



The Prevalence of Low Birth Weight and Its Correlation with Antenatal Care and Parental Smoking in Babylon Province

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انتشار انخفاض الوزن عند الولادة وارتباطه برعاية الحوامل وتدخين الوالدين في محافظة بابل

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ABSTRACT

Across sectional study was applied in Babylon teaching hospital for obstetric and children over six months period from April 2020 to September 2020 the study was done on 754 full term live birth neonate The birth wight and gestational age was taken for all newborn. The gestational age was calculated by last menstrual period and ultrasound examination and a new Ballard score. Full term is considered when the gestational age is ≥ 37 weeks

Premature and infants with birth defects were excluded from the study

Questionnaire was taken from mother whither attend ANC (antenatal care) or not and whither mother and father are smoker or not.

The total number of low births weight was 69 from the total number full term which are 754 with a percentage of 9.2% and the number of large gestational age is 22 with a percentage of 2.9% . there is significant relationship between antenatal care and low birth weight with P-value <0.001 and also significant relationship between maternal smoking during pregnancy and low birth weight with P-value <0.001 . but there is no relationship with paternal smoking.

Key words:

Low Birth Weight, Smoking, maternal smoking, antenatal care, Paternal smoking.

الخلاصة

**مقدمة:**

يعتبر انخفاض الوزن عند الولادة مصدر قلق خطير للصحة العامة في البلدان المنخفضة ومتوسطة الدخل. في العراق وجدت دراسة أن 276 (51.8 في المائة) من الأطفال حديثي الولادة ولدوا بوزن منخفض عند الولادة. على الصعيد العالمي ، وُلد 20 مليون طفل ، أي ما يقدر بنحو 15% إلى 20% من الأطفال بوزن منخفض عند الولادة ، و 13% منهم في أفريقيا جنوب الصحراء الكبرى. على الرغم من أن منظمة الصحة العالمية توجهت إلى تقليل انخفاض الوزن عند الولادة بنسبة 30% بحلول نهاية عام 2025 ، إلا أنه ما تم العمل به كان ضعيفا من أجل تقليل نسبة انخفاض الوزن عند الولادة.

طرق العمل:

تم تطبيق الدراسة المقطعية في مستشفى بابل التعليمي للولادة والأطفال على مدى ستة أشهر من أبريل 2020 إلى سبتمبر 2020 ، وأجريت الدراسة على 754 مولود حي كامل المدة.

تم أخذ وزن الولادة ومدة الحمل لجميع الأطفال حديثي الولادة و تم أيضا حساب عمر الحمل حسب آخر دورة شهرية وفحص الموجات فوق الصوتية و درجة بالارد جديدة. يتم أخذ المدة الكاملة في الاعتبار عندما يكون عمر الحمل 37 أسبوعًا. الخدج والرضع الذين يعانون من عيوب خلقية تم استبعادهم من الدراسة. تم عمل استبيان للأم فيما إذا كانت تحضر رعاية ما قبل الولادة أو لا ، و كون الأم والأب مدخنين أم لا.

تم تحليل البيانات باستخدام SPSS الإصدار 22.0. تم تطبيق نسبة الأرجحية المعدلة (AOR) بفاصل ثقة 95 % (CI) في نماذج الانحدار اللوجستي متعدد المتغيرات ، واعتبرت قيمة p أقل من 0.05 ذات دلالة إحصائية.

الاستنتاجات:

- بلغ إجمالي وزن المواليد المنخفضي الوزن 69 من العدد الإجمالي للمدة الكاملة 754 بنسبة 9.2% وعدد كبير عمر الحمل 22 بنسبة 2.9%. توجد علاقة ذات دلالة إحصائية بين الرعاية السابقة للولادة وانخفاض الوزن عند الولادة بقيمة $P < 0.001$ وأيضًا علاقة ذات دلالة إحصائية بين تدخين الأم أثناء الحمل وانخفاض الوزن عند الولادة بقيمة $P < 0.001$. لكن لا علاقة له بتدخين الأب..

الكلمات المفتاحية:

نقص الوزن عند الولادة ، التدخين ، رعاية ما قبل الولادة ، تدخين الأم ، تدخين الأب.

INTRODUCTION



(LBW) The medical definition of low birth weight is a baby who weighed less than 2,500 grams - or 5 pounds 5 ounces - at birth. (1)

As well as the World Health Assembly targeting a 30% reduction in LBW by the end of 2025, little is done that is known about LBW. (2)

Epidemiology

Low birth weight reports from UNICEF and the World Health Organization indicate that one in seven live births (20.5 million children globally) had low birth weight in 2015, almost half of the number in South Asia. Reports indicate a lack of progress in reducing the prevalence of low birth weight between 2000 and 2015, with a slower annual rate of progress in the period 2010-2015 compared to the period 2000-2009. Of the 20.5 million babies with low birth weight in 2015.

