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IMPACT OF MATERNAL OBESITY AND OTHER RISK FACTORS ON THE MODE OF DELIVERY

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ABSTRACT

Background: Obesity is one of the most important threats to health in general and the health of pregnant women and pregnancy in particular. **Aim**: To determine the association between BMI and mode of delivery among pregnant during the study period. **Method**: A case-control study was conducted among pregnant women attending the labor room with induced or spontaneous labor at obstetrics department of Fatima Al-Zahra with the age range 15 to 45 years in Baghdad, Iraq. The case and controls were selected randomly from the list of patient admission. Sample size of this study was 362 (181 cases, 181 controls). Structured questionnaires were used for data collection. Data was checked for quality and statistical assumptions. STATA version 14 statistical packages were used to analyze the data and type 1 error was set at 5%. **Results**: - Our finding found that (38.4%) still in the age more than 35 years old. (77.3%) of pregnant were housewives, 265/362 (73.2%) of pregnant without university degree, 149 /362 (41.2%) were living under low SES. Overweight mothers had increased odds of caesarian birth (adjusted odds ratio [AOR] = 1.72; 95% Confidence Interval [CI] 0.8- 1.91), and also among women with obesity had increased the odds of caesarian (AOR=2.7 with 95%CI (1.23 to 4.11). **Conclusion**: There are associations between overweight and obese women with the mode of delivery at the p. value less than 0.05. Healthy lifestyle behaviors appear to protect females in professional and associate professional occupations from overweight and obese.

KEYWORD: Maternal, Age, Obese, Risk, Delivery.

INTRODUCTION

Over the past decades, there has been a significant increase in the average age among primipara women, and a rise in the body mass index (BMI) among pregnancies in high-income countries.[1,2] Obesity is one of the most important threats to health in general and the health of pregnant women and pregnancy in particular, as it leads to the occurrence of some pregnancy problems that can affect the health of the pregnant woman such as: high blood pressure and gestational diabetes.[3] Obesity is defined as the increase in body weight as a result of the accumulation of fat in different areas of the human body.[4] Obesity is the fifth major cause of global health risks.[5] The main cause of obesity is due to an imbalance between the balance of calories gained and the calories consumed, in addition to following nutritional habits and poor lifestyles.[6] The relationship between obesity and pregnancy is an inverse relationship.[7] lower chance of pregnancy if the body index was higher From 29, as fertility decreases by 4%, then weight gain adds years to your life, so it may be your age A larger body of your life time, and you can calculate BMI through your body mass calculator to our site.[8,9] Increasing your weight may lead to birth difficulties and problems, high blood pressure, blood clots, preeclampsia, and affect your fetus' health as it increases your risk of obesity, diabetes, heart disease, and some types of cancer.[10,11] This study aimed to determine the association between BMI and mode of delivery.

METHODS

Cases and controls selection

A case-control study was conducted among pregnant women attending the labor room with induced or spontaneous labor at obstetrics department of Fatima Al-Zahra with the age range 15 to 45 years in Baghdad, Iraq. The case and controls were selected randomly from the list of patient admission that occurred from 1st of January 2019 up to 31 of December 2019 were enrolled in this study. Each case was matched with one controls in the similar age ranges with the selected case at the same period of admission in the same hospital where admitted. The inclusion criteria were women with normal pregnancy (no pathological conditions) at ≥ 37 weeks of gestation. Primigravida and multigravida with normal pregnancy and live cephalic singleton fetuses were included. Pregnant women with elective cesarean section, hypertension, and diabetes were excluded. Also, multiple gestations, and abnormal lie fetus at time of labor were also excluded.

Sample size and data collection tools

The sample size of this study was 362 (181 cases, 181 controls). Structured questionnaires were used for data collection. The content of the questionnaires has provided by literature review and an expert opinion .Education was measured by the highest degree earned and was coded to two categories (university degree versus less than university degree). Similarly, occupation status was coded to having versus don't have job and student. Socioeconomic status (SES) was measured by ten questions that ask the assets the participant have and coded to good, intermediate and poor level. BMI was measured the highest and weight and coded to 4 categories underweight (less than 18), normal (18.5-22.9), over weight (23 -24.9) and obese (more than 25). Mode of delivery was coded to normal and cesarean section.

