

A clinical study of maternal and neonatal outcome in pregnant women with obesity (BMI more than 30) at a tertiary hospital

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ABSTRACT

Background: Obesity is one such pre-existing maternal morbidity that puts a pregnancy at risk. Maternal obesity is a frequent high-risk factor with substantial prenatal, intranasally, and postnatal problems. This study aimed to analyze maternal and fetal outcome in obese pregnant women (BMI more than 30) at our tertiary care teaching hospital.

Material and Methods: This study was prospective & observational study, conducted in pregnant women, gestational age > 28 weeks, with BMI > 30, delivering at our labour room. Maternal and neonatal outcomes were analysed.

Results: Among 453 pregnant women with BMI ≥ 30 kg/m², majority were from 19—25 years age group (45.1 %), 48.03% were primigravida, 82.33% had > 37 weeks of gestation. In the study group 78.43% were moderately obese, 15.69% were severely obese and only 5.88% were morbidly obese. Most common pre pregnancy medical disorder in obese women were preeclampsia (21.57 %), previous LSCS (20.59 %), severe anaemia (19.54 %), gestational diabetes mellitus (12.75 %), gestational hypertension (9.80 %) & multiple pregnancy (1.96 %). Common intrapartum events were Preterm labor (16.67 %), PPH (6.78 %), Abruptio placenta (4.90 %), Mal presentation Breech (4.90%) & Eclampsia(1.96%). 63.71% of obese pregnant women delivered by normal vaginal delivery, 31.37% of obese pregnant women underwent caesarian section & 4.90% of obese women were requiring instrumental delivery. Common indication for NICU admission were infant of diabetic mother (22.55 %), preterm (14.71 %), meconium aspiration (5.88 %), macrosomia (3.92 %), asphyxia (1.96 %) & transient tachypnea of new born (1.96%). No maternal or neonatal mortality observed in present study.

Conclusion: In obese pregnant women with BMI >30 kg/m², higher incidence of gestational hypertension, preeclampsia, gestational diabetes mellitus, anaemia, malpresentation, cephalopelvic disproportions and hypothyroidism is noted,

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

INTRODUCTION

century. According to the World Health Organization (WHO), According to the WHO World Health Statistics survey report 2012, One in every six persons worldwide is obese, and approximately 2.8 million people die each year as a result of a high BMI and associated complications.¹ From 1976 until 2016, the proportion of adult women (aged ≥ 20 years) with obesity increased from 6% to 15% globally.²

Pregnancy is seen as a physically normal stage of a woman's life. However, the mother's pre-existing morbidity, as well as those that arise during pregnancy and postpartum, might make the pregnancy a high-risk one. When the chance of an undesirable result for the mother or child is enhanced beyond the base line risk of that event in the general population due to the presence of one or more ascertainable risk factors³, pregnancy is considered high risk.^{4,5}

Obesity is one such pre-existing maternal morbidity that puts a pregnancy at risk. Ours is a tertiary care hospital catering around 20,000 deliveries per annum with many high risk pregnant women, Maternal obesity is a frequent high-risk factor with substantial prenatal, intranasally, and postnatal problems. This study aimed to analyze maternal and fetal outcome in obese pregnant women (BMI more than 30) at our tertiary care teaching Hospital.

MATERIAL AND METHODS

This study was prospective & observational study, conducted in department of obstetrics & gynaecology, at government medical college & hospital, Aurangabad, Maharashtra, India. Study period was of 2 years (from September 2019 to August 2021). The study was approved by institutional ethics committee

Inclusion Criteria:

- Pregnant women, gestational age more than 28 weeks, with BMI more than 30, delivering at our labour room, Willing to participate in present study

Exclusion Criteria:

- Anomalous baby
- IUFD
- Pregnant women with BMI less than 30kg/m²
- Women not giving consent

This study was approved by Institution Ethics Committee, After taking written informed consent, Detailed history and examination was done. Data was documented in case performan and data collection sheets were prepared. Pregnant women were selected according to the criteria. Detailed, history and History of previous pregnancy outcome was obtained. Family history of obesity, hypertension and diabetes, were enquired.

Complete general and physical & obstetric examination was done. They were followed, up to delivery and postpartum until discharge and outcome studied. The maternal BMI was determined at the time of admission to the labor room. On admission NST was done, ultrasonography evaluation & Relevant haematological investigations were done. As per the maternal and fetal risk, decision for induction of labor or spontaneous progress of labor was decided. During the labor, patient was monitored with computerized cardio position were used topography and partograph. Standard obstetric care such as ambulation, diet, various birthing during the labor. 2nd stage of labor was monitored carefully and decision of instrumental delivery was taken accordingly. Decision for Caesarean section was taken, whenever indicated. Neonatologist was present during each delivery and baby was examined and managed by neonatologist soon after delivery. Active management of third stage of labor was provided to each patient. Standard Postnatal care was given , proper method of breast feeding was advised.

All the high risk obese mothers who had delivered vaginally and who underwent instrumental delivery were monitored for 5 days and discharged on 5th day. All the obese mothers who underwent Caesarian section were monitored and discharged on day 7 if the wound site was healthy .

Data was collected and compiled using Microsoft Excel, Statistical analysis was done using descriptive statistics.

