Original Article

TO COMPARE MATERNAL AND FETAL OUTCOME IN OBESE VERSES NON-OBESE LABORING MOTHERS

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ABSTRACT

Objective:
To compare maternal and fetal outcome in obese verses non-obese laboring mothers.

Study Design:
Case Control Comparative.

Place and duration:
January 2009 to October 2010.

Subjects and Methods:
We Selected 100 obese versus non-obese women who presented to us in labor and the data was collected regarding maternal and fetal complication noted during intrapartum and postpartum period till the patient was discharged from the hospital.

Result:
The age range of our patients was between 18-37 years with a mean age of 26.4 years. Twenty four percent presented postdate while 9% were post-term among obese patients. Twenty nine percent of obese needed induction while only 12% among non-obese needed induction. Thirty six percent of obese compared to 10% of non-obese needed C-Section. Shoulder dystocia occurred in 8% of obese while only 1% in non-obese. Postpartum hemorrhage occurred in 45% and 11% in obese and non-obese respectively. Macrosomia was encountered in 26% of obese versus 4% non-obese. Stillbirth was observed in 9% of the patient belonging to obese group.

Conclusion:
This study proves that maternal obesity is associated with adverse fetal and maternal outcomes in pregnancy including prolonged pregnancy, failed induction, operative deliveries, perineal tears, postpartum hemorrhage and postpartum infections. So these women should be considered and treated as high risk pregnancies.

Keywords: Obesity, macrosomia, caesarean section.

INTRODUCTION

Obesity is defined as body mass index in excess of 30 kg/m². This is a problem with grave implications, more so because of an ever-increasing incidence globally. In our country too it stands out to be a major health hazard with an incidence as high as 13.5%. WHO reports a prevalence of 17.1 % in the developing world. Obesity is implicated as a risk factor for both maternal and fetal complications. Its association with gestational diabetes and pre-eclampsia is established in obese pregnant ladies in about 14-25%. Induction of labor is warranted more in obese pregnant women than in non-obese together with a failure in progress of labor.

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There is twofold-increased likelihood of labor ending in Caesarean section in obese than otherwise.\(^8,9\)

Infection is also more common in Caesarean section incision in obese than non-obese.\(^10\)

There is also un-ambiguous evidence to suggest that postpartum hemorrhage is more common in obese than in non-obese women.\(^11\)

The hazard of obesity in pregnant women doesn’t end here as the list is ever increasing with more complications such as congenitally abnormal fetuses and greater perinatal mortality.\(^7,12,13\)

The ratio of macrosomic babies is greater than 26\% and 10.8\% in obese versus non-obese respectively.\(^14,15\)

There is also a more than threefold increased chance of shoulder dystocia.\(^14,15\)

The developed societies are laying great emphasis on accomplishing the etiological factor in relation to obesity, its incidence and the fetomaternal complications arising there from.

**METHODOLOGY**

This case control comparative study comprising of 100 obese as control versus 100 cases was conducted in women of reproductive age group 15-45 years, with BMI 2–29kg/m\(^2\) for obese and 19.8–29kg/m\(^2\) for non obese at term or above in labor were included while women with scarred uterus, placenta previa, HTN, cardiac disease, Diabetes, were excluded from the study. All patients who presented at Sultan Welfare Hospital Karachi fulfilling our study criteria whether obese or non-obese were included. Each patient was observed from the time of presentation till she was discharged. A Proforma was made and all relevant details with respect to labor and maternal or fetal complications were entered and data compiled. Statistical software SPSS version II was used for statistical data analysis. Categorical data was presented by frequency and percentage. Logistic regression analysis was performed to determine maternal and perinatal risk factors of obesity. Adjusted odd ratios with 95\% confidence interval were given. P-value <0.05 was considered a statistically significant result.

**RESULTS**

100 patients each from obese and non-obese group were included in the study. All the patients belonged to the middle or lower middle class. The age range was between 18-37 years. The mean age was being 26.4 ± 5.28 SO.

Between both groups, 40\% were primigravida while 60\% were multigravida. 24\% presented postdate in obese group and 14\% in non-obese group. Proportion of post term pregnancies was also similar in both groups (9\% vs 8\%). Among non-obese group need of induction was 12\% which was significantly less than the proportion of induction, 29\% in obese group (p<0.002). This reveals approximately 7 times higher risk of induced labor in obese than non-obese. (OR=7.39)

The rate of emergency caesarean section was significantly higher (approx. 6 times or >.3X) in obese group than non-obese group (36\% vs. 10\%, p<0.001). Among those obese that needed induction, the failure rate was 11\% thereby necessitating emergency caesarean section. Whereas no patient suffered either 3\textsuperscript{rd} or 4\textsuperscript{th} degree tear in non-obese while 6\% obese has 3\textsuperscript{rd} and 1 \% has 4th degree tear (Table 1).