In fact, South Asia accounted for nearly half of the world's low-birth-weight newborns. Africa was home to most of those born in East and West Africa about a quarter of all low birth weight babies. Progress in reducing low birth weight has been limited across all regions and subregions, both in terms of disease prevalence and number of children affected. There was no change at all in the prevalence of low birth weight between 2000 and 2015 in Latin America and the Caribbean and in the more developed regions. In fact, in general, no region or subregion showed statistically significant changes in prevalence or the numbers affected during this 15-year period (6)..

Causes of low birth weight:

The main reasons for the birth of young children are:

Premature birth or they were born at the correct time but did not develop enough during pregnancy (called intrauterine growth restriction, or IUGR). There are many reasons for low birth weight, and these reasons include the premature baby, preeclampsia, or problems related to pregnancy, as well as smoking and drug addiction, too many births, in addition to the birth of (twins or more), unhealthy food during pregnancy, and infection in the mother or child Before birth, including cytomegalovirus (CMV), toxoplasmosis, chickenpox and rubella. (1)

Women exposed to violence (physical, sexual, or emotional) during pregnancy have an increased risk of having a low birth weight baby (7).

Polluted environment such as smoking (including maternal exposure to secondhand smoke) and exposure to lead and other types of air pollutants (8).

Intrauterine growth restriction:



Reports indicate that intrauterine growth restriction (IUGR) leads to poor fetal growth when present in the mother's womb during pregnancy. There are many causes, but most often they involve the unhealthy diet of the mother or the lack of adequate oxygen supply to the fetus.

Intrauterine growth restriction causes the baby to be small for gestational age, which is defined as a weight less than the 10th percentile for gestational age(9)

Antenatal care:

Antenatal care (ANC) for pregnant women by health professionals improves a woman's health during pregnancy and delivers good pregnancy outcomes by identifying and controlling pregnancy-related complications. The World Health Organization (WHO) has recommended that all women with an uncomplicated pregnancy have up to four antenatal care visits during pregnancy. The World Health Organization recommends tetanus toxoid vaccines, intermittent preventive treatment for malaria, deworming, vitamins, iron and folic acid, and insecticide-treated bed nets (10)

ANC has been found to protect maternal and fetus health, avoid the problems during pregnancy avoid the problems during pregnancy and applying useful measures, resolve the mother's complaints, makes the mother ready for childbirth, and encourage mothers healthy behaviors. (11)

The early complications of LBW:

Breathing problems (Infant Respiratory Distress Syndrome), Bleeding in the brain (Intraventricular Haemorrhage), Patent ductus arteriosus (PDA), Necrotizing enterocolitis, Retinopathy of prematurity, Jaundice, Infections, Hypoglycemia, Hypocalcemia, Hypothermia, Polycythemia, Persistent pulmonary hypertension, Pulmonary haemorrhage, Bronchopulmonary dysplasia (BPD) (12).

In the childhood years, about 10% of children born SGA do not achieve catch-up growth after the second year of life and remain short during childhood, adolescence and adulthood (13) (14).

Many other conditions have been identified such as an increased risk of T2D and IR (15) (16) (17) .

Materials and Methods



Patients and method: across sectional study was conducted in Babylon teaching hospital for obstetric and children over six months period from April 2020 to September 2020 the study was then on 754 full term live birth neonate

The birth weight and gestational age was taken for all newborn. The gestational age was calculated by last menstrual period and ultrasound examination and a new Ballard score.

Good antenatal care was considered when the mother had card which was registered in a primary health center for follow up her during pregnancy. The following information is identified in the card: regular visit to the health center measurement of mother body wight during first, second and third trimester, blood pressure, vaccination, investigation hemoglobin and urine exam.

Any mother who not had card considered bad antenatal care. Also questioner was taken about mother and father smoking. the ethical consent was taken from couples of the neonates. The data were analyzed using SPSS Version 22.0. and p value less than 0.05 was considered as statistical significant.

Results and Discussion

The total number of LBW are 69 with percentage of 9,2%, while the large for gestational age are 22 (2.9%) as in table one.

