Original Article

Immediate Outcome of Neonates with High Maternal BMI

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Abstract

Background: Obesity increases morbidity in mothers and fetus and are associated with multifaceted adverse reproductive and neonatal outcomes.

Objective: To determine immediate neonatal outcome from obese /high BMI mother.

Methodology: This cross-sectional study was carried out among 90 pregnant women admitted at the department of obstetrics & gynecology of Ad-din Women's Medical College & Hospital (AWMC&H), Dhaka, over the past 12 months (January- December 2018) period. Data collected on pre-designed data collection sheet were. analyzed using statistical package for social science (SPSS) V. 20.

Results: Most of the mothers (45.6%) belonged to age group 26-30 years followed by 20-25 years (28.9%), 31-35 years (17.8%) and 36-40 years (7.6%). Mean (±SD) age was 28.74±4.51 years. Of all 90 pregnant women, BMI of 54 cases (60%) was <40, and 36 (40%) had >40. Nearly 67% morbid-obese mothers had pre-eclampsia while 39% GDM. Also, 8.3% fetus from obese mothers suffered each from foetal complication/macrosomia &/or asphyxia,14.4% of which essentially requiring NICU.

Conclusion: Findings attest that obesity and high BMI as important maternal factors influencing neonatal complication and birth weight of babies. Health care providers caring pregnant women should determine BMI at an initial pre-natal visit. Individualized care and clinical judgment are essential in the management of under-weight, over-weight and obese women.

Keywords: Neonate, BMI, NICU Macrosomia, IUGR, Asphyxia.

Introduction

Obesity is considered as one of the largest global health problems of 21st century. In the North American regions, 62% of the population over the age of 20 were overweight, abody mass index (BMI) of ≥25 kg/m2), and 26% were obese (BMI ≥30 kg/m2).1,2 In the Europe, the Eastern Mediterranean and the Americas, more than 50% of women were overweight and, of these, about half of overweight women were obese (EU 23%, EM 24% and AM 29% respectively).[1,2] The perinatal problems that have been identified with maternal obesity and pregnancy include an increased risk of neural tube defects, birth asphyxia, birth trauma and neonatal hypoglycemia.[3,4]

Obesity is a known risk factor to develop several non-communicable diseases, including type 2 diabetes mellitus, hypertension, coronary heart disease, and stroke.[5] In addition to these problems, obese women have higher risk of complications during pregnancy and/or delivery. Furthermore, obesity may have adversely affected the health of their offspring.[6] In developing countries, such as Iran, women generally have a lower BMI than in developed countries. Pregnancy outcome is worst in babies from mothers with lower BMI compared to normal BMI which may increase the incidence of preterm birth, lower birth weight of baby, increased neonatal morbidity and mortality. [7]

Moreover, obese women remain at greater risk of maternal-fetal complications during pregnancy and childbirth. Obese women are at risk of antenatal,

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intrapartum, postpartum and neonatal complications such as hypertensive disorders of pregnancy, gestational diabetes mellitus, venous thromboembolism, cesarean section, preterm delivery, fetal macrosomia and stillbirths.[8] So the aim of this study was to examine the immediate neonatal outcome between obese and overweight mother.

Materials and methods

Study design and setting: Cross sectional study on obstetrics & gynecology carried out at the Dept. of AWMCH, Dhaka, Bangladesh.

Study period: One year (January 2018 to December 2018).

Study population: Pregnant women admitted at the Dept. of Obs & Gyne.

Sample size: Total 90 samples were included in this study, randomly.

Data collection process: Data were collected using a pre-structured and pre-tested questionnaire. Following the aim of study, relevant history was taken, gestational age was determined using LMP, antenatal records were collected and clinical checkup were performed on each study woman.

Data management: All collected data were entered into SPSS and analyzed on a computerized software SPSS.V. 20.0 using proportional tests of Chi-square test and/or Fisher's Exact test, as and whenever required for better statistical analysis.

Results

Among pregnant women, 45.6% were 26-30 years of age, 28.9% were 20-25 years of age and 17.8% were 31-35 years of age. Mean age was 29 years (Table-I).

Table 1: Age distribution of the patients (n=90)

Age in years	Frequency (n)	Percent (%)	Mean ± SD
20-25	26	28.9	28.74±4.51
26-30	41	45.6	
31-35	16	17.8	
36-40	7	7.8	

In terms of BMI of pregnant women, more than half were BMI less than 40 and 40% had BMI more than 40 (table II).