As regards postpartum complications, primary postpartum hemorrhage was encountered in 1\% non-obese compared to 45\% obese respectively. Urinary tract infection was observed in 34\% and 5\% respectively in obese and non-obese. Uterine infection occurred in 8\% obese compared to only 0.1\% in non-obese. Similarly wound infection was observed in 15\% and 1 \% in obese and non-obese respectively (Table 1). The P-Value being 0.022 and or 6.62 (3.0–14.9). Stillbirth was observed in 9\% patients belonging to the obese group. Macrosomia defined as birth weight in excess of 4kg was encountered in only 4\% non-obese to as high as 26\% of obese. P-Value <0.001 and or 8.43, 30\% of neonates required intensive care support delivered by the obese group, whereas only 8\% of neonates born to the non-obese suffered the same outcome, the P value 0.001 and OR 4.93 (2.0–12.5). Shoulder dystocia occurred in 8\% obese and only 1 \% in non-obese group, P-value 0.04 OR 8.610.66–1.8) as detailed in Table 2.
Table 1. Maternal risk factors associated with obesity

<table>
<thead>
<tr>
<th>Variables</th>
<th>Obese (%) n = 100</th>
<th>Non-obese (%) n = 100</th>
<th>OR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parity status:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Primigravida</td>
<td>40</td>
<td>40</td>
<td>0.56 (0.23–1.36)</td>
<td>0.198</td>
</tr>
<tr>
<td>• Multigravida</td>
<td>60</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gestational age:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Term pregnancy</td>
<td>67</td>
<td>78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Post dates pregnancy</td>
<td>24</td>
<td>14</td>
<td>0.11 (0.02–0(0)</td>
<td>0.093</td>
</tr>
<tr>
<td>Post term pregnancy</td>
<td>9</td>
<td>8</td>
<td>0.08 (0.01–(50)</td>
<td>0.787</td>
</tr>
<tr>
<td>Onset of labor:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Spontaneous</td>
<td>71</td>
<td>88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Induced</td>
<td>29*</td>
<td>12</td>
<td>7.39 (2.60–21.06)</td>
<td>0.002</td>
</tr>
<tr>
<td>Mode of delivery:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• SVO</td>
<td>44</td>
<td>78</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>• Ventose VO</td>
<td>10</td>
<td>3</td>
<td>5.91 (1.39–28.76)</td>
<td>0.085</td>
</tr>
<tr>
<td>• Forceps VO</td>
<td>3</td>
<td>5</td>
<td>1.06 (0.19–5.45)</td>
<td>0.721</td>
</tr>
<tr>
<td>• Emergency LSCS</td>
<td>36*</td>
<td>10</td>
<td>6.38 (2.72–15.28)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>• Elective LSCS</td>
<td>7</td>
<td>4</td>
<td>3.10 (0.76–13.49)</td>
<td>0.535</td>
</tr>
<tr>
<td>PPH</td>
<td>45*</td>
<td>11</td>
<td>6.62 (3.0–14.9)</td>
<td>0.022</td>
</tr>
<tr>
<td>Uterine infection</td>
<td>34</td>
<td>5</td>
<td>9.79 (3.42–30.2)</td>
<td>&lt;0.00</td>
</tr>
<tr>
<td>Wound infection</td>
<td>15</td>
<td>1</td>
<td>17.47 (2.34–3(2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>3rd degree tear</td>
<td>6</td>
<td>a</td>
<td>---</td>
<td>0.823</td>
</tr>
<tr>
<td>4th degree tea</td>
<td>1</td>
<td>a</td>
<td>---</td>
<td>0.988</td>
</tr>
</tbody>
</table>

*Significantly high proportion at 5% level of significance.