RESULTS

453 pregnant women with BMI $\geq 30\text{kg/m}^2$ were selected and were followed prospectively. 19—25years age group was most common (45.1%). Mean age of the obese pregnant women presented to our labor room was found to be 26.54 ± 4.73 years. In the study group 78.43% were moderately obese, 15.69% were severely obese and only 5.88% were morbidly obese. Among obese women 48.03% were primigravida, 82.33% had > 37 weeks of gestation

Table no. 1 – General Characteristics

| Characteristics | No. Of patients | Percentage |
|-------------------------|-----------------|------------|
| Age (in years) | | |
| 19—25 | 202 | 45.10% |
| 26—30 | 123 | 27.45% |
| 31—35 | 92 | 20.59% |
| >35 | 31 | 6.86% |
| Gravida status | | |
| Primi | 215 | 48.03% |
| Gravida 2 | 74 | 16.66% |
| Gravida 3 | 105 | 23.52% |
| Gravida 4 and more | 53 | 11.79% |
| BMI kg/m^2 | | |
| 30-34.9 | 351 | 78.43% |
| 35-39.9 | 70 | 15.69% |
| ≥ 40 | 26 | 5.88% |
| Gestational Age (Weeks) | | |
| 32-34 | 26 | 3.28% |
| 35-37 | 75 | 14.47% |
| >37 | 372 | 82.33% |

Most common pre pregnancy medical disorder in obese women were found to be preeclampsia (21.57 %), previous LSCS (20.59 %), severe anaemia (19.54 %), gestational diabetes mellitus(12.75%), gestational hypertension(9.80%),multiple pregnancy(1.96%), placenta previa (1.96 %), oligohydramnios (1.96 %) & history of DVT (0.98 %).

Table no 2 – antenatal Variables

| High risk factor | No of patients | Percentage |
|-------------------------------|----------------|------------|
| Severe Anaemia | 87 | 19.54% |
| Preeclampsia | 96 | 21.57% |
| Previous LSCS | 92 | 20.59% |
| Gestational Diabetes Mellitus | 57 | 12.75% |
| Gestational Hypertension | 44 | 9.80% |
| Rh negative | 13 | 2.94% |
| Multiple pregnancy | 9 | 1.96% |
| Placenta previa | 9 | 1.96% |
| History of DVT | 4 | 0.98% |
| Oligohydramnios | 9 | 1.96% |

In present study, common in trapartum events were Preterm labor(16.67%),PPH(6.78 %), Abruptio placenta (4.90 %), Mal presentation Breech (4.90 %) & Eclampsia (1.96%).

Table no 3 Intrapartum variables

| | No of patients | Percentage |
|------------------------|----------------|------------|
| Preterm labor | 75 | 16.67% |
| PPH | 28 | 6.78% |
| Abruptio placenta | 22 | 4.90% |
| Malpresentation Breech | 22 | 4.90% |
| Eclampsia | 9 | 1.96% |
| Malpresentation Face | 4 | 0.98% |

63.71% of obese pregnant women delivered by normal vaginal delivery, 31.37% of obese pregnant women underwent cesaerian section & 4.90% of obese women were requiring instrumental delivery. Cephalo Pelvic Disproportion was the most common indication for LSCS, followed by maternal reques, failed induction, fetal distress.

Table no 4 mode of delivery

| Mode of delivery | | No of patients | % | Total | % |
|-----------------------|---------|----------------|--------|-------|-------|
| Vaginal delivery | FTND | 210 | 47.06% | 285 | 63.71 |
| | PTVgD | 75 | 16.67% | | |
| LSCS | FTLSCS | 114 | 25.49% | 140 | 31.37 |
| | PTLSCS | 26 | 5.88% | | |
| Instrumental delivery | Forceps | 9 | 1.96% | 22 | 4.90 |
| | Vaccum | 13 | 2.94% | | |

35.14% of the babies had birth weight between 3-3.49 kgs , 2.8.67% of the babies had birth weight between 2.5-2.99kgs,95.10% of babies had Apgar >7 & 4.90% of babies had Apgar ≤7.

Table no 5 Neonatal variables

| Indication | No of patients | Percentage |
|---------------------------------|----------------|------------|
| Infant of Diabetic Mother | 101 | 22.55% |
| Preterm | 66 | 14.71% |
| Meconium Aspiration | 26 | 5.88% |
| Macrosomia | 18 | 3.92% |
| Asphyxia | 9 | 1.96% |
| Transient Tachypnia of New born | 9 | 1.96% |
| IUGR | 4 | 0.98% |

DISCUSSION

Obesity in pregnancy has grown at the same rate as obesity in the general population. In research done by Mohan et al.,⁶ the prevalence was 22.5 percent in men and 31.8 percent in females in the age category of more than 20 years. This study supports the observation done in our study, most of the obese (48%) pregnant women are of early reproductive age group of 19-25 yrs.

The two most prevalent medical consequences of obese gravida are essential hypertension and diabetes mellitus, which have a substantial connection with obesity in the general population.

Obesity in the mother is linked to an increased risk of gestational diabetes. Our study showed that the rate of occurrence of diabetes in pregnancy was 12.1%. This elevated risk is mostly due to an excessive rise in insulin resistance in obese individuals. Grosset al.,⁷ and Ehrenberