Original Article

Maternal and Perinatal Outcome of High Maternal BMI in Pregnancy among Admitted Cases in Ad-din Women's Medical College and Hospital

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Abstract

Background: Body mass index (BMI) is an important predictor of dietary status, genetics, diseases e;g pre-eclampsia, hypothyroidism, polycystic ovarian syndrome (PCOS),and also physical inactivity. High maternal body mass index is associated with various adverse maternal and perinatal outcomes.

Obesity with high BMI among fertile women is getting epidemic proportions throughout the world. Mothers who are overweight or obese during pregnancy and childbirth are known to be at risk of significant antenatal, intrapartum, postpartum and neonatal complications. So, the aim of the current study was to evaluate the effect of obesity on the maternal and perinatal outcomes in pregnancies complicated by obesity

Objective: To determine the maternal & perinatal outcome in relation with high maternal BMI.

Methodology: A cross sectional study was carried among 150 pregnant women admitted in the Department of Obstetrics and Gynaecology, at Ad-din Women's Medical College and Hospital. Data were collected pre-designed data collection sheet. Data were analysis using statistical package for social science (SPSS) for windows version 20.

Results: In this study total number of cases were 150. Among them 67 mothers were between 26-30 years of age. The mean age was 28.32±4.43 years in obese women and 27.50±4.51 in normal BMI women. Among these obese 75 pregnant women, 46 cases (61.3%) had BMI < 35 to 40 and 29 cases (38.7%) had a BMI > 40. Majority with high BMI 71 (94.7%) were caesarean section and only 4(5.3%) were vaginal delivery in obese women. On the other hand in normal BMI 42 (56%) were caesarean section and 33(44%) were vaginal delivery. Pre-eclampsia was seen in morbid obese52 (68.9%) and GDM more in 28 (37.9%). In fetal complication macrosomia was in morbid obese mother 5(6.9%). Asphyxiated baby was delivered in morbid obese 5 (6.9%). Need NICU admission was 10(13.3%).

Conclusion: This study shows high BMI has emerged as maternal complications as well as influencing the birth weight of the baby. Maternal weight should continue to be given importance in monitoring the health of pregnancies.

Keywords: Maternal, Perinatal, Obesity, High BMI, Pre-eclampsia, GDM, DM, Hypothyroidism, Asphyxia, IUGR, Fetal macrosomia.

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Introduction

Body mass index (BMI) is defined as weight in kilograms divided by height in square meters.[1] Both lean and obese women carry a risk for adverse pregnancy outcomes.[1] An increasing BMI is associated with an increased incidence of gestational hypertension, pre-eclampsia, eclampsia, GDM, macrosomia, induction of labour, shoulder dystocia, caesarean deliveries, wound infection, post-partum hemorrhage.[2] The perinatal problems that have been Identified with maternal obesity and pregnancy include an increased risk of neural tube

defects, fetal macrosomia, fetal growth restriction, birth asphyxia, birth trauma and neonatal hypoglycemia.[3,4]

Worldwide there has been a dramatic increase in the prevalence of overweight and obesity in women of child bearing age. In the United States, 34% of women aged 20 to 39 years are obese and 59.5% are classified as overweight or obese.[5] Obesity is a known risk factor for many health problems, including type 2 diabetes mellitus, hypertension, coronary heart disease, and stroke.[6] In addition to these problems, Maternal obesity is associated with increased risk of adverse pregnancy outcome including gestational diabetes melitus, pre-eclampsia, gestational hypertension, macrosomic baby, post-partum haemorrhage, and also increased rate of C-section delivery and the risk of its complications such as wound infection. Furthermore, their obesity may have adversely affected the health of their offspring.[7]In developing Asian countries, such as Iran, women generally have a lower BMI than in developed countries. In the USA, for example, 2% of pregnant women have a BMI < 18.5 and more than 50% have a BMI > 25.[8] Hence, BMI seems to differ across populations. On the other hand pregnancy outcome is worst in babies from mothers with low body mass index as compared to healthy weight mothers with respect to increased incidence of preterm birth, low birth weight and increased neonatal morbidity and mortality on the neonatal ward.[9]So, ideal BMI of a mother during pregnancy is a crucial prerequisite for good maternal and neonatal and as well as future outcome of a child.