Table 1: The total number of low birth weight

Type of birth wight	number	Percentage
Low birth wight	69	9.2%
Normal birth wight	663	87.9
Large for gestational age	22	2.9
total	754	100%

Figure 1 shows classification of newborn babies depending on birth weight including (low birth weight (1000-2000 gram), low birth weight (2100-2400 gram), normal birth weight (2500-4000 gram) and large for gestational age (> 4000 gram)). Low birth weight (1000-2000 gram) represents 2.9 % of the study's sample: 22 newborn, LBW. (2100-2400 gram) represent (6.3%) of study sample (47 babies), normal birth weight represents (87.9%) of study sample (663 babies) and large for gestational age represent (2.9%) of study sample (22 babies).

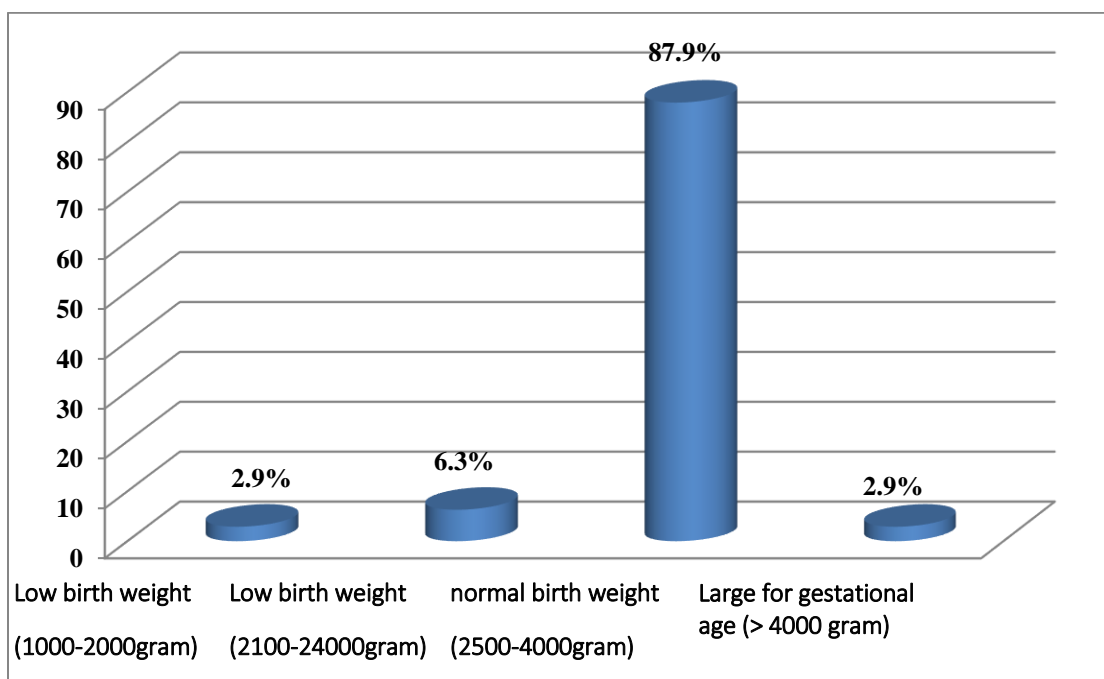


Figure 1 the distribution of new-born babies According to Birth Weight

* Mean birth weight of study sample was (2972.02 ± 478.90) gram with range of (1500-4900) gram.

The number of pregnant women with good antenatal care are 25 (36.2%), while those with bad antenatal care are 44 (31%) with significant difference (P-value <0.001).

The number of pregnant women with smoking habit are 2 (2.9%), with passive smoking are 8 (11.6%), while those who are non-smokers are 59 (85.5%), The difference is also significant (0.002* f)

The number of new-born's father who are smoker are 19 (27.5%), while those who are non-smokers are 50 (72.5%), the difference is not significant (P-value 0.988) as in table 2.



Table 2: The association between birth weight and study variables (N=732)

Study variables	Birth weight		Total	X ²	P-value
	Low birth weight (< 2500 gram)	Normal birth weight (2500-4000 gram)			
Antenatal care					
Good	25 (36.2%)	456 (68.8%)	481 (65.7%)	29.38	<0.001*
Poor	44 (63.8%)	207 (31.2%)	251 (34.3%)		
Total	69 (100.0%)	663 (100.0%)	732(100.0%)		
Mother smoking habit					
Smoker	2 (2.9%)	1 (0.2%)	3(0.4%)	0.002* f	
Passive smoking	8 (11.6%)	34 (5.1%)	42 (5.7%)		
Non smoker	59 (85.5%)	628 (94.7%)	687 (93.9%)		
Total	69 (100.0%)	663 (100.0%)	732(100.0%)		
Father smoking habit					
Smoker	19 (27.5%)	182 (27.5%)	201 (27.5%)	0.00	0.988
Non smoker	50 (72.5%)	481 (72.5%)	531 (72.5%)		
Total	69 (100.0)	663 (100.0)	732 (100.0)		

*P value ≤ 0.05 was significant. f: Fisher-exact test.

