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Assess Maternal Outcomes During Labor and the Immediate Postpartum Period in Overweight Mothers

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Abstract

Background: Maternal obesity in pregnancy is generally recognized as one of the most common risk factors for unfavorable maternal and neonatal outcomes. Obesity has become a prominent issue in obstetrics practice. ***Objective:*** To evaluate the maternal outcomes during labor and the immediate postpartum period in overweight mothers. ***Materials and Methods:*** This cross sectional analytical study was conducted on the admitted patients with full term singleton pregnancy in labour in the Department of Obstetrics & Gynecology of Sir Salimullah Medical College and Mitford Hospital from July 2020 to January 2021. A total of 150 pregnant women with full term singleton pregnancy in labour were selected fulfilling the inclusion and exclusion criteria. Informed written consent was taken from each respondent. All data relevant to variables of the study was collected in a data collection sheet. ***Results:*** Caesarean section rates were considerably higher in overweight/obese patients compared to the normal weight group (p=0.002). The overweight/obese group had atonic PPH (p=0.04). Macrosomia neonate was substantially higher in the overweight/obese mother group than in the normal weight group (OR=10.09, p=0.009). Overweight/obese individuals had significantly increased rates of low APGAR scores (<7 at 1 minute) (p=0.041). The overweight/obese group had slightly increased rates of intrauterine mortality, stillbirth, and low APGAR score (<7 at 5 minutes), although the differences were not statistically significant (p=0.315, p=0.311, and p=0.190). Macrosomia necessitated neonatal critical care, and moms who were overweight or obese had a 4.03 times higher risk (OR=4.43, p=0.026). The obese neonates had a substantially higher mean birth weight (3.22±0.54 kg) compared to the control group (2.95±0.46 kg). ***Conclusion:*** Postpartum pregnancy problems such as atonic PPH have been described in overweight or obese pregnant mothers. Increased birth weight, stillbirth, macrosomia, and NICU hospitalizations were also identified in the overweight/obese population.

Keyword: Postpartum pregnancy, overweight, maternal outcome, fetal outcome.

INTRODUCTION

The immediate postpartum period carries significant risks for complications such as postpartum hemorrhage and sepsis. Postpartum monitoring, including taking vital signs and monitoring blood loss, is important for the early identification and management of complications [1]. The prevalence of overweight and obesity among women at reproductive age is increasing [2]. The prevalence of overweight and obesity is quite difference among races and ethnicities, and there might be different on the risk of perinatal complications [3]. Obesity in pregnancy is one of the important challenges in obstetric services given the prevalence and potential adverse effects on the mother and fetus. Obesity in pregnancy is a high-risk obstetric condition that requires special attention [4]. Obesity is a pandemic problem found in many countries. It is estimated that, in 2025, more than 21% of women in the

world will suffer from obesity [4] bese women have a higher risk of developing gestational diabetes mellitus, gestational hypertension, preeclampsia, venous thromboembolism, postpartum hemorrhage, cesarean delivery, and maternal death [5,6]. The mother's pre-pregnancy body mass index and pregnancy weight gain can directly affect both maternal and birth outcomes [7]. Studies conducted in different regions of Iran have shown that pregnancy weight gain and pre-pregnancy body mass index can lead to adverse pregnancy outcomes [8–10]. Women with obesity and their fetuses are at a higher risk of miscarriage, stillbirth, Preeclampsia, large fetus for gestational age, gestational diabetes, premature delivery, cesarean delivery, meconium aspiration, and respiratory distress during pregnancy and delivery [11–13]. Maternal obesity can also lead to congenital abnormalities such as neural tube defects and abnormal intrauterine growth, which can have lifelong side effects, including obesity in the growing child [14]. Additionally, obesity is an independent predictor of longer hospital stays following complicated deliveries. Therefore, it is crucial to find definitive solutions to treat obesity and its complications, especially during pregnancy [15].

