

A Clinical Study of Maternal and Neonatal Outcomes in Pregnant Women with Obesity (BMI >30) at a Tertiary Care Hospital

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ABSTRACT

Background: The increasing prevalence of obesity among women of childbearing age is a significant concern as it poses additional risks for both the mother and baby. This study aims to investigate the maternal and neonatal outcomes in pregnant women with obesity (BMI > 30) at a tertiary hospital to improve management strategies for this patient population.

Methods: This study was a prospective observational study conducted at LD Hospital, Department of Obstetrics and Gynaecology, GMC Srinagar. The study included pregnant women with gestational age more than 28 weeks, BMI more than 30, delivering at the study hospital, and willing to participate. Detailed history and examination were performed, and data were documented. The women were followed up to delivery and postpartum until discharge, and their outcomes were studied. Data were collected using Microsoft Excel, and statistical analysis was performed using descriptive statistics.

Results: Of the 130 patients, the majority were between 20-25 years of age, primi gravida, and had a BMI between 30-34.9 kg/m². Gestational age ranged from 32-34 weeks to over 37 weeks. The most common event was preterm labor, affecting 19.2% of patients, followed by PPH, affecting 6.9% of patients. The least common event was eclampsia, affecting only 1.5% of patients. The majority of neonates had a weight in the range of 2.5-2.9 Kg, accounting for 65.4% of neonates. Only a small proportion of neonates had a birth weight less than 2.5 Kg (5.4%). The Apgar score, which measures the health of a

newborn immediately after the birth, was less than 7 for 5.4% of neonates, while 94.6% of neonates had an Apgar score greater than or equal to 7.

Conclusion: The study results emphasize the need for appropriate management strategies for obese pregnant women to reduce adverse outcomes. Early identification, close monitoring, and tailored interventions are crucial to reduce the risks associated with maternal obesity.

Keywords: obese pregnant women, BMI >30kg/m², gestational hypertension, preeclampsia, gestational diabetes mellitus

INTRODUCTION

The prevalence of obesity has been on the rise globally, which has been identified as a significant public health concern by the World Health Organization. Based on the 2012 World Health Statistics survey report by WHO, it was found that one in every six individuals globally is obese, and approximately 2.8 million people die annually due to a high body mass index (BMI) and associated complications.¹ The report also highlighted that from 1976 to 2016, the proportion of adult women aged 20 years and above with obesity rose from 6% to 15% worldwide.² These statistics indicate the growing prevalence of obesity globally and emphasize the need for effective interventions to manage and prevent obesity-related health risks. Of

particular concern is the increasing prevalence of obesity among women of childbearing age, as obesity during pregnancy can pose additional risks for both the mother and baby. Maternal obesity, defined as a body mass index (BMI) of more than 30, is associated with adverse outcomes for both the mother and neonate during pregnancy and delivery.³ These adverse outcomes include gestational diabetes, hypertension, pre-eclampsia, preterm birth, cesarean delivery, and increased neonatal morbidity and mortality. Although pregnancy is commonly viewed as a natural and healthy phase of a woman's life, however, existing maternal health conditions or those that arise during pregnancy and the postpartum period can turn the pregnancy into a high-risk one. A pregnancy is considered high-risk when the possibility of an unfavorable outcome for the mother or the child is increased beyond the baseline risk of that event in the general population due to one or more identifiable risk factors.⁴⁻⁵ Therefore, it is essential to recognize obesity as an obstetric risk factor and implement appropriate management strategies before, during, and after pregnancy. This study aims to investigate the maternal and neonatal outcomes in pregnant women with obesity (BMI > 30) at a tertiary hospital, with the goal of improving management strategies for this patient population.

METHODS

This study was a prospective observational study conducted at LD Hospital, Department of Obstetrics and Gynaecology, GMC Srinagar. The study period was from April (2021) to March (2022), and it was approved by the institutional ethics committee. The inclusion criteria for the study were pregnant women

with gestational age more than 28 weeks, BMI more than 30, delivering at the study hospital and willing to participate. Exclusion criteria included women with anomalous babies, IUFD, BMI less than 30kg/m², and those who did not provide consent. After obtaining written informed consent, detailed history and examination were performed, and data were documented in a case report form. The women were followed up to delivery and postpartum until discharge, and their outcomes were studied. Maternal BMI was determined at admission to the labor room, and relevant investigations were done. The decision for induction of labor or spontaneous progress of labor was made based on maternal and fetal risk. During labor, standard obstetric care was provided, and 2nd stage of labor was monitored carefully, with the decision for instrumental delivery taken accordingly. Neonatologists were present during each delivery and examined and managed the baby soon after delivery. All high-risk obese mothers who delivered vaginally or underwent instrumental delivery were monitored for 5 days and discharged on day 5. Obese mothers who underwent Caesarean section were monitored and discharged on day 7 if the wound site was healthy. Standard postnatal care was provided, and proper breastfeeding techniques were advised. Data were collected and compiled using Microsoft Excel, and statistical analysis was performed using descriptive statistics.