Table (3) shows the association between severity of low birth weight including (1000-2000 gram and 2100-2400 gram) and study variables including (antenatal care, and mother and father smoking history). There was no significant association between severity of low birth weight and these variables.



Table 3: The association between severity of low birth weight and study variables

Study variables	Type of low Birth weight		Total	X ²	P-value
	(1000-2000 gram)	(2100-2400 gram)			
Antenatal care					
Good	8 (36.4)	17 (36.2)	25 (36.2)	0.00	0.988
Poor	14 (63.6)	30 (63.8)	44 (63.8)		
Total	22 (100.0)	47 (100.0)	69 (100.0)		
Mother smoking habit					
Smoker	2 (9.1)	0 (0.0)	2 (2.9)	0.158 f	
Passive smoking	3 (13.6)	5 (10.6)	8 (11.6)		
Non smoker	17 (77.3)	42 (89.4)	59 (85.5)		
Total	22 (100.0)	47 (100.0)	69 (100.0)		
Father smoking habit					
Smoker	6 (27.3)	13 (27.7)	19 (27.5)	0.001	0.973
Non smoker	16 (72.7)	34 (72.3)	50 (72.5)		
Total	22 (100.0)	47 (100.0)	69 (100.0)		

*P value ≤ 0.05 was significant. f: Fisher-exact test.

DISCUSSION

In this study the percentage of low birth weight in term neonates was 9.2%,

While in other studies as in Zaid R. Al-Ani et al -at Al- Ramadi Maternity and Pediatrics Hospital ;the percentage of low birth weight in term neonates was 10.25%⁽¹⁸⁾,while and in Sajjad ur Rahman et al in Qatar ; they found in term neonates the percent of LBW. was 7.85%⁽¹⁹⁾.

Poor antenatal care was found to be associated with significant correlation with low birth weight among term newborns. This was consistent to other studies as in S J Allen et al. which demonstrated that antenatal clinic attendance was negatively associated with IUGR⁽²⁰⁾. Antenatal care considered very important in one of American study that assumed mothers who not take an antenatal care were Four times of more risk of delivering low birth weight neonate⁽²¹⁾.

The present study showed that smoking during pregnancy had high dangerous of LBW in full-term newborns. Compared with non- smoking mothers, maternal smoking (whether active or passive smoking) had higher incidence of low birth weight. The same correlation was found in other studies as in Mariana C. et al.⁽²²⁾ and Priscilla P. et al.⁽²³⁾. Nicotine causes uterine vasoconstriction by inducing maternal catecholamine release.

In other study the prevalence of low birth weight was 21%. Not received nutritional counseling during antenatal care (AOR = 2.03, 95% CI: 1.01, 4.06), preterm birth (AOR = 18.48, 95% CI: 6.51, 52.42), maternal smoking (AOR = 3.97, 95% CI: 1.59, 9.88), and height of the



mother less than 150 cm (AOR = 3.54, 95% CI: 1.07, 11.76) were significantly associated with Low birth weight.⁽¹²⁾

Paternal smoking had insignificant correlation with low birth weight in our study. This was consistent to Yuh-Jyh Lin.⁽²⁴⁾ While in Matsubara F et al.⁽²⁵⁾, Fathers and mothers' smoking are associated with LBW., and mothers smoking giving a more risk. Mother smoking could affect intrauterine growth and birth weight by multiple methods. Nicotine, the most important component of tobacco, is present in the placenta at 15% higher concentration than in maternal blood. Nicotine causes uterine vasoconstriction by inducing maternal catecholamine release⁽²⁶⁾. Furthermore, maternal smoking increases carboxyhemoglobin levels of umbilical arteries and this results in fetal hypoxia⁽²⁶⁾. Maternal smoking may also affect LBW by decreasing the concentration of leptin⁽²⁷⁾.

In the present study, a comparison between severity of low birth weight and study variables was done. No significant difference was found. This may be due to the fact that the two groups (1500-2000gm and 2100-2400gm) are both considered within same category (low birth weight) according to Organization WH.⁽²⁸⁾

Conflict of interests.

There are non-conflicts of interest.

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