It is therefore not surprising that obesity is associated with increased rates of maternal and perinatal morbidity and mortality. Despite these problems, there remains a lack of awareness of both the range and severity of the problems associated with obesity in pregnancy. So the purpose of this study to evaluate and compare the fetomaternal outcome in patient belonging to different BMI.

MATERIALS AND METHODS

A Cross sectional analytical study was conducted Department of Obstetrics and Gynaecology, Sir Salimullah Medical College Mitford Hospital, Dhaka. A total of 150 women were enrolled in this study, and categorized overweight/obese and normal BMI accordingly. Purpose and procedure of study was discussed with the patients. Then a written informed consent was obtained from each patient or from person authorized guardian before patient's participation in the study. Each patient was interviewed face to face by using semi structured interview schedule in which sociodemographic variables, examination findings and after that labour outcome related variables were recorded in checklist. Patients were monitor during labour and early puerperium. Labour and delivery outcome variables and associated data were recorded in structured questionnaire form and checklist. Fetal outcomes were assessed by using APGAR score, birth weight, birth trauma and asphyxia, referral to neonatal unit, perinatal mortality. Collected data were checked very carefully to identify any error in collecting data. Data processing work was consisted of editing, coding and computerization, preparation of tables, analysis and matching of data. The technical matter of editing, coding and computerization was looked after by self. A single form was allocated for a single patient. Statistical analyses were carried out by using the Statistical Package for Social Sciences version 26.0 for Windows (SPSS Inc., Chicago, Illinois, USA). The mean values were calculated for continuous variables. The qualitative observations were indicated by frequencies and percentages. The differences between groups were analyzed by appropriate statistical test of significance. Chi-square test was used to compare categorical data. A "p" value <0.05 was considered as significant.

RESULTS

Table 1 showed the age distribution of the study respondents, 16(10.7%) parturient of age <20 years, 44.7% parturient of age between 21-25 years, 36.7% parturient of age between 26-30 years of age and 8% of parturient were in 31-35 years of age. The mean age the parturient was 26.75±5.47 years with range 18-35 years. Table 2 showed the BMI distribution of the study patients. Within our study population 50.0% of pregnant women were categorised as normal weight (8.5-24.9 Kg/m2), 42.72% as overweight (25-29.9 Kg/m2) and 7.3% as obese (25-29.9 Kg/m2). Study comprising of 75 overweight/obese pregnant women as study group (BMI >25 kg/m2) and 75 non-obese pregnant women as control group (BMI 18.5 -24.9 kg/m2). Table 3 showed the mean gestational age in two groups, statistically no significant difference of mean gestational age between two groups (p<0.001). Table 4 showed the onset of labour of the study respondents. Induction of labour significantly. Figure I showed mode of delivery of the studied respondents, caesarean section was significantly higher in overweight/obese compare to normal weight group (p=0.002). Table 5 shows the incidence of atonic post-partum hemorrhage was significantly higher in the overweight/obese (p=0.04). Traumatic post-partum hemorrhage and puerperal sepsis were not statistically significant between overweight/obese and normal weight group (p>0.05). Table 6 showed the neonatal outcome of the study respondents. Neonates born to overweight/obese mothers had higher birth weight in comparison to neonates of normal weight women. Low birth weight babies significantly higher in normal weight group compare to overweight/obese group (p=0.001) and macrosomia neonate significantly in overweight/obese mother compare to normal weight group (OR= 10.09, p=0.009). Low APGAR score (<7 at 1 minutes) was significant higher in overweight/obese group (p=0.041). Regarding intrauterine death, still born and low APGAR score (<7 at 5 minutes) were slightly higher in overweight/obese group but results were not statistically significant (p=0.315, p=0.311and p=0.190 respectively). Requirement of neonatal intensive care due to macrosomia and overweight/obese mothers had 4.03 times more chance (OR=4.43. p=0.026).

