Androgens are thought to cause differences in maternal fetal antigen, which is genetic material on the Y chromosome that contains genetic information for fetal development.[15] Extremely preterm infants with a gestational age (GA) of less than 28 weeks and extremely low birth weight infants (ELBWIs) with a birth weight (BW) of less than 1000 g have the highest death rates, and survival is uncertain.[16]

Maternal stress and anxiety, specifically related to health concerns, can also contribute to low birth weight. An Indian study found that moms who had any kind of health problem during pregnancy were twice as likely to have babies with low birth weight.[18] Moms who had babies two years or less apart were more likely to have babies with LBW.[17,18]

When a mother smokes, the average birth weight drops by 150 to 200 g and the chance of LBW goes up because the uterus can't grow as much. In contrast, only 5% of women in the current study said they had smoked

Table 3: Disorders associated with mothers.

		Count	Percent	P value
Mother hemoglobin (mg/dl)	<12	94	62.7%	P<0.05*
	>12	56	37.3%	
Take iron during pregnancy	Take	103	68.7%	P<0.05*
	No take	47	31.3%	
Take any drug during pregnancy	Take	96	64.0%	P<0.05*
	No take	54	36.0%	
Any diseases during pregnancy	DM	9	6.0%	P<0.001***
	Hypertension	12	8.0%	
	Hypertension and DM	17	11.3%	
	Other diseases	10	6.7%	
	No	102	68.0%	

in the past.[19] There is a strong link between anemia in the mother and LBW babies.[20] Khan et al,[1] found that the risk of LBW babies was 1.9 times higher in anemic populations in Pakistan.

CONCLUSION

Socioeconomic status of the mother, the mother's risk factors, and the mother's disorders are important factors in LBW in Diyala province. To improve the birth weight of babies, these key mediating factors need to be considered, and public health interventions need to be made to improve these factors.

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