Obese women are at greater risk of maternal-fetal complications than women with a normal body mass index (BMI) during pregnancy and childbirth. Obese women are known to be at risk of antenatal, intra-partum, postpartum and neonatal complications as mentioned along with venous thromboembolism and stillbirths.[10]So this study was done to determine the fetomaternal outcome in relation with high maternal BMI.

Materials and methods

It was a cross sectional study carried out at the Department of Obstetrics and Gynaecology, Ad-din Women's Medical College and Hospital, Dhaka, Bangladesh January 2018to December 2018. Pregnant women who were admitted in the Department of Obstetrics and Gynaecology. Total 150 sample were included in this study. 75 mothers with normal BMI and 75 mothers with high BMI with BMI > 35. 75 Mother with high BMI were divided into 2 groups, BMI 35 to <40 were 46 and BMI > 40 were 29. Mothers with high BMI were included in the study. Mothers with chronic liver disease, chronic kidney disease, heart diseases or any other chronic diseases were excluded from the study. Neonate with any congenital malformations were also excluded. Data were collected by using a preformed questionnaire. The purpose of the study was explained to all study population. Relevant history was taken, gestational age was determined by last menstrual period, previous antenatal records were collected, clinical examination was done in all the cases. All this collected information was recorded in a pre-designed data collection sheet. Data were processed and analyzed by using chi-square test and computer software SPSS (Statistical Package for Social Sciences) version 20.

Results

Table I: Age distribution of the patients (n=150)

Age in years	Obese (n=75)		Normal (n=75)		P value
	No	%	No	%	
20-25	22	29.3	24	32.0	
26-30	34	45.3	35	46.7	
31-35	13	17.3	12	16.0	0.597
36-40	6	8.0	4	5.3	
Mean±SD	28.32±4.43		27.50±4.51		

Table II: Gestation age of the patients (n=150)

Gestation age	Obese (n=75)		Normal (n=75)		P value
	No	%	No	%	
34-37 weeks	39	52.0	41	54.7	
38-40 weeks	34	45.3	31	41.3	0.571
>40 weeks	2	2.7	3	4.0	

Table III: Mode of delivery (n=150)

Mode of delivery	Obese (n=75)		Normal (n=75)		P value
	No	%	No	%	
Normal vaginal	4	5.3	33	44.0	0.001
delivery					
LUCS	71	94.7	42	56.0	

Here we can see highly significant number of obese mother went on caesarian section and here p value is highly significant.

Table IV: Maternal complication of the patients (n=150)

Complication	Obese (n=75)		Normal (n=75)		P value
	No.	%	No.	%	
Normal	24	32.0	61	81.3	0.001
Pre-eclampsia	52	69.9	11	14.7	
GDM	28	37.9	3	4.0	
Polyhydramnios	2	2.7	0	00	
Wound infection	2	2.7	00	00	

Significant number of obese mother had different types of complications and here p value is highly significant

Table V: Fetal complication of the patients (n=150)

Complication	Obese (n=75)		Normal (n=75)		P value
	No	%	No	%	
Macrosomia	2	2.7	0	00	
IUGR	8	10.7	2	2.7	
RDS	4	5.3	1	1.3	0.021
PNA	6	8.0	2	2.7	
Asphyxia	2	2.7	0	00	

Significant number of obese mothers had fetal complications and here p value is highly significant

Table VI: Neonatal outcome of the study subjects (n=150)

Neonatal outcome	Obese (n=75)		Normal (n=75)		P value
	No.	%	No	%	
Birth weight					
≤2.5 kg	14	18.7	18	24.0	
>2.5-4 kg	49	65.3	56	74.7	0.036
>4 kg	12	16.0	1	1.3	
Mean±SD	2.95±0.95		2.75±0.42		
Admission in NICU					
Yes	10	13.3	2	2.7	0.031
No	65	86.7	73	97.3	