Table-1: Distribution of the study subjects according to age (n=150)

Age group (years)	No. of patients	Percentage (%)
<20	16	10.7
21-25	67	44.7
26-30	55	36.7
31-35	12	8.0
Total	150	100.0
Mean±SD Range	26.75±5.47 (18-35) years	

Table 2: Distribution of the study subjects according to BMI (n=150)

BMI (kg/m^2)	No. of patients	Percentage (%)
Normal weight (18.5-24.9)	75	50.0
Overweight (25-29.9)	64	42.7
Obese (30-34.9)	11	7.3
Total	150	100.0

Table 3: Comparison of gestational age (weeks) between two groups (N=150).

Gestational age (weeks)	Body weight (Kg/m^2)		p value
	Normal weight (n=75)	Overweight/Obese (n=75)	
Gestational age (weeks)	39.15±1.26	39.74±1.18	0.091^{ns}

Table 4: Onset of labour between two groups (N=150)

Onset of labour	Body weight (Kg/m^2)				p value
	Normal weight (n=75)		Overweight/Obese (n=75)		
	n	%	n	%	
Spontaneous	66	88.0	54	72.0	0.014^{s}
Induced	9	12.0	21	28.0	
Total	75	100.0	75	100.0	

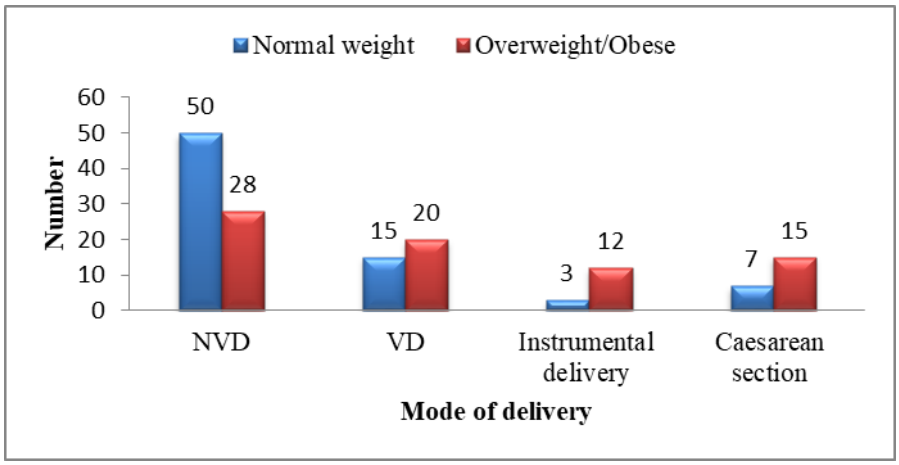

Figure I: Association of mode of deliver between two groups (N=150).

Table 5: Post-partum complications and its relation with BMI (n=150)

Postpartum complication	Body weight (Kg/m^2)				p value
	Normal weight (n=75)		Overweight/Obese (n=75)		
	n	%	n	%	
Atonic PPH	4	5.33	24	32.00	0.040^{s}
Traumatic PPH	5	6.67	6	8.00	0.121^{ns}
Puerperal sepsis	1	1.33	2	2.67	0.688^{ns}
No complication	65	86.67	43	57.33	
Total	75	100.0	75	100.0	

Table 6: Association of fetal outcome between two groups (N=150).

Fetal outcome	Body weight (Kg/m^2)				p value
	Normal weight (n=75)		Overweight/Obese (n=75)		
	n	%	n	%	
Mean Birth weight (kg)	2.95±0.46		3.22±0.54		<0.001^s
LBW (<2.5kg)	12	16.0	1	1.3	0.001^s
Normal weight (2.5-4.0kg)	62	82.7	65	86.7	0.497^{ns}
Macrosomia (>4.0kg)	1	1.3	9	12.0	0.009^s
Live born	74	98.7	71	94.7	0.172^{ns}
Still boron	1	1.3	3	4.0	0.311^{ns}
IUD	0	0.0	1	1.3	0.315^{ns}
APGAR score < 7 at 1min	7	9.3	16	21.3	0.041^s
APGAR score < 7 at 5min	3	4.0	7	9.3	0.190^{ns}
NICU admission	7	9.3	17	22.7	0.026^s