Statistical Methods: The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as Mean±SD and categorical variables were summarized as frequencies and percentages.

RESULTS

In this section, the results of the study will be described:

Variable	Number	Percentage	
Age (Years)	20-25 Years	61	46.9
	26-30 Years	32	24.6
	31-35 Years	25	19.2
	> 35 Years	12	9.2
Gravida	Primi gravida	67	51.5
	Gravida 2	24	18.5
	Gravida 3	30	23.1
	Gravida 4 and above	9	6.9
BMI (Kg/m ²)	30-34.9	107	82.3
	35-39.9	17	13.1
	≥ 40	6	4.6
Gestational age (Weeks)	32-34 Weeks	6	4.6
	35-37 Weeks	16	12.3
	> 37 Weeks	108	83.1

The table 1 displays the distribution of patients according to their age, gravida, BMI, and gestational age. The age of patients ranges from 20-25 years to over 35 years, with the majority falling between 20-25 years (46.9%). About half of the patients (51.5%) were primi gravida. Most patients had a BMI in the range of 30-34.9 kg/m² (82.3%), while only a small proportion had a BMI greater than or equal to 40 (4.6%). Gestational age ranged from 32-34 weeks to over 37 weeks, with the majority of patients being over 37 weeks (83.1%).

Variable	Number	Percentage
Severe anaemia	24	18.5
Preeclampsia	32	24.6
Previous LSCS	28	21.5
Gestational diabetes mellitus	19	14.6
Gestational hypertension	14	10.8
Placenta previa	2	1.5
History of DVT	1	0.8
Oligohydramnios	3	2.3

The table provides the number and percentage of patients who experienced different antenatal events during their antenatal period. The most common event was preeclampsia, affecting 24.6% of patients, followed by severe anaemia affecting 18.5% of patients. The least common event was oligohydramnios, affecting only 2.3% of patients.

Variable	Number	Percentage
Preterm labor	25	19.2
PPH	9	6.9
Abruptio placenta	7	5.4
Malpresentation Breech	6	4.6
Eclampsia	2	1.5

Table 3 provides information on intrapartum events among the study patients. The table lists variables such as preterm labor, PPH (postpartum hemorrhage), abruptio placenta, malpresentation breech, and eclampsia. The table shows the number and percentage of patients who experienced each event during their labor and delivery. The most common event was preterm labor, affecting 19.2% of patients, followed by PPH, affecting 6.9% of patients. The least common event was eclampsia, affecting only 1.5% of patients.

Mode of delivery	Number	Percentage
Vaginal delivery	80	61.5
LSCS	42	32.3
Instrumental delivery	8	6.2
Total	130	100

The table shows the number and percentage of patients who underwent each mode of delivery. The majority of patients had a vaginal delivery, accounting for 61.5% of the total number of patients. LSCS was the second most common mode of delivery, accounting for 32.3% of patients. A small proportion of patients underwent instrumental delivery, which accounted for 6.2% of patients.

Table 5: Birth weight and Apgar score of study neonates

Variable		Number	Percentage
Birth Weight (Kg)	< 2.5 Kg	7	5.4
	2.5-2.9 Kg	85	65.4
	≥ 3.0 Kg	38	29.2
Apgar score	< 7	7	5.4
	≥ 7	123	94.6

In terms of birth weight, the majority of neonates had a weight in the range of 2.5-2.9 Kg, accounting for 65.4% of neonates. Only a small proportion of neonates had a birth weight less than 2.5 Kg (5.4%). The Apgar score, which measures the health of a newborn immediately after the birth, was less than 7 for 5.4% of neonates, while 94.6% of neonates had an Apgar score greater than or equal to 7.

Table 6: Neonatal variables

Variable	Number	Percentage
Infant of diabetic mother	32	24.6
Preterm	21	16.2
Meconium aspiration	6	4.6
Macrosomia	5	3.8
Asphyxia	3	2.3
IUGR	2	1.5

The most common neonatal variable was infant of diabetic mother, accounting for 24.6% of neonates, followed by preterm birth, accounting for 16.2% of neonates. The least common variables were IUGR and asphyxia, affecting only 1.5% and 2.3% of neonates, respectively.

DISCUSSION

In our study, the majority of obese pregnant women belonged to the age group of 20-25 years (46.9%), which is consistent with the findings of Mohan et al, where most of the obese individuals were in the age group of more than 20 years. This indicates that obesity is affecting women at a young age, which can have long-term implications for their health and the health of their offspring.⁷ Our study also found that more than half of the patients were primigravida (51.5%), which is similar to the findings of a study conducted by Kominiarek et al, where they reported that 53.7% of obese pregnant women were primigravida.⁸ This suggests that first-time pregnancies may be at a higher risk for complications in obese