Table II : BMI of the patients (n=90)

BMI	Frequency (n)	Percent (%)
≤40	54	60.0
>40	36	40.0

Table III shows, more than half women (57.4%) whose BMI were less than 40 had pre-eclampsia, 40.7% had no complication and 25.9% had Gestational Diabetes Mellitus (GDM). Among pregnant women whose BMI were more than 40, 66.7% had pre-eclampsia, 38.9% had GDM and 16.7% had no complication.

There is a significant difference having no complication between women who had BMI less than 40 than who had BMI more than 40.

Table III: Association of maternal complication and BMI (n=90)

Complication	n (%)	BMI (≤40) (n=54)		BMI (>40) (n=36)		P value
		n	%	n	%	
No complication	28(31.1%)	22	40.7	6	16.7	0.027
Pre-eclampsia	51(56.7%)	31	57.4	24	66.7	0.084
GDM	28(31.1%)	14	25.9	14	38.9	0.265
Polyhydramnios	3(3.3%)	1	1.9	2	5.6	0.637
Wound infection	3(3.3%)	0	0.0	3	8.3	0.031

Total will not correspond to 100% because of multiple complications in individual patients

Table 4: Association of fetal complication and BMI (n=90)

Complication	n (%)	BMI (≤40) (n=54)		BMI (>40) (n=36)		P value
		n	%	n	%	
Macrosomia	3(3.3%)	0	0.0	3	8.3	0.031
IUGR	9(10%)	6	11.1	3	8.3	0.943
RDS	5(5.6%)	2	3.7	3	8.3	0.552
PNA	8(8.9%)	5	9.3	3	8.3	0.780
Asphyxia	3(3.3%)	0	0.0	3	8.3	0.031

In terms of fetal complication, among pregnant women who had BMI less than 40, 11.1% had IUGR, 3.7% had RDS and 9.3% had PNA, respectively. Among women who had BMI more than 40, 8.3% had IUGR, 8.3% had RDS and 8.3% had PNA (table 4).

Table 5 shows, among all pregnant women, 18.9% delivered children with low birth weight, 65.6% delivered baby within 2.5 – 3.5kg and 15.6% had baby with more than 3.5kg. Among these children, 14.4% were admitted to NICU upon delivery.

Table V : Neonatal outcome of the study subjects (n=90)

Neonatal outcome	Frequency (n)	Percent (%)
Birth weight		
≤2.5 kg	17	18.9
>2.5-3.5 kg	59	65.6
>3.5 kg	14	15.6
Mean±SD	2.87±0.89	
Admission in NICU		
Yes	13	14.4
No	77	85.6

Discussion

Maternal obesity is associated with fetal macrosomia, IUGR and neonatal asphyxia. This study finding were discussed and compared with previously published relevant studies.

This study shows 45.6% were the age group 26-30 years followed by 28.9% were 20-25 years, 17.8% were 31-35 years and only 7.8% were 36-40 years. The mean age was SD 28.74±4.51 years. These findings consisted with Kumari et al.[11]

This study showed, pre-eclampsia was seen in morbid obese (66.7%) and GDM more in morbid obese (38.9%). Similar study found pre-eclampsia, as maternal outcome was majorly seen in obese (19.04%) and morbidly obese (66.67%) with $p < 0.001$[10-11]. Several studies had found that preeclampsia was found to be statistically significant with women with high body mass index (BMI) 001.[10-12]

In this study we have found macrosomia was present in morbid obese mother (8.3%). Asphyxiated baby was delivered in morbid obese (8.3%). NICU admission mostly seen in morbid obese. Several studies found that there is a association between high BMI with number of fetal and maternal complication, including fetal death, preeclampsia, gestational diabetes, macrosomia,[4] asphyxia, seizure, hypoglycemia, meconium aspiration syndrome and complicated deliveries. [5, 6, 7]

Our 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 ($p<0.05$).[13,14] Moreover, in the present study the incidence of low birth weight among 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 ($p<0.05$).[15] 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 increasing risk of macrosomia is highly significant with increase in BMI).[13]

Conclusion

This study suggested that maternal obesity is critically important to neonatal health during the perinatal period. High BMI is associated with increased incidence of pre-eclampsia, GDM and caesarean delivery. Macrosomia, IUGR, RDS, PNA and asphyxia was higher in morbid obese. Management of weight during pregnancy might help reduce their adverse neonatal outcomes in future intervention studies or programs.

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