Original Article

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

Authors

Dr Vinod*1, Dr Kalpana Mehta2, Dr Vimla Chaudhary3, Dr Sangeeta4, Dr Neetu Kamari5

1,4,5th year resident, 2Senior Professor & Unit Head, 3Assistant Professor Department of Obstetrics and Gynaecology, Umaid Hospital, Dr. S. N. Medical College, Jodhpur, Rajasthan

*Corresponding Author

Dr Vinod

Department of Obstetrics and Gynaecology, Umaid Hospital, Dr. S. N. Medical College, Jodhpur, Rajasthan

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 Gynaecology, 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/m², Class II: 35-39.9 kg/m², Class III: >40 kg/m². 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/m². Out of 150 women 82 women had preeclampsia, 14 women had gestational diabetes mellitus. 39 women were post term. 8 women had IUdR. 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 kg/m$^2$ or more as obese among adults. It was recognized as a risk factor in pregnancy more than 50 years ago, which increases the risks of maternal and perinatal complications.

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. 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. 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.

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. 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. 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 18.5-24.9 kg/m$^2$); overweight (BMI 25-29.9 kg/m$^2$) and; obese (BMI greater than 30 kg/m$^2$).

Subjects were categorized into 3 classes based on the BMI.
- Class I: 30-34.9 kg/m$^2$
- Class II: 35-39.9 kg/m$^2$
- Class III: >40 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 kg/m$^2$. They were further divided into 3 classes
- Class I: BMI 30-34.9 kg/m$^2$ included 77 women
- Class II: BMI 35-39.9 kg/m$^2$ included 58 women
- Class III: BMI >40 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 30-34.9 kg/m$^2$, 42 were between BMI 35-39.9 kg/m$^2$, 13 were with BMI >40 kg/m$^2$. 14 women had gestational diabetes mellitus. 39 women were post term, of which 20 were between BMI 30-34.9 kg/m$^2$, 09 were between BMI 35-39.9 kg/m$^2$, 10 women with BMI>40 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/m² and 13 were between 35-39.9 kg/m². 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

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

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

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

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

<table>
<thead>
<tr>
<th>Indication</th>
<th>Class I (n=40)</th>
<th>Class II (n=37)</th>
<th>Class III (n=6)</th>
<th>Total (n=83)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failed induction</td>
<td>15</td>
<td>18</td>
<td>05</td>
<td>38</td>
</tr>
<tr>
<td>Fetal distress</td>
<td>07</td>
<td>17</td>
<td>-</td>
<td>24</td>
</tr>
<tr>
<td>CPD</td>
<td>08</td>
<td>-</td>
<td>-</td>
<td>08</td>
</tr>
<tr>
<td>Deep transverse arrest</td>
<td>05</td>
<td>-</td>
<td>-</td>
<td>05</td>
</tr>
<tr>
<td>Secondary arrest in descent</td>
<td>03</td>
<td>-</td>
<td>01</td>
<td>04</td>
</tr>
<tr>
<td>Severe preeclampsia</td>
<td>02</td>
<td>02</td>
<td>-</td>
<td>04</td>
</tr>
</tbody>
</table>

**Table 4:** Intrapartum and postpartum complications

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

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

<table>
<thead>
<tr>
<th>Perinatal outcome</th>
<th>Class I (n=77)</th>
<th>Class II (n=58)</th>
<th>Class III (n=15)</th>
<th>Total (n=150)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NICU</td>
<td>19</td>
<td>23</td>
<td>-</td>
<td>42</td>
</tr>
<tr>
<td>Weight &gt; 3.5 kg</td>
<td>18</td>
<td>06</td>
<td>04</td>
<td>28</td>
</tr>
<tr>
<td>Weight &lt; 3.5 kg</td>
<td>59</td>
<td>52</td>
<td>11</td>
<td>122</td>
</tr>
</tbody>
</table>
Discussion
Obesity has been associated with greater risk of infertility, maternal morbidity, and complications of labor and delivery\textsuperscript{4,5,14}. In early pregnancy there is an increased risk of spontaneous abortion and congenital anomalies\textsuperscript{5,15}. In later gestation, gestational hypertensive disorders (preeclampsia, eclampsia) and diabetes are clinically recognized, which present metabolic like complication of pregnancy in obese women\textsuperscript{2,3,14,16}.

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 (kg/m$^2$)\textsuperscript{17}.

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 kg/m$^2$ to 72.4% in those with BMI 35-39.9 kg/m$^2$ and 86.6% in those with BMI >40 kg/m$^2$. The overall incidence of pre-eclampsia in obese women is 54% which is consistent with the study conducted by Dasagupta et al\textsuperscript{18} were 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%\textsuperscript{10}. 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\textsuperscript{19} 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).6 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\textsuperscript{20} 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\textsuperscript{21}.

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\textsuperscript{22}.

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.

References