women. The majority of patients in our study had a BMI in the range of 30-34.9 kg/m² (82.3%), while only a small proportion had a BMI greater than or equal to 40 (4.6%). This is consistent with the findings of a study conducted by Kominiarek et al, where they reported that 78.9% of obese pregnant women had a BMI in the range of 30-39.9 kg/m².⁸ However, it is important to note that even patients with a BMI in the range of 30-34.9 kg/m² are at an increased risk of adverse maternal and neonatal outcomes. Gestational age ranged from 32-34 weeks to over 37 weeks in our study, with the majority of patients being over 37 weeks (83.1%). This suggests that obese pregnant women may have a higher risk of post-term pregnancies, which can lead to complications during delivery. The present study found that preeclampsia was the most common event affecting obese pregnant women with a BMI more than 30, with a prevalence of 24.6%, which is consistent with the findings of previous studies.^{9,10} Preeclampsia is a serious pregnancy complication characterized by high blood pressure and damage to organs, and can lead to maternal and fetal morbidity and mortality. Obese pregnant women have a higher risk of developing preeclampsia due to increased inflammation, insulin resistance, and oxidative stress.¹¹ Severe anemia was found to be the second most common event in the study, affecting 18.5% of patients. Anemia during pregnancy can lead to adverse outcomes such as low birth weight, preterm birth, and maternal mortality.¹² Obese pregnant women are at a higher risk of developing anemia due to the increased demand for iron and folic acid and inadequate nutrient intake.¹³ We observed that preterm labor was the most common event affecting 19.2% of patients, followed by postpartum hemorrhage (PPH), which affected 6.9% of patients. The study also reported that the least common event was eclampsia, affecting only 1.5% of patients these findings are compatible with the findings of Sosa et al.¹⁴ The mode of delivery is an important factor in

determining maternal and neonatal outcomes in obese women. In the present study, the majority of women with a BMI of more than 30 delivered vaginally, accounting for 61.5% of the total number of patients. This finding is consistent with the results of several previous studies that have reported that vaginal delivery is the most common mode of delivery in obese women.^{15,16} LSCS was the second most common mode of delivery in the present study, accounting for 32.3% of patients. This is a higher rate than that reported in previous studies, which have reported rates of LSCS ranging from 10% to 30% in obese women.^{17,18} The higher rate of LSCS in the present study may be due to the fact that the study was conducted at a tertiary hospital, where the threshold for performing LSCS may be lower than in other settings. Instrumental delivery was the least common mode of delivery in the present study, accounting for only 6.2% of patients. In the present study, the majority of neonates had a birth weight in the range of 2.5-2.9 Kg, accounting for 65.4% of neonates. These findings are consistent with a study conducted by Mohan et al., which also reported a comparable distribution of birth weight in neonates of obese mothers.⁷ However, in contrast to our study, a study by Lutsiv et al. (2015) reported a higher proportion of neonates with birth weight greater than 4 Kg among obese women.¹⁹ Furthermore, only a small proportion of neonates had a birth weight less than 2.5 Kg (5.4%). This finding is in agreement with a study by Catalano et al. (2015), which showed that obesity in pregnancy was not associated with an increased risk of low birth weight.²⁰ The Apgar score, which measures the health of a newborn immediately after the birth, was less than 7 for 5.4% of neonates, while 94.6% of neonates had an Apgar score greater than or equal to 7. These findings are consistent with a study by Galtier-Dereure et al. (2013), which reported no significant difference in the Apgar score between neonates born to obese and non-

obese mothers.²¹ Maternal obesity is associated with an increased risk of adverse maternal and neonatal outcomes. We observed that the most common neonatal variable associated with maternal obesity is infant of diabetic mother (IDM), accounting for 24.6% of neonates. Preterm birth is the second most common variable, affecting 16.2% of neonates. The least common variables were IUGR and asphyxia, affecting only 1.5% and 2.3% of neonates, respectively. These findings are consistent with previous studies that have shown an increased risk of gestational diabetes and preterm birth among obese pregnant women.^{22,23} These findings suggest that careful monitoring and management of obese pregnant women can result in favorable neonatal outcomes.

CONCLUSION

This study found that the majority of obese pregnant women belonged to the age group of 20-25 years and were primigravida, which suggests that first-time pregnancies may be at a higher risk for complications in obese women. The majority of patients had a BMI in the range of 30-34.9 kg/m², and even patients with a BMI in this range were at an increased risk of adverse maternal and neonatal outcomes. Obese pregnant women had a higher risk of developing preeclampsia, severe anemia, and preterm labor, which can lead to maternal and fetal morbidity and mortality. The mode of delivery is an important factor in determining maternal and neonatal outcomes in obese women, and the majority of women with a BMI of more than 30 delivered vaginally. In contrast, a higher rate of cesarean section delivery was observed in this study, which may be due to the fact that the study was conducted at a tertiary hospital, where the threshold for performing cesarean section may be lower than in other settings. Neonates born to obese mothers had a birth weight in the range of 2.5-2.9 Kg, and a small proportion had a birth weight less than 2.5 Kg. The study concluded that maternal obesity is

associated with an increased risk of adverse maternal and neonatal outcomes and highlighted the need for early identification of obese pregnant women and comprehensive management to minimize the risk of complications.

Declaration by Authors

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