Significant number of neonates with obese mother needed NICU admission and here p value is highly significant

Table VI: Association of fetal complication and BMI (n=75)

Complication	BMI (≤40) (n=46)		BMI (>40) (n=29)		P value
	No.	%	No.	%	
Macrosomia	3	7.1	8	27.6	0.943
IUGR	5	10.9	3	10.3	0.552
RDS	3	6.5	3	10.3	0.051
PNA	4	8.7	2	6.9	0.780
Asphyxia	0	00	2	6.9	0.071

Significant difference was observed here among the mothers with and BMI (>40) with macrosomia

Discussion

This study found maximum 34(45.3%) were age group 26-30 years followed by 22(29.3%) were 20-25 years, 13(17.3%) were 31-35 years and only 6(8%) were 36-40 years. The mean age was SD 28.32±4.43 years. This finding consisted with another study they found 25.2 years. [11]

Among these 75 pregnant women, 46 cases (61.3%) had BMI < 30 and 29 cases (38.7%) had a BMI > 30. In another study showed among the 205 pregnant women; 121 cases (59%) had normal BMI, 61 cases (29.7%) had overweight, 21 cases (10.2%) had obese 30-34.9 and 3 cases (1.5%) had morbid obese. [12]

This study shows that majority 71(94.7%) were caesarean section and only 4(5.3%) were vaginal delivery in obese women. On the other hand in normal women 42 (56%) were caesarean section and 33(44%) were vaginal delivery, here we can see highly significant number of obese mother went on caesarian section and here p value is highly significant. This finding consistent with Bhushan et al.[13] they reported the risk of cesarean sections and instrumental deliveries increased significantly with increase in high BMI (p=0.002). Sahuet al.[14] and Hincz et al.[15] also reported a significantly higher risk for cesarean delivery in these women (p=0.01). Similarly, Srivastava et al. found a significant risk of cesarean and instrumental deliveries in obese women.[16]

In this study shows pre-eclampsia was seen in morbid obese 39(68.9%) and GDM more in morbid obese 28 (37.9.%). Similar study Sing et al.[12]found pre-eclampsia, as maternal outcome was majorly seen in obese (19.04%) and morbidly obese (66.67%) with p value of 0.001. In another study carried out by Bhattacharya et al.[2] it was found to be 28.2% with p value <0.05. In obese the percentage in another study was 17.07 % compare with 14.7 % and 12.2 % respectively.[2,17]

This study shows macrosomia was in morbid obese mother 8(27.6%) and it is significant statistically. Asphyxiated baby was delivered in morbid obese 5(6.9%). NICU admission mostly seen in morbid obese, 10(13.3%) in this study with significant p value. A large body of data links a high BMI with a number of fetal and maternal complication, including fetal death, preeclampsia, gestational diabetes, macrosomia,[4,5] asphyxia, seizure, hypoglycemia, meconium aspiration syndrome and complicated deliveries. [6, 7, 8]

In this study shows the mean birth weight of babies increased significantly with increase in BMI. Hincz et al and Mazumder et al also found that the mean birth weight of babies increased with the increase in BMI ($p<0.05$).[15,18] Moreover, in the present study the incidence of low birth babies decreased significantly with increase in BMI ($p<0.008$). Sahu et al found the incidence of LBW babies (<2 kgs) to be 19.11% in obese, 14.10% in overweight and 6.82% in the normal BMI group ($p<0.05$).[14]The risk of macrosomia increased significantly with the increase in BMI ($p=0.04$) in the present study. Sahu et al, Hincz et al also found that the risk of macrosomia increased with increase in BMI ($p<0.05$, $p<0.001$ respectively).[14,15]

Conclusion

In the present study, we found that there was a direct relationship between maternal weight and fetal outcome. Increasing BMI is associated with increased incidence of pre-eclampsia, GDM and caesarean delivery. Macrosomia, IUGR, RDS, PNA and asphyxia was higher in morbidly obese mother. Pre-pregnancy weight and BMI is important to consider when determining how much weight need to gain during pregnancy.

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