

Term Lowbirth Weight Neonate: Maternal Factors

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Abstract

The current research aims to detect the maternal risk factors that influence the birth weight of the babies. Risk factors related to the mothers like gestational age, maternal age, nutrition, and medical problems play a role in the delivery of infants with low birth weight. The sample consisted of 267 ladies give a birth to newborns. Mothers with less than or = 150cm giving low birth weight babies (62.3%) while those with more than 150cm giving low birth weight babies (37.7%) . In the normal birth weight group, working mothers represent (82.1%) while in normal birth weight group they represent (17.4%). Mothers more than or = 35 years old giving (33.1%) normal birth weight babies. Young mothers less than 20 years old gave more low birth weight babies (28.7%) than older mothers with more 20 years old.

The maternal risk factors of low birth weight babies include maternal age < 20 years old, low maternal educational level, working mothers, smoking, pre-pregnancy weight<50kg, maternal height ≤150cm, low socioeconomic status, inter pregnancy interval of less than one year, previous low birth weight babies, history of infertility and first week neonatal death, low rate of visiting to antenatal care centers.

Keywords: *Low birth weight, risk factors, antenatal care, fetal growth.*

Introduction

According to the WHO, low birth weight (LBW) is defined as the weight at birth of less than 2.5 kg whatever the gestational age¹. While, very LBW (VLBW) is the infant weight < 1.5 kg, and extremely LBW (ELBW), the infant <1kg.²

LBW is considered a major health concern all over the world, particularly in developing countries. Around 25 million LBW infants are born per year, and 20 % of them die globally¹.

Infants who weigh less than 2,499 gm at birth are at twenty times more risk of neonatal death than those who weigh more than 2,500 gm³.

The prevalence of low birth weight in in developed regions (7%) while in developing countries (16.5%)⁴.

There are many risk factors of LBW in developing countries include the age of the mother, maternal education, attendance of the antenatal care (ANC) follow-up, socioeconomic status, and maternal body mass index⁵.

In general, LBW is due to genetic, nutritional, obstetric, constitutional, prenatal maternal morbidities, drugs and toxins exposure, and ANC follow-up. In addition, other risk factors have also been reported like age of the mother, smoking, birth spacing, genital infections, anemia, stress, and ill health mothers⁶.

The aim of the study was to find the maternal risk factors for LBW in full term babies.

Materials and Method

This is a prospective cohort study that was carried out during the period from the 1st of March 2019 till the 1st of July 2019 that involving 267 ladies delivered at AL-Khansaa and Ibn-Alatheer Maternity and Children Teaching Hospitals in Mosulcity/Iraq.

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Data were collected through a special questionnaire regarding mothers age, address, education, smoking habit, history of abortion or infertility, residency (rural or urban), antenatal care visit with the number of these visits, any supplementation of tonics, any ante-partum complication have been evaluated and the informed consent was taken from every mother. Newborn babies were examine for gender and presence of congenital anomalies. Gestational age was determined were the full term babies (³37 weeks of gestation) and the birth weight was measured immediately after delivery.

The newborns divided into two groups, a case group with LBW <2.5 kg and a control group with normal birth weight (NBW) of ≥2.5 kg.

- **Inclusion Criteria:** All live babies born at term-gestational age.

- **Exclusion Criteria:** Intra-uterine deaths, still-births, and twins deliveries.

The results were analyzed using Chi-squared method, where P-Value is not significant if it is > 0.05, significant if < 0.05, and highly significant if < 0.001.

Results

Out of 267 term babies, there are 166 (62.5%) with normal birth weight, and 101 (37.5%) with LBW.

Table (1) shows that a mothers where maternal age < 20 years, low maternal educational level, working mothers, smoking habit, low socioeconomic status associated with significant relation with LBW.

Table (1) Socio-demographic characteristics of 267 mothers

Age of mother		LBW		NBW		p-value
		No.	%	No.	%	
<20 years	47	29	61.7	18	38.3	<0.001
20-24 years	51	25	49.1	26	50.9	
25-29 years	43	21	48.8	22	51.2	
30-34 years	60	15	25	45	75	
≥ 35 years	66	11	16.6	55	83.3	
Total	267	101	37.8	166	62.2	
Residence						>0.05
Rural	107	39	36.4	68	63.6	
Urban	160	62	38.7	98	61.3	
Total	267	101	37.8	166	62.2	
Level of education of mother						<0.001
Illiterate	54	43	79.7	11	20.3	
Primary	50	33	66	17	34	
Intermediary	36	13	36.1	23	63.9	
Secondary	59	7	11.9	52	88.1	
University & above	68	5	7.4	63	92.6	
Total	267	101	37.8	166	62.2	
Employment-status						<0.001
Worker	112	83	74.1	29	25.9	
House-wives	155	11.6	17.9	137	88.4	
Total	267	101	37.8	166	62.2	

Age of mother		LBW		NBW		p-value
		No.	%	No.	%	
Smoking habit						<0.001
Non- smoker	112	16	14.3	96	85.7	
Passive smoker	82	36	43.9	46	56.1	
Current Smoker	73	49	67.1	24	32.9	
Total	267	101	37.8	166	62.2	
Socioeconomic status						<0.001
High	108	15	14.9	93	56	
Moderate	66	21	20.8	45	27.1	
Low	93	65	64.3	28	16.9	
Total	267	101	37.8	166	62.2	

As shown in **table (2)**, pre-delivery weight (less than 50k.g.), maternal height (≤ 150 cm) and short-spacing (< 1 year) associated with significant relation with LBW.

Table (2) Clinical aspects related to mothers

Pre-pregnancy weight		LBW		NBW		p-value
		No.	%	No.	%	
<50kg	47	29	61.7	18	38.3	<0.001
50-89kg	149	51	34.2	98	65.8	
≥ 90 kg	71	21	29.6	50	70.4	
Total	267	101	37.8	166	62.2	
Maternal height cm						<0.001
≤ 150	95	63	66.3	32	33.7	
> 150	172	38	22.1	134	77.9	
Total	267	101	37.8	166	62.2	
Parity						<0.005
Prime	110	52	51.5	58	35	
2-3	73	28	38.4	45	61.6	
>3	84	21	25	63	75	
Total	267	101	37.8	166	62.2	
Spacing(years)						<0.001
< 1	31	26	46.4	5	7.0	
1	25	14	25	11	15.5	
2	34	11	19.6	23	32.4	
≥ 3	37	5	9.0	32	45.1	
Total	127	56	44.1	71	55.9	

Table (3) Distribution of the birth weight according to the mothers previous obstetrical history

Previous obstetrical history		LBW		NBW		p-value
		No.	%	No.	%	
1	History of previous LBW deliveries*					<0.001
	Yes	28	68.3	45	40.1	
	No	13	31.7	67	59.9	
	Total	41	26.6	112	37.4	
2	History of stillbirth*					<0.001
	Yes	37	77.1	26	24.8	
	No	11	22.9	79	75.2	
	Total	48	31.4	105	68.6	
3	History of 1st week neonatal death*					<0.001
	Yes	31	57.4	21	21.2	
	No	23	42.6	78	78.8	
	Total	54	35.3	99	64.7	
4	History of infertility					<0.001
	Yes	62	61.4	45	27.1	
	No	39	38.6	121	72.9	
	Total	101	37.8	166	62.2	
5	History of abortion					>0.05
	Yes	21	20.8	44	26.5	
	No	80	79.2	122	73.5	
	Total	101	37.8	166	62.2	

*After exclusion of primiparous (114) from total number (267), the remain number (153).

As shown in **table (3)**, mothers who had delivered LBW babies previously, (68.3%) gave birth to LBW babies again. The risk of giving birth to LBW babies significantly increased in mothers with history of still birth (77.1%), previous history of first week neonatal death (57.4%) and history of infertility (61.4%).

Table (4) Distribution of the birth weight according to the mother attendance to antenatal care centers

ANC attendance		LBW		NBW		p-value
		No.	%	No.	%	
1	Antenatal care					≤0.001
	Absent	26	25.8	24	14.5	
	Present	75	74.2	142	85.5	
	Total	101	37.8	166	62.2	
2	Number of visits					<0.001
	1-3	35	46.7	11	7.7	
	4-6	21	28.0	51	35.7	
	≥ 7	19	25.3	81	56.6	
	Total	75	31.9	143	68.1	

ANC attendance		LBW		NBW		p-value
		No.	%	No.	%	
3	Date of 1 st visit					<0.005
	1 st trimester	15	20.0	59	41.3	
	2 nd trimester	26	34.7	44	30.8	
	3 rd trimester	34	45.3	40	27.9	
	Total	75	31.9	143	68.1	
4	Iron-folate supplementation					<0.005
	No	58	77.3	58	40.6	
	Yes	17	22.7	85	59.4	
	Total	75	31.9	143	68.1	

As shown in **table (4)**. Significant association was found between the number of visits to ANC center and giving LBW-babies. The mothers who was not received iron-folate supplementation were significantly at higher risk of giving LBW babies.

Discussion

In this study a significant association was observed between the age and fetal growth were mothers less than 20 years old gave birth to a LBW babies. Similar finding was observed by Althabe et al study⁷. This could be explained by the fact that such teenagers have not completed their physical growth and the additional caloric requirement of the pregnancy may create a competition between the mother and the fetus for nutrients.

human health may be effected by environmental exposures but no significant association was found between residence and fetal growth. This is in agreement with the study of Dimple⁸.

The present study showed that as the maternal educational level increases, the chance of delivering LBW neonate decreases, the same result was reported in Pakistan⁹.

working mothers were more prone to deliver LBW neonates, this is partially may explained by the lack of the time needed for mother to rest and that exercise during work may reduce blood flow from the uterus to the placenta. This result coincides with study carried out in Tehran which illustrate that LBW among employed mothers was 5 times more likely than unemployed ones¹⁰.

In our study, there is a significant association between cigarette smoking and delivering LBW neonate. This finding was consistent with the finding reported byZheng et al¹¹.

Maternal pre-pregnancy weight status has an important rule on fetal growth and the ability of the placenta to supply essential nutrients to the fetus depends on the nutritional status of the mother¹². This study show that women with low pre-pregnancy weight (<50 k.g) were more prone to deliver small babies. the same result was reported byZ. He et al¹³.

Maternal height also revealed significant association with LBW babies, women whose height were less than or = 150cm appeared to be significantly at higher risk of having LBW-babies. This might be explained by genetic susceptibility. This result was in accordance with the finding in study in 2015 in Nepal¹⁴.

The LBW babies were more likely to be the first born baby. This might be explained by the fact that multiparous women know more about how to deal with their pregnancy. This finding was similar to that found byRosy et al¹⁵.

Result demonstrated that those mothers with low SES were more prone to delivering LBW neonate when compared with high SES mothers. The logic explanation for this finding is that mothers with low SES may not attended health care and with poor nutrition. This result supports that reported by Rosy et al¹⁵.

This study showed that there was a significant association between short spacing and LBW babies. This might be due to nutritional deprivation and incomplete

return of the maternal physiology to normal levels encountered among rapid conceivers. similar finding were reported by other studies in India¹⁶.

Mother with history of previous LBW delivery are more likely to having LBW neonates in subsequent pregnancy. This finding was also obtained by Mvunta et al¹⁷. The explanation of this finding may be due to the persistence of socio-demographic factors like age, poor nutritional and social status.

The study also clarified a significant risk of LBW in pregnancy preceded by history of stillbirth or first week neonatal death. This finding was compatible to that found by Feresu¹⁸.

Compared with infants conceived within 12 months of trying, those conceived after a waiting time of 12 months have a higher risk of preterm birth and LBW¹⁹. Mothers with history of infertility were more prone to deliver LBW-babies. This finding was in agreement with the study of Wannous et al in Syria²⁰.

Regarding previous history of abortion, no significant association was found with LBW babies, this finding support the finding detected in Syria²⁰.

Prenatal care considered an important tools available to detect obstetric risk factors that may impact on optimal fetal development, and final birth weight²¹. Mothers with no antenatal care, were more prone to deliver LBW babies this was in agreement with that found by Howlader²².

The prevalence of LBW significantly affected by micronutrient deficiencies during pregnancy, particularly iron and folate²³. This study detected that nutritional supplementation with iron and folate during pregnancy was associated with reducing the risk of giving LBW neonate. This finding was in agreement with that observed by Howlader²².

Conclusion

The study showed the maternal risk factors for LBW neonates were maternal age 20 years, low maternal educational level, working mothers, smoking habit, pre-delivery weight (less than 50 kg), maternal height (≤ 150 cm), low socioeconomic status and short-spacing (1 year), less frequent and late visits to ANC-centers and with no supplementation of iron and folate. Previous bad obstetrical history is a probable risk factor.

Conflict of Interest:

Source of Funding: Self

Ethical Clearance: Not required

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