Data analysis

Before main analysis, data was checked for quality and statistical assumptions. Data was described by descriptive statistics. Quintiles and PCA (Principle Components Analysis) was used to calculate the socioeconomic status. The multivariate analyses were conducted fitting a series of logistic models with generalized estimating equations (GEE) for estimating the effects of maternal BMI on the risk of caesarean birth while controlling for other confounding factors. The results of the multivariate analysis were obtained using adjusted odds ratios (AORs) with their p-values and 95% confidence intervals (CIs).STATA version 14 statistical package was used to analyze the data and type 1 error was set at 5%.

Ethical consideration

Ethical approval was obtained from the Ethics Committee at Ministry of Health, Baghdad, Iraq. Informed consent was obtained from each participant.

RESULTS

Table 1: shows maternal characteristics in the study group. Out of three hundred and sixty two, 181/362 (50%) of pregnant among case group and 181/362(50%) among control group. 139/362 (38.4%) of pregnant still in the age more than 35 years old. 280/362 (77.3%) of pregnant were housewives, 265/362 (73.2%) of pregnant without university degree, 149 /362 (41.2%) had poor SES, 145/362 (40.1%) had over weight and 183/362 (50.6%) had a CS delivery. There are significant associations between mode of delivery, BMI among case and control group at the P. value lees than 0.5. There are associations between overweight and obese women with the mode of delivery at the p. value less than 0.05 [Table 2].

Table 3 presents the multivariate logistic regression results. After controlling for potential confounders (BMI maternal age, educational level, SES) compared to normal BMI, overweight mothers had increased odds of caesarian birth (adjusted odds ratio [AOR] = 1.72; 95% Confidence Interval [CI] 0.8- 1.91), and also among women with obesity had increased the odds of caesarian (AOR=2.7 with 95% CI (1.23 to 4.11). The high risk groups with the age 15 up to 35 years compared to age above 35 years, the AOR =1.37 with 95% CI(0.61 to 3.08), AOR=1.15; 95% CI 0.74 to 2.17), respectively. The odds of caesarian among pregnant had no degree was 0.48 compared to who had a university degree. The odds of obese women was higher among those that had poor and intermediate SES level with AOR =0.71; CI0.42 to 1.19) and 0.66; CI 0.40 to 1.06), respectively.

Table 1: Distribution of studied sample of obesity among cases and controls (n= 362).

Variables	Cases (181)		Control (181)		Total (362)		P. value
	Frequency	Percent	Frequency	Percent	Frequency	Percent	
Age groups							
15-25 yrs	**54**	29.8	**57**	31.5	111	30.7	0.791
26-35 yrs	**59**	32.6	**53**	9.3	112	30.9	
More than 35	**68**	37.6	**71**	39.2	139	38.4	
Occupation							
Housewives	**141**	77.9	**139**	76.8	280	77.3	0.537
Employed	**23**	12.7	**29**	16.0	52	14.4	
Student	**17**	9.4	**13**	7.2	30	8.3	
Education							
With university degree	**46**	25.4	**51**	28.2	97	26.8	0.552
Without university degree	**135**	74.6	**130**	71.8	265	73.2	
SES							
Good	**61**	33.7	**59**	32.6	120	33.1	0.834
Intermediate	**44**	24.3	**49**	27.1	93	25.7	
Poor	**76**	42.0	**73**	40.3	149	41.2	
BMI							
Underweight /Less than 18.5	**12**	6.6	**15**	8.3	27	7.5	

Normal /18.5- 22.9	**34**	18.8	**41**	22.7	75	20.7	0.000
Overweight /23-24.9	**80**	44.2	**65**	35.9	145	40.1	
Obese / More than 25	**55**	30.4	**60**	33.1	115	31.7	
Mode of delivery							
Normal	**87**	48.1	**92**	50.8	179	49.4	0.001
CS	**94**	51.9	**89**	49.1	183	50.6	

Table 2: Distribution of studied samples according to BMI based on Mode of delivery.

BMI	**Mode of delivery**				**P. value**
	Cases (n= 181)		**Control (n=181)**		
	Normal	**CS**	**Normal**	**CS**	
	Frequency %	**Frequency %**	**Frequency %**	**Frequency %**	
Under weight	9 10.3	3 3.2	8 8.7	7 7.9	0.721
Normal	20 23.0	14 14.9	21 22.8	20 22.5	0.514
Overweight	33 38.0	47 50	36 39.1	29 32.5	0.002
Obese	25 28.7	30 31.9	27 29.4	33 37.1	0.000
Total	87 48.1	94 51.9	92 50.8	89 49.1	

Table 3: Multivariate logistic regression for maternal obesity and the risk of delivery.

Characteristics	**AOR**	**95% CI**
BMI		
Underweight	1.04	0.62-1.76
Normal	Ref.	
Overweight	1.72	0.81-1.91
Obese	**2.7**	**1.23- 4.11**
Age group		
15-25	1.37	0.71-3.08
26-35	1.15	0.84-2.17
More than 35	Ref.	
Education		
With university degree	Ref.	
Without university degree	0.48	0.29-0.81
SES		
Good	Ref.	
Poor	0.71	0.42-1.19
Intermediate	0.65	0.40-1.06

DISCUSSION

There has been a significant increase in the average age among pregnant women, and a rise in the body mass index (BMI) among pregnancies in high-income countries.[12] In our study found the highest percentage 38.4% of pregnant were in the age more than 35 years old and compared with other study in Malawi[9], the authors found the average age of pregnant was 29 years and they are obese. This difference related to lifestyle and culture between countries. Education has been shown to be associated with health outcomes in developed countries, and it is often used as an indicator of socioeconomic position.[13] However, there is interest in the causal relationship between education and health. In this study found 73.2% of pregnant were uneducated and they don't have university degree. Other results in Africa[11], the authors found the majority of cases were uneducated and its related to varies condition as a lifestyle living, social and physical problems and they living under poverty condition.

Several studies show that obesity among pregnant may have adverse problems which are related consequences such as home absence, feel of impairment, home limitation, and exposed to home injury.[9,12] Our finding 77.3% of pregnant were housewives and always they are sitting in the home, don't thinking about her weight, only they cook and eat. Other results found in Iraq[12], they found the majority of them are obese and without job. This refers to similarity of attitude and lifestyle. Reviews of the relationship between socioeconomic status and obesity include studies that use education as a proxy for socioeconomic status but conflate them with other measures of socioeconomic status when reporting

findings, with only one review separately considering the socioeconomic status and obesity relationship by how socioeconomic status was measured (including education). Different socioeconomic measures appear to have different relationships with weight change and obesity.[1,3,17] In this study found 41.2% of pregnant had lower socioeconomic status, other study in UK[17], and in Africa.[19] They also found most of them were living under low SES; this may be because of different culture between countries. In addition to being more at risk, women with obesity may suffer discrimination and humiliation at a time that should be joyful.[20] In our study found 40.1% of them had overweight and this disagrees with other study in India[21,22], the authors found, most of them were suffering from underweight during pregnancy and, they living under low SES levels. Also, in our study found 31.7% of them had obese and other study in Pakistan[23], they found a few of them were suffering from obese and the majority of them were suffering from many problems as medical, social and physical problems. Increasing maternal BMI exerts a progressive adverse effect on vaginal delivery rates for both primigravida and multigravida women.[24] In this study found 50.6% of pregnant were choosing the caesarean as easy way and avoid other complication. In Iran[3], the authors mentioned the most of pregnant preferred the caesarean section more than NVD to avoid the pain and other complication that may be occur during delivery.

CONCLUSION

The majority of them were in the age above 35 years old, housewives, uneducated, had overweight and obese, living under low SES level. There are a significant association between the BMI and mode of delivery at the p. value less than 0.05. Healthy lifestyle behaviors appear to protect females in professional and associate professional occupations from overweight and obese.

Competing interests

The authors declare that they have no competing interests.

Financial disclosure statement

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