Table 2. Perinatal risk factors associated with obesity

<table>
<thead>
<tr>
<th>Variables</th>
<th>Obese (%) n = 100</th>
<th>Non-obese (%) n= 100</th>
<th>OR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perinatal outcome</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Alive</td>
<td>92</td>
<td>95</td>
<td>2.81 (0.65–13.84)</td>
<td>0.007</td>
</tr>
<tr>
<td>• Still birth</td>
<td>9*</td>
<td>3</td>
<td>0 (0–4.08)</td>
<td></td>
</tr>
<tr>
<td>• Early NND</td>
<td>0</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoulder dystocia</td>
<td>8*</td>
<td>1</td>
<td>8.61 (1.06 - 187)</td>
<td>0.041</td>
</tr>
<tr>
<td>NICU requirement</td>
<td>30*</td>
<td>8</td>
<td>4.93 (2.0 - 12.5)</td>
<td>0.001</td>
</tr>
<tr>
<td>Macrosomic baby</td>
<td>26*</td>
<td>4</td>
<td>8.43 (2.64 - 29.9)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

*Significantly high proportion at 5% level of significance.
DISCUSSION

Obesity is being increasingly recognized to be a universal problem of epidemic proportions. This is substantiated by a number of studies worldwide suggesting that there is an increased risk and susceptibility related to both maternal and fetal complications in the obese group. This study was carried out to substantiate or negate the above hypothesis i.e. obesity is associated with adverse outcome both for mother and fetus.

The age range in our study was 18-37 with a mean of 26.4 years this correlates to other studies.16 60% patients in obese group were multigravida, Getahun D also observed that obesity was prevalent in the multipara, similarly the obese group also exhibited post-date as well as post-term deliveries.17,18 24% were post-date whereas 9% were post-term among the obese group in our study correlating well with the findings by Dension FC.19 In our study, induction of labor was required in 29% obese compared to the findings by Stephan et al i.e. 7% and 42.8% by Bhattacharya S in the obese.15,20 Both elective as well as emergency C-section were needed more in obese than in non-obese in our study. This is also supported by a recent study showing definite association between obesity and risk of C-Section.2,21 This increased risk may be due to weaker uterine contractions in obesity. Similarly risk of instrumental delivery is also found to be higher in our as well as other studies.

There is a consistent susceptibility to PPH in obese individuals in various studies.21 In our study it is 45%, this incidence is higher in when both spontaneous vaginal as well as C-Section delivery was done. This correlates very well with other studies.20 This may be due to ineffectual uterine contraction together with the fact that placental implantation covering a very large area with a higher gestational age.

Kabiru Wet al observed 27.3% incidence of 3rd to 4th degree tears in obese cases, same correlates with our study.22 Our study also observed an increased evidence of Infective outcome 8% in the obese group affected by uterine infections, this correlates with the findings in other studies.20 Urinary tract infection was found in our study to be as high as 34% in the obese; Schneif observed the same outcome.23 Macrosomia in our study was encountered in 26%, P-Value < .001 compared to 17.4% and 16.9% incidence found by other researches.17 Intensive care support was needed in more babies with macrosomia than otherwise i.e. 30% in obese group. In obese patients 8% had early neonatal death this compares well with other study.24 In our study there is an increased incidence of shoulder dystocia in obese group which correlates well with other studies.14,15 There was 8% stillbirth among obese patients in our study, similar findings were observed by Kristensen J.25 He reports that this rate is twice in obese patients. Hyperlipedemia is considered to be causative factor as it reduces prostacyclin production. Other factor may be placental insufficiency as well as increased insulin levels in the obese pregnant women.25 Our study indicates definitely higher adverse outcomes both maternal as well as fetal in obese patients with a pre-pregnancy BMI on the higher side. As maternal obesity is associated with so many risk and also because of the fact that it is associated with so many morbidities it is absolutely imperative on the part of the medical practitioners as well as the health authorities to emphasis and counsel women to achieve an optimum and avoid gaining excessive weight before during and after pregnancy for healthier life.

CONCLUSION

Obesity has undividable implications albeit unviable on pregnancy and its complication arising there from. It is an alarmingly increasing problem in Pakistan just as it is in other countries. There is an unequivocal increased incidence of poor labor outcome unfortunately both maternal and fetal. This study advocates recommending an awareness effort, to make women understand the hazardous effects of obesity and its implication on pregnancy. They should have optimal BMI and that they need to be carefully and closely monitored as they if obese carry high risk and are invulnerable group. The general practitioners, media, LHV’s, midwives should all be proactive in this crusade against obesity and make concerted effects to reduce the morbidity and mortality related to pregnancy associated with obesity, the nation will be healthier and economically more vibrant if this problem is addressed too.
REFERENCES