



## Original Article

# Maternal and Neonatal Outcomes among Obese Pregnant Women in Tertiary Care Hospital, Jodhpur: A Retrospective Study

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## Abstract

**Background:** Obesity is an expanding health problem worldwide. Pregnant obese women are predisposed to many pregnancy complications such as gestational diabetes mellitus, pregnancy-induced hypertension, preeclampsia, induction of labor, preterm labor, preterm birth, increase rate of caesarean section, postpartum haemorrhage, anaemia, urinary tract infection, wound infection, and prolonged pregnancy

**Objective:** To find out the incidence of maternal and perinatal outcome in obese pregnant patients in a tertiary care hospital

**Material and Methods:** A retrospective study was conducted in the Department of Obstetrics and Gynecology, Umaid Hospital. A total of 150 obese pregnancies were recorded during the period of six months. Women were categorized into 3 classes based on the BMI. Class I: 30-34.9 kg/m<sup>2</sup>, Class II: 35-39.9 kg/m<sup>2</sup>, Class III: >40 kg/m<sup>2</sup>. The maternal and perinatal outcome of the subjects evaluated in relation to body mass index.

**Results:** A total of 150 women were included in the study fulfilling the inclusion criteria with BMI >30 kg/m<sup>2</sup>. Out of 150 women 82 women had preeclampsia, 14 women had gestational diabetes mellitus. 39 women were post term. 8 women had IUGR. 5 women had preterm labor. Oligohydramnios were seen in 24 women. Out of 150 women, 67 delivered vaginally while 83 by LSCS. Post-partum haemorrhage was encountered in 13 women (8.6%) while 6 women had cervical tear, 8 women had wound gaping postoperatively and 2 women developed peripartum cardiomyopathy. Out of 150 babies delivered 42 needed NICU admissions due to low APGAR scores. Macrosomia was seen in 28 babies.

**Conclusion:** As the BMI increases pregnancy is more likely to get complicated. Obstetrical care providers must counsel their obese patients regarding the risks and complications conferred by obesity and the importance of weight loss.

**Keywords:** Body Mass Index, Maternal Outcome, Obesity, Perinatal Outcome.

## Introduction

Obesity is an expanding health problem worldwide. World Health Organisation (WHO) defines obesity as abnormal or excessive fat accumulation that may impair health with body mass index (BMI) of  $30 \text{ kg/m}^2$  or more as obese among adults<sup>1</sup>. It was recognized as a risk factor in pregnancy more than 50 years ago<sup>2,3</sup>, which increases the risks of maternal and perinatal complications<sup>3-5</sup>.

Pregnant obese women are predisposed to many pregnancy complications such as gestational diabetes mellitus, pregnancy-induced hypertension, preeclampsia, induction of labor, preterm labor, preterm birth, increase rate of caesarean section, postpartum haemorrhage, anaemia, urinary tract infection, wound infection, and prolonged pregnancy<sup>6-8</sup>. Additionally, it can be associated with increased risk for shoulder dystocia, fetal macrosomia, perinatal death, fetal birth defects and admission to neonatal intensive care unit<sup>7,8</sup>. Increase in weight during pregnancy can lead to a change in pregnant BMI class's and it can be related to an increase risk of antepartum, intrapartum and postpartum complication<sup>10</sup>.

Overweight and obese women are more likely to be induced and require a caesarean. Infants of overweight and obese mothers are often macrosomic and require prolonged hospital admissions<sup>11,12</sup>. It has been estimated that the cost of prenatal care in overweight women exceeds that of normal-weight control subjects by 5.4 to 16.2-fold depending on the degree of obesity<sup>13</sup>. Therefore we conducted a study to find out the incidence of Maternal and perinatal outcome in obese pregnant patients in a tertiary care hospital

## Material and Methods

**Study Population:** A retrospective study was conducted in the Department of Obstetrics and Gynecology, Umaid Hospital under Dr S N Medical College, Jodhpur, Rajasthan over a period of six months from March 2020 to August 2020. There were 150 obese pregnant women were

enrolled from gynaecological outpatient clinic of Umed Hospital. The study was approved by the Institute Ethics Committee.

**Methodology:** A total of 150 obese pregnancies were recorded during the period of six months. All women under study were subjected to a detailed history as per the preset proforma including age, address, chief presenting complaint, gravidity, gestational age, outcome of previous pregnancies, menstrual history were noted for each case.

Women were categorized into three groups according to their body mass index (BMI) which was calculated using hospital data from their first antenatal visit: normal (BMI  $18.5\text{-}24.9 \text{ kg/m}^2$ ); overweight (BMI  $25\text{-}29.9 \text{ kg/m}^2$ ) and; obese (BMI greater than  $30 \text{ kg/m}^2$ )

Subjects were categorized into 3 classes based on the BMI.

- Class I:  $30\text{-}34.9 \text{ kg/m}^2$
- Class II:  $35\text{-}39.9 \text{ kg/m}^2$
- Class III:  $>40 \text{ kg/m}^2$

The maternal and perinatal outcome of the subjects evaluated in relation to body mass index.

## Result:

A total of 150 women were included in the study fulfilling the inclusion criteria with BMI  $>30 \text{ kg/m}^2$ . They were further divided into 3 classes

- Class I: BMI  $30\text{-}34.9 \text{ kg/m}^2$  included 77 women
- Class II: BMI  $35\text{-}39.9 \text{ kg/m}^2$  included 58 women
- Class III: BMI  $>40 \text{ kg/m}^2$  included 15 women.

## Ante partum complications and its relation with BMI

Out of 150 women 82 women had preeclampsia, of which 27 women were between BMI  $30\text{-}34.9 \text{ kg/m}^2$ , 42 were between BMI  $35\text{-}39.9 \text{ kg/m}^2$ , 13 were with BMI  $>40 \text{ kg/m}^2$ . 14 women had gestational diabetes mellitus. 39 women were post term, of which 20 were between BMI  $30\text{-}34.9 \text{ kg/m}^2$ , 09 were between BMI  $35\text{-}39.9 \text{ kg/m}^2$ , 10 women with BMI  $>40 \text{ kg/m}^2$ . 8 women had IUGR. 5 women had preterm labor. Oligohydramnios were seen in 24 women, of which 11 were

between BMI 30-34.9 kg/m<sup>2</sup> and 13 were between 35-39.9 kg/m<sup>2</sup>. Polyhydramnios were seen in 6 women.

#### Mode of delivery

Of the total 150 women, 67 women delivered vaginally and 83 by LSCS. Of the 67 women delivered vaginally 21 were spontaneous, 36 were induced and 10 instrumental deliveries.

#### Indication for LSCS

Majority of the indications for LSCS is failed induction (n = 38), followed by fetal distress (n = 24).

#### Intra-partum and post-partum complications

Of the 150 women post-partum haemorrhage was encountered in 13 women (8.6%), of which 4 women delivered vaginally and 9 by caesarean. Six women had cervical tear. 8 women had wound gaping postoperatively and 2 women developed peripartum cardiomyopathy.

#### Perinatal complications

Out of 150 babies delivered 42 needed NICU admissions due to low APGAR scores. Macrosomia was seen in 28 babies.

**Table 1:** Antepartum complications in relation to BMI

Complication	Class I (n=77)	Class II (n=58)	Class III (n=15)	Total (n= 150)
GDM	05 (6.4%)	06 (10.3%)	03 (20%)	14 (9.3%)
Pre eclampsia	27 (35%)	42 (72.4%)	13(86.6%)	82 (54%)
Post term pregnancy	20	09	10	39
Oligohydramnios	11	13	-	24
Polyhydramnios	06	-	-	06
IUGR	05	03	-	08
Preterm labor	03	02	-	05

**Table 2:** Mode of delivery in relation to BMI

Delivery	Class I (n=77)	Class II (n=58)	Class III (n=15)	Total (n= 150)
1. Vaginal	37	21	09	67
a) Spontaneous	14	06	01	21
b) Induced	18	12	06	36
c) Instrumental	05	03	-2	10
2. LSCS	40 (51.9%)	37 (58.7%)	06	83