DISCUSSION

As per the results out of 150 patients, total 10.7% of patients were in the age group of 18-20 years, 44.7% of patients were in the age group 21-25 years, 34.7% of patients were in the age group 26-30 years and 8.0% of patients were in the age group of 31-35 years. The mean age of patients in the study was 26.75±5.47 years which reflects the average reproductive age of women. In accordance Kumar and Chellamma [16] reported 72 (65.45%) patients were in the age group of 21-30 years, which reflects the normal child bearing age group of women.

In present study showed mean maternal weight (kg) of normal weight group was 53.73±4.74 and in overweight/obese group 78.12±5.47. The mean BMI of normal weight group was 23.21±0.89kg/m^2 and in overweight/obese group 28.16±1.41 kg/m^2. Maternal weight and BMI significantly increased in overweight/obese group compare to normal weight group (p<0.001). Sharma *et al.,* [17] reported the mean weight and BMI at booking for obese women was 81.40(±6.78) kg and 31.48(±1.26) kg/m2 which was statistically significant in comparison with normal BMI women (p<0.0001). Another study by Alves *et al.,* [18] reported a significant difference in the BMI at booking (p<0.001) of obese and normal weight women.

In present study showed the incidence of atonic post-partum hemorrhage was significantly higher in the overweight/obese (p=0.04). Traumatic post-partum hemorrhage and puerperal sepsis were not statistically significant between overweight/obese and normal weight group (p>0.05), which was more in comparison with previous studies by Vellanki *et al.,* [19] and Kumari *et al.,* [20] Vijay *et al.,* [21] reported linear increase in maternal blood loss at delivery with increasing weight of pregnant women. There is an increased prevalence of puerperal sepsis due to various causes like wound infection, genitor-urinary tract infections and associated morbidity. Paiva *et al.,* [22] observed that maternal obesity during late pregnancy is independently associated with postpartum infectious complications.

In our study, the mean birth weight of the neonates of obese group was 3.22±0.54 kg which was significantly higher (p<0.001) than the neonates of control group where it was 2.95±0.46kg. Neonates of obese mothers had increased NICU admission, the major reasons for admission being infants of diabetic mothers and macrosomia. In present study macrosomia significantly higher with OR 10.09(1.24-81.8, p=0.009) in overweight/obese mother compare to normal weight group. The results are concurrent with previous studies by Usha *et al.,* [23] and Vasudevan *et al.,* [24].

Various studies have found an association of low apgar score at birth, neonatal admissions and increased incidence of perinatal deaths among obese pregnant women which was comparable with our findings [21] The impact of abnormal body habitus on birth weight of the baby grows as the maternal BMI increases according to various studies [25]. The findings in our study showing the increased incidence of macrosomia in obese women was consistent with these studies.

In our study, we have found out that normal weight mothers are associated with increased risk of giving birth to LBW babies. This is consistent with other studies such as Han *et al.,* [26] and Kanadys [27] Kuamr and Chellamma [16] shown that macrosomia or babies with higher birth weight is common in obese and overweight women, which consistent with present study. Maternal overweight/obese is significantly associated with an increased risk of macrosomia, low APGAR score, NICU admission.

CONCLUSION

Overweight/obese during pregnancy carries high maternal and fetal risks. Increase in the need for induction of labor, instrumental delivery, caesarean section were associated with pregnancies complicated with overweight/obese. Birth injuries were significantly

in overweight/obese group. Postpartum pregnancy complications like atonic PPH, reported in overweight/obese pregnant women. Increased birth weight, stillbirth, macrosomia and higher NICU admissions was also found in overweight/obese group

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