

Impact of Maternal Overweight and Obesity on Perinatal Outcomes

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Abstract

Maternal obesity adversely affects perinatal outcome through increasing rates of hypertensive disease during pregnancy, diabetes, cesarean section and fetal macrosomia.

Objective: To investigate the prevalence of prepregnancy over weight and obesity and their impact on pregnancy and perinatal outcomes in Jordan.

Design: A prospective study comparing prepregnancy BMI categories with pregnancy and perinatal outcomes.

Setting: University teaching hospital.

Population: singleton term babies (>37 weeks) born in the year 2009.

Method: A total of 2129 newborns were categorized according to their mothers self reported body mass index (BMI) into three groups (normal, over weight and obese). Multivariate regression analysis was performed. The main outcomes were pregnancy induced hypertension, gestational diabetes, mode of delivery, birthweight, neonatal admission and death.

Results: A total 2129 newborns were identified. The incidence of overweight and obese mothers was 33.6% and 12.5%, respectively. In comparison to mothers with normal BMI, overweight and obese mothers were older and more likely to be multiparous. Their pregnancy was at a significantly higher risk for pregnancy-induced hypertension, gestational diabetes, Cesarean delivery, induction of labor, giving birth to a macrocosmic baby and neonatal admission. Obese women were less likely to have instrumental delivery. Babies born to overweight and obese mothers were not at a higher risk of having other short adverse perinatal outcomes.

Conclusion: Increasing prepregnancy BMI was associated with increased risk of adverse outcomes. Effective Interventional programs are important implications for health policy for counseling mothers during antenatal, postnatal and primary health care visit.

Keywords: Maternal Obesity, Outcome, Perinatal, Prepregnancy Body Mass Index, Risk Factors, Jordan.

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Introduction

The rising prevalence of obesity in developed countries is an important clinical risk factor encountered in perinatal practice⁽¹⁾. There is a similar increasing burden of obesity in developing countries as a consequence of over nutrition, sedentary lifestyle and maternal-fetal factors⁽²⁾. Previous studies in Jordan showed that more than half of the Jordanian adult females were overweight or obese⁽³⁻⁴⁾. Maternal obesity has long been correlated with increased maternal and perinatal risks⁽⁵⁾. The maternal risks include pregnancy induced hypertension, gestational diabetes, fetal macrosomia; cesarean deliveries, postpartum endometritis and prolonged hospital stay⁽⁶⁾. The identified short term perinatal risks include induction of labor, preterm delivery, instrumental vaginal delivery, stillbirth and cesarean delivery. Several studies have also described an association between maternal weight and neonatal mortality and morbidity such as a higher rate of neonatal macrosomia⁽⁷⁾, neural tube defects, birth asphyxia, large for gestation age, birth trauma, neonatal hypoglycemia and jaundice which in turn leads to an increased cumulative health service cost. Since maternal obesity has a significant impact on maternal metabolism and offspring development, the American College of Obstetricians and Gynecologists⁽⁸⁾ recommended collection of maternal height and weight data during the first prenatal visit for body mass index (BMI) calculations. Moreover, the CDC workgroup recommended the integration of aspects of preconception health into existing local primary public health care⁽⁹⁾. To minimize the risk of adverse pregnancy outcomes in the future, effective intervention strategy by women with obesity should be encouraged in

order to undertake a weight reduction program.

There is a paucity of information about the prevalence and the impact of overweight and obesity on maternal and neonatal outcomes in Jordan. The aim of our study was to determine the prevalence of overweight and obesity in a cohort of Jordanian pregnant mothers and to determine their associations with major maternal and perinatal complications in healthy Jordanian women delivering singleton term babies.

Methods

Data collection

The studied group included all Jordanian mothers and their alive single term (>37 weeks) newborns who were born at Jordan University Hospital (JUH), Amman- Jordan between the 1st of January and 31st of December 2009. All preterm infants and those with incomplete data and infants of lean mothers (BMI < 18.5 kg/m²) were excluded. Ethical approval was obtained from the ethical committee at JUH and the deanship of scientific research. All participant mothers received full information about the purpose of the study prior to their consent. Maternal and perinatal data were prospectively collected by a trained research assistant through abstract information from medical records and in-person visits to mothers at the hospital following delivery. The data were reviewed by the attending physician. Mothers were divided into five BMI groups according to the World Health Organization's definition: normal weight as (BMI 18.5 - 24.9 kg/m²), overweight (BMI b 25.0 - 29.9 kg/m²), obese class I (BMI >30 – 34.9 kg/m²), obese class II (BMI 35- 39.9 kg/m²) and obese class III (BMI > 40 kg/m²) For final analysis we considered BMI > 30 as an obese group.

Maternal data and outcome

The collected maternal data were maternal age at delivery, parity, self-reported prepregnancy weight and height, maternal illnesses before and during pregnancy, smoking and information about placental and cord problems. Prepregnancy weight was used to calculate body mass index (BMI) using the formula; weight in Kg/ height in (m²). The main studied outcomes were the mode of delivery (spontaneous or induced vaginal delivery, elective or emergency caesarean delivery), instrumental delivery, preexisting hypertension and diabetes mellitus (DM), pregnancy induced hypertension (PIH), gestational diabetes mellitus (GDM), placenta previa, abruption placenta, ante partum ultrasound estimate of oligohydramnious, macrosomia defined as fetal weight in excess of 4000 g, meconium stained amniotic fluid, prolonged rupture of membrane (PROM) more than 18 hours, cephalic pelvic disproportion (CPD), gestation age at birth, condition at birth (Apgar scores, use of positive pressure ventilation (PPV) and flaccid or vigorous), birthweight, sex of newborn, admission to neonatal intensive care unit (NICU) > 24 hours, respiratory insufficiency (defined as need O₂ and signs of respiratory distress), Jaundice, proved sepsis, hypoglycemia, birth injuries, congenital birth defects and neonatal death.

Definitions

Gestational diabetes was defined as: fasting blood glucose ≥ 5.1 mmol/l and/ or after 75 gram oral glucose tolerance test, a 1-h blood glucose (≥ 10.0 mmol/L and or 2-h blood glucose $\geq (8.5$ mmol/L)⁽¹⁰⁾. Pregnant mothers did not perform universal screening for gestational diabetes at the time of this study.

Women were screened on the basis of presence of risk factors according to the American Diabetes Association (ADA) and the American College of Obstetrics and Gynecology (ACOG) which included overweight and obesity, personal history of GDM or delivery of a baby greater than 4Kg, glycosuria, or strong family history of diabetes in first degree relatives, history of abnormal glucose tolerance, previous perinatal loss, birth of a malformed child, poly hydramnious, glycosuria at the first prenatal visit, polycystic ovary syndrome, current use of glucocorticoids and presence of preexisting essential hypertension.

Pregnancy induced hypertension (PIH) was defined as a blood pressure of 140/90 mmHg or a rise in systolic blood pressure by 30 mmHg or diastolic blood pressure by 15 mmHg from the baseline after 20 weeks' gestation, in addition to either +1 dipstick proteinuria on two separate occasions, 2 dipstick proteinuria on one occasion or 300 mg proteinuria over 24 hours⁽¹¹⁾. **Elective cesarean** section was defined as a planned cesarean section delivery regardless of labor. **Emergency cesarean** section was defined as cesarean section due to urgent obstetric, medical or fetal causes. **Small for gestational age** was defined as birthweight less than or equal to the 10th percentile and **large for gestational age** as birthweight greater than or equal to the 90th percentile. **Macrosomia** was defined as birthweight greater than 4.0 kg.

Statistical Methods

Statistical analysis was carried out using Statistical Package for Social Scientists (SPSS version 17). Maternal and neonatal characteristics and outcomes were examined and data presented as raw frequencies and adjusted odds ratios with 95% confidence

intervals. Multiple logistic regression analysis was used to evaluate the association between prepregnancy BMI and perinatal complications. Data were adjusted for confounders to affect pregnancy outcome

(maternal age, parity, preexisting diabetes, preexisting hypertension, smoking, and gender of the baby). P-value of less than 0.05 was regarded as statistically significant.

Table 1. Maternal and neonatal characteristics of the study group, according to pre-pregnancy body mass index (BMI)

Variable	Mothers' pre-pregnancy BMI category			P-value
	Normal n= 1049 n (%)	Overweight n= 715 n (%)	Obesity n= 265 n (%)	
Maternal age at delivery (year)				<0.005
<25	313 (27.2)	107 (15.0)	17 (6.4)	
25-29	391(34.0)	213 (29.8)	64 (24.2)	
30-34	286 (24.9)	178 (24.9)	85 (32.1)	
≥35	159 (13.8)	217 (30.3)	99 (37.4)	
Parity				<0.005
0	408 (35.5)	148 (20.7)	44 (16.6)	
1	322 (28.0)	165 (23.1)	50 (18.9)	
2	196 (17.1)	129 (18.0)	42 (15.8)	
3	114 (9.9)	124 (17.3)	34 (12.8)	
≥4	109 (9.5)	149 (20.8)	95 (35.8)	
Gestational age				<0.012
37	178 (15.5)	159 (22.2)	70 (26.4)	
38	262 (22.8)	166 (23.2)	62 (23.4)	
39	338 (29.4)	164 (22.9)	50 (18.9)	
40	306 (26.6)	183 (25.6)	61 (23.0)	
41	56 (4.9)	42 (5.9)	16 (6.0)	
42	9 (0.8)	1 (0.1)	6 (2.3)	
Preexisting hypertension	4 (.3)	10 (1.4)	6 (2.3)	0.004
Preexisting diabetes mellitus	5 (.4)	10 (1.4)	4 (1.5)	0.052
Smoking	30 (2.6)	18 (2.5)	9 (3.4)	0.834
Sex of the newborn				0.178
Female	550 (47.9)	373 (52.2)	135 (50.9)	
Male	599 (52.1)	342 (47.8)	130 (49.1)	

Results

Participants' characteristics

A total of 3865 deliveries had occurred in the study period and of those 1736 deliveries were excluded. This study included 2129 newborns. Of all women, 1149 (53.9%) had normal weight, 715 (33.6%) had overweight,

265 (12.5%) had obesity (217 (10.2%) class I obesity, 38 (1.8%) class II obesity and 10 (0.5%) class III obesity). About half (51.9%) of the mothers were younger than 30 years at time of delivery with a mean age of 29.7 years (SD+ 5.7). The mean ages of the normal, overweigh and obese mothers were 28.2, 30.9

and 32.5 years, respectively. About 28.2% of the mothers were primiparous. (35.5% had normal BMI, 20.7% overweight and 16.7% obese). Table 1 shows the maternal and neonatal characteristics of the study group

according to BMI category. Women with overweight and obesity were older, more likely to be multiparous, and more likely to report having preexisting hypertension when compared to mothers with normal BMI.

Table 2. The incidence rates of complications of pregnancy, labor and delivery in relation to pre-pregnancy body mass index (BMI)

	Mothers' pre-pregnancy BMI category				P-value
	Normal n (%)	Overweig ht n (%)	Obesity n (%)	Total n (%)	
Pregnancy-induced hypertension	9 (0.8)	18 (2.5)	23 (8.7)	50 (2.3)	<0.01
Gestational diabetes	2 (0.2)	6 (0.8)	5 (1.9)	5 (1.9)	0.003
Cesarean delivery	415 (36.1)	350 (49.0)	156 (58.9)	921 (43.3)	<0.005
Mode of delivery					<0.005
Spontaneous	661 (57.5)	320 (44.8)	90 (34.0)	1071 (50.3)	
Induction	73 (6.4)	45 (6.3)	19 (7.2)	137 (6.4)	
Elective	161 (14.0)	166 (23.2)	93 (35.1)	420 (19.7)	
Urgent	254 (22.1)	184 (25.7)	63 (23.8)	501 (23.5)	
Instrumental delivery	56 (4.9)	16 (2.2)	2 (0.8)	74 (3.5)	<0.005
Placenta previa	9 (0.8)	1 (0.1)	3 (1.1)	13 (0.6)	0.113
Abruptio placenta	2 (0.2)	1 (0.1)	0 (0.0)	3 (0.1)	0.793
Oligohydramnious	9 (0.8)	7 (1.0)	1 (0.4)	17 (0.8)	0.641
Cephalo pelvic disproportion	11 (1.0)	4 (0.6)	1 (0.4)	16 (0.8)	0.471
Prolonged rupture of membranes	12 (1.0)	8 (1.1)	0 (0)	20 (0.9)	0.235
Meconium stained amniotic fluid	97 (8.4)	51 (7.1)	22 (8.3)	170 (8.0)	0.586

Complications of pregnancy, labor and delivery according to BMI

Table 2 shows the incidence rates of complications of pregnancy, labor and delivery in relation to BMI categories. Of all women, 2.3% developed PIH and 1.9% developed gestational diabetes. The incidence rates of PIH and gestational diabetes were the highest among women with obesity. About 43.3% of women delivered via C/S. Women with obesity had significant higher incidence to deliver via elective C/S. The incidence of instrumental delivery was significantly lower in obese group. There were no significant differences between mothers with normal

BMI, overweight, and obesity in the incidence rates of other maternal complications including placenta previa, abruption placenta, Oligohydramnious, CPD, PROM, and meconium stained amniotic fluid.

Adverse neonatal outcomes according to BMI.

Of the total newborns, 15.3% were admitted to the NICU, 7.5% had respiratory insufficiency, 3.3% had jaundice, 1.4% had malformations, 0.3% had birth injury, and 0.8% had proved sepsis, 0.5% hypoglycemia and four deaths (0.3%). About 3.1% had birthweight <2500 gm, 4.1% had birthweight

>4000 gm, 14.7% were SGA, and 5.1% were LGA. Table 3 shows the incidence rates of adverse neonatal outcomes in relation to BMI categories. Women with obesity were more likely to deliver at gestational age of 41 or more. Babies born to overweight mothers are more likely to have neonatal admission. There has been a dose response relationship between the incidence of macrosomia (BW of >4000

grams) and LGA with increasing BMI ($p < 0.005$). The incidence of other neonatal complications including, flaccidity at birth, use of PPV, low Apgar score at 5 min. meconium aspiration syndrome (MAS) Respiratory insufficiency, birth injuries, malformation, jaundice, sepsis and death were not associated with overweight and obesity.

Table 3. The incidence rates of adverse neonatal outcomes in relation to pre-pregnancy body mass index (BMI)

	Mothers' pre-pregnancy BMI category				P-value
	Normal n (%)	Overweight n (%)	Obesity n (%)	Total n (%)	
GA \geq 41 weeks	9 (0.8)	1 (0.1)	6 (2.3)	16 (0.8)	0.003
abnormal Baby presentation	73 (6.4)	51 (7.1)	18 (6.8)	142 (6.7)	0.428
Baby condition at birth					
Flaccidity at birth	59 (5.1)	35 (4.9)	12 (4.5)	106 (5.0)	0.912
PPV	66 (5.7)	43 (6.0)	15 (5.7)	124 (5.8)	0.964
Apgar < 7 at 5 min					
Baby admitted to NICU	155 (13.5)	129 (18.0)	42 (15.8)	326 (15.3)	0.029
Causes of admission					
Respiratory insufficiency	76 (6.6)	64 (9.0)	20 (7.5)	160 (7.5)	0.177
Jaundice	34 (3.0)	29 (4.1)	7 (2.6)	70 (3.3)	0.356
Malformation	13 (1.1)	13 (1.8)	3 (1.1)	29 (1.4)	0.435
Birth injury	3 (0.3)	3 (0.4)	1 (0.4)	7 (0.3)	0.38
Proved Sepsis	6 (0.5)	8 (1.1)	2 (0.8)	16 (0.8)	0.349
Hypoglycemia	6 (0.5)	1 (0.1)	3 (1.1)	10 (0.5)	0.121
Death	4 (0.3)	4 (0.6)	0 (0.0)	8 (0.4)	0.434
Birthweight (gm)					<0.005
<2500	37 (3.2)	24 (3.4)	4 (1.5)	65 (3.1)	
> 4000	28 (2.4)	38 (5.3)	21 (7.9)	87 (4.1)	
Birthweight percentile					
SGA	199 (17.3)	87 (12.2)	26 (9.8)	312 (14.7)	<0.005
LGA	32 (2.8)	48 (6.7)	28 (10.6)	108 (5.1)	

Multivariate analysis

The multivariate analysis (Table 4) shows the associations between BMI and each complication during pregnancy and perinatal period after adjusting for maternal age, parity,

preexisting diabetes, preexisting hypertension, smoking, and gender of the baby. Compared to women with normal BMI, women with overweight were significantly more likely to develop PIH (OR=2.54), have induction of

labor (OR=2.1) and to deliver via C/S (OR=1.61). The odds of PIH (OR=9.07) and gestational diabetes (OR=9.81) were much higher among obese women compared to women with normal BMI. Obesity was significantly associated with increased odds of caesarean delivery (OR=2.28) and decreased

odds of instrumental delivery (OR=0.21). Elective and urgent caesareans were significantly more common among women with overweight and obesity. The risks of high birthweight delivery and large for GA delivery were significantly higher among women with overweight and obesity.

Table 4. The multivariate analysis of the association between BMI and complications of pregnancy, labor and delivery and adverse neonatal outcomes*

	Body Mass Index						
	Normal OR	Overweight OR	95% CI	P-value	Obesity OR	95% CI	P-value
Gestational hypertension	1	2.54	(0.12, 5.80)	0.026	9.07	(4.02, 20.45)	0.000
Gestational diabetes	1	3.94	(0.77, 20.06)	0.099	9.81	(1.88, 52.68)	0.008
Caesarean delivery	1	1.61	(1.32, 1.97)	0.000	2.28	(1.71, 3.04)	0.000
Elective C/S	1	3.39	(2.38, 4.84)	0.000	1.81	(1.39, 2.36)	0.000
Urgent caesarean	1	1.84	(1.27, 2.66)	0.001	1.55	(1.22, 1.98)	0.000
Induction delivery	1	2.11	(1.19, 3.75)	0.011	1.37	(0.91, 2.06)	0.132
Instrumental delivery	1	0.61	(0.34, 1.10)	0.101	0.21	(0.05, 0.91)	0.037
Malpresentation	1	1.07	(0.73, 1.57)	0.718	0.93	(0.53, 1.68)	0.807
Placenta previa	1	0.14	(0.02, 1.20)	0.073	**		
Abruption placenta	1	1.01	(0.09, 11.25)	0.999	**		
Oligohydranise	1	1.70	(0.61, 4.72)	0.309	0.62	(0.07, 5.12)	0.654
CPD	1	0.49	(0.15, 1.63)	0.248	0.32	(0.04, 2.65)	0.292
Meconium stained amniotic fluid	1	0.89	(0.62, 1.29)	0.557	1.07	(0.64, 1.78)	0.797
PPV	1	1.02	(0.67, 1.54)	0.929	0.95	(0.52, 1.75)	0.877
Baby admitted to NICU	1	1.33	(1.02, 1.75)	0.037	1.09	(0.73, 1.63)	0.663
Respiratory insufficiency	1	1.30	(0.90, 1.86)	0.157	1.01	(0.59, 1.73)	0.967
Jaundice	1	1.22	(0.72, 2.06)	0.466	0.74	(0.31, 1.74)	0.492
Malformation	1	1.23	(0.54, 2.78)	0.626	0.67	(0.18, 2.50)	0.549
Birth injury	1	1.71	(0.30, 9.70)	0.546	1.30	(0.10, 16.32)	0.836
Sepsis	1	2.22	(0.72, 6.84)	0.165	1.36	(0.25, 7.359)	0.724
Neonatal hypoglycemia	1	0.10	(0.01, 1.32)	0.081	0.91	(0.12, 7.541)	0.928
PROM	1	1.36	(0.53, 3.49)	0.522	**		
Death	1	1.32	(0.31, 5.56)	0.707	**		
Flaccid	1	1.03	(0.66, 1.62)	0.885	0.95	(0.49, 1.86)	0.888
Gestational age at delivery >=41	1	0.17	(0.02, 1.38)	0.098	2.34	(0.72, 7.61)	0.157
Birthweight <2500	1	0.59	(0.20, 1.73)	0.340	1.27	(0.74, 2.19)	0.386
Birthweight >4000	1	2.62	(1.42, 4.83)	0.002	1.91	(1.14, 3.18)	0.013
Small for GA	1	0.64	(0.40, 1.00)	0.051	0.77	(0.58, 1.02)	0.066
Large for GA	1	2.69	(1.55, 4.69)	0.000	1.89	(1.18, 3.03)	0.008

* Adjusted for maternal age, parity, preexisting diabetes, preexisting hypertension, smoking, and gender of the baby

** Odds ratio were not calculated because of small numbers of the corresponding events

Discussion

This study provides information on 1.4% of all deliveries in Jordan (158000 in the same time period)⁽¹²⁾ and confirms the high prevalence of overweight and obesity among Jordanian ladies entering pregnancy. This high rate (44%), was comparable to that reported in Western countries (40.5% in USA⁽¹³⁾, 46% in UK⁽¹⁴⁾ and lower than that reported regionally (67% in Saudi Arabia⁽¹⁵⁾ and 40% of obesity alone in United Arab Emirates⁽¹⁶⁾). Increased BMI proved to have significant positive correlation with increased mean maternal age and with each consecutive pregnancy, which is consistent with other studies^(1,17). The incidence of smoking among pregnant ladies was less than that reported by other studies⁽¹⁸⁾ and reflects the low incidence of smoking among adult women in Jordan as demonstrated by Ajluni et.al(19) (6.2% in adult females more than 25 years of age).

Maternal outcomes

In agreement with previous conducted studies, this study showed that increased prepregnancy BMI was associated with two metabolic disorders: pregnancy induced hypertension^(7, 20), and gestational diabetes^(17, 21). In this study these risks were nine times higher in obese when compared to normal weight mothers and persisted after adjustment of other confounders. The frequencies of PIH in normal weight, overweight, and in obese mothers were 0.8%, 2.5% and 8.7% respectively, while that of gestational diabetes were; 0.2%, 0.8 and 1.9% respectively. Compared to normal weight mothers, the study results were within the lower range of the reported incidence of PIH (1–14%) and GDM (0.3% – 22.9%) (18, 22-24). The low incidence of GDM in our cohort may be explained by the lack of a universal screening

for gestational diabetes and differences in the distribution of genetic and environmental risk factors. Previous studies showed a strong association between increased BMI and induction of labor (7, 25-26). This has been explained partly by the higher incidence of diabetes and pregnancy induced hypertension⁽¹⁾. However, the study results showed that this adjusted risk is significant only for overweight mothers. Possible explanation is that obese were more likely to have elective CS compared to normal weight mothers (35.1% vs. 14.0% $p < 0.05$). The study results proved that increased BMI is a risk factor for neonatal admission and for both elective and urgent cesarean deliveries which are similar to other studies^(7, 17, 27); possibly due to different labor characteristics⁽²⁸⁾ as well as having higher birthweight babies. These risks persisted after adjustment for parity, maternal age, smoking, preexisting diabetes, preexisting hypertension and gender. Similar to TY Leung et al report⁽¹⁷⁾, the chance of instrumental delivery decreased with increased BMI. Possible explanation is the higher rate of cesarean deliveries with increasing BMI. In contrast to the majority of studies in the literature⁽²⁹⁻³⁰⁾, the adjusted study data was not adequately powered to detect significant differences in other outcomes as oligohydramnious, PROM, congenital malformation, birth injuries, meconium stained amniotic fluid, proved sepsis, baby depression at birth, respiratory insufficiency and neonatal death.

Effect of maternal obesity on perinatal outcome

Bhattacharya et al results⁽⁷⁾ showed that low birth weight was significantly less common in obese ($P < 0.005$) than normal and overweight mothers. In this study post term (delivery after

41 completed weeks) and low birth weight was significantly higher in the obese as compared in the normal BMI group and in overweight group. However this difference did not remain statistically significant after adjusting for confounders. On the other hand, when overweight is concerned, this study found a strong positive linear association between maternal BMI and macrosomia. The incidence of macrosomia increased linearly with increasing BMI, 2.8% in normal, 5.3% in overweight and 7.9% in obese mothers resulting in an adjusted Odds Ratio of 2.6 (95% CI 1.4,4.8) for overweight and 1.91 (95%CI 1.14, 3.18) in obese mothers these results are comparable with studies^(7,17).

Limitation

This hospital based data where the BMI calculations were based on self reporting prepregnancy height and weight. Literature review showed that most studies have relied on the woman's recall of her pre-pregnancy height and weight. The sample size is relatively small, particularly the proportion of women in the obese categories.

Conclusion

This study gave evidence based information on the impact of obesity on maternal and short perinatal outcome in Jordan. Maternal Child Health (MCH) services are widely spread throughout Jordan and 98 percent of Jordanian pregnant women receive prenatal care. Health education programs which are relevant to the Jordanian pregnant women's health are highly needed during prenatal and postnatal care. This is a good

opportunity in an ideal time to decrease the adverse consequence of increasing prepregnancy BMI. Implementing aggressive interventional agenda are needed through universal antenatal screening (for early identification of GDM and recognition of overweight and obese women) and education health care providers to counseling women about the importance of adoption weight control and healthy lifestyle are important implications for health policy.

Authors' contributions

Eman Badran conceived and designed the study, supervised and reviewed the data, and drafted the article. Amal M. Abu Libdeh: Reviewed neonatal data and revised the manuscript. Fawaz Kasaleh, Shawki Saleh, Asma Basha and Fida Thekrallah revised maternal data. Yousef Khader Reanalyzed and interpreted the data, write the results and revised the manuscript. Nada Yaseen conceived and drafted the manuscript. All authors have critically reviewed the manuscript and approved the final manuscript.

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Disclosure

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أثر زيادة الوزن والسمنة لدى الأمهات الحوامل في الفترة المحيطة بالولادة

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الملخص

تؤثر زيادة الوزن والسمنة لدى الأم الحامل سلباً في فترة ما حول الولادة من خلال زيادة معدلات الإصابة بأمراض ارتفاع ضغط الدم ومرض السكري أثناء الحمل، وإجراء العمليات القيصرية وزيادة وزن الجنين عن المعدل الطبيعي.

الهدف: التحقيق من انتشار زيادة الوزن والسمنة في المرحلة المبكرة قبل الحمل وتأثير ذلك على الفترة المحيطة بالولادة في الأردن.

الطريقة: هي دراسة مستقبلية تقارن تأثير زيادة مؤشر كتلة الجسم مباشرة قبل الحمل مباشرة بالأمهات اللاتي لديهن مؤشر كتلة الجسم عادية على الفترة المحيطة بالولادة عند المواليد مكتملي النمو (أكثر أو يساوي 37 أسبوعاً) الذين ولدوا في عام 2009 في مستشفى جامعي تعليمي.

وصنفت هذه الدراسة المواليد الجدد وفقاً إلى مؤشر كتلة الجسم (BMI) عند الأم قبل الحمل مباشرة إلى ثلاث مجموعات (عادي، وزيادة الوزن، والبدانة). تم إجراء تحليل الانحدار متعدد المتغيرات وتمت دراسة المتغيرات التالية: ارتفاع ضغط الدم والسكري أثناء الحمل، وطريقة الولادة، والوزن عند الولادة، وإدخال حديثي الولادة إلى العناية المركزة لحديثي الولادة والوفاة.

النتائج: تمت دراسة 2129 حديثي الولادة. كانت نسبة زيادة الوزن والسمنة لدى أمهاتهم 33.6% و12.5% على التوالي. عند مقارنة الأمهات اللاتي لديهن زيادة الوزن والسمنة مع الأمهات اللاتي لديهن مؤشر كتلة الجسم عادية. تبين ما يلي عند الأمهات البدنيات: وجود تقدم السن، ووجود حمل متكرر. وكان حملهن أكثر عرضة لارتفاع ضغط الدم الناجم عن الحمل وحدوث سكري الحمل، والولادة القيصرية، وضرورة تحريض المخاض، واستعمال أكثر للأدوات المساعدة للولادة كالملقط والشفاط وعانى المواليد من زيادة أكثر بالوزن عند الولادة، وكانوا عرضة أكثر للدخول إلى العناية المركزة.

الاستنتاجات: كانت زيادة مؤشر كتلة الجسم ما قبل الحمل مرتبطة مباشرة مع زيادة حدوث مرض ضار للأمهات أثناء الحمل والولادة ووجود تأثير سلبي على مواليدهن. ومن أهم انعكاسات هذه الدراسة أحداث برامج تدخليه فعالة على السياسة الصحية في الأردن التي تؤكد على الحاجة لتقديم المشورة للأمهات أثناء زيارتهن للرعاية الصحية قبل الولادة وما بعد الولادة.

الكلمات الدالة: زيادة الوزن لدى الأمهات الحوامل، مؤشر كتلة الجسم، عوامل الخطر.