**Table 3:** Indication of LSCS in relation to BMI

Indication	Class I (n=40)	Class II (n=37)	Class III (n=06)	Total (n= 83)
Failed induction	15	18	05	38
Fetal distress	07	17	-	24
CPD	08	-	-	08
Deep transverse arrest	05	-	-	05
Secondary arrest in descent and dilatation	03	-	01	04
Severe preeclampsia	02	02	-	04

**Table 4:** Intrapartum and postpartum complications

Complication	Class I (n=77)	Class II (n=58)	Class III (n=15)	Total (n= 150)
PPH	07 (9%)	03 (4.7%)	03 (30%)	13 (8.6%)
Cervical/Vaginal tears	06 (7.7%)	-	-	06 (4%)
Wound gapping	-	06 (9.5%)	02 (20%)	08 (5.3%)

**Table 5:** Perinatal outcome in obese pregnant

Perinatal outcome	Class I (n=77)	Class II (n=58)	Class III (n=15)	Total (n= 150)
NICU	19	23	-	42
Weight > 3.5 kg	18	06	04	28
Weight < 3.5 kg	59	52	11	122

## Discussion

Obesity has been associated with greater risk of infertility, maternal morbidity, and complications of labor and delivery<sup>4,5,14</sup>. In early pregnancy there is an increased risk of spontaneous abortion and congenital anomalies<sup>5,15</sup>. In later gestation, gestational hypertensive disorders (preeclampsia, eclampsia) and diabetes are clinically recognized, which present metabolic like complication of pregnancy in obese women<sup>2,3,14,16</sup>

A number of systems have been used to define and classify obesity. The body mass index (BMI), also known as the Quetelet index, is currently most often used. The BMI is calculated as weight in kilograms divided by the square of the height in meters ( $\text{kg}/\text{m}^2$ )<sup>17</sup>

## Antenatal Complications

In this study we found that as the BMI increased the incidence of pre-eclampsia increased from 35% in those with BMI 30-35  $\text{kg}/\text{m}^2$  to 72.4% in those with BMI 35-39.9  $\text{kg}/\text{m}^2$  and 86.6% in those with BMI  $>40 \text{ kg}/\text{m}^2$ . The overall incidence of pre-eclampsia in obese women is 54% which is consistent with the study conducted by Dasagupta et al<sup>18</sup> where the incidence of hypertensive disorders is 38%. In a study conducted by Kabiru et al showed the incidence of hypertensive disorders in obese women as 35.4%<sup>10</sup>.

The increase in the risk of GDM increased with the increase in BMI from 6.4% in class I obese women to 10.3% in class II obese women. The overall incidence of GDM is 9.3%. In a study conducted by Yu C et al<sup>19</sup> the incidence of GDM was 2.3% in the control group and increased to 6.3% in the obese group (OR 2.6) and 9.5% in the morbidly obese group (OR 4.0).<sup>6</sup> Therefore, diabetes is associated with increasing overweight and obesity.

Post term pregnancy was seen in 25% women and the percentage women with post term pregnancy increased as BMI increased. Obese women are more likely to go for post term pregnancy and induction of labor.

Obese women are more prone for delivery by caesarean section. In our study the rate of caesarean increased with BMI. Lynch CM et al<sup>20</sup> studied over 5000 subjects in a retrospective cohort study, and showed that delivery by caesarean section was two- to three fold more likely in obese women. The same study also found that there was a progressive reduction in the successful vaginal delivery rate with increasing BMI, consistent with findings in our study<sup>21</sup>.

Post-partum haemorrhage and wound infections were significantly raised from obese women (9%) to morbidly obese women (30%). Alanis et al had demonstrated higher risks of post caesarean wound gap, discharge and seroma formation among the morbidly obese<sup>22</sup>.

## Conclusion

Obesity causes significant complications for the mother and foetus. Interventions directed towards weight loss and prevention of excessive weight gain must begin in the pre-conception period. Maternal and fetal surveillance may need to be heightened during pregnancy. Women need to be informed about both maternal and fetal complications and about the measures that are necessary to optimize outcome, but the most important measure is to address the issue of weight prior to pregnancy. Obesity represents an important modifiable risk factor for adverse pregnancy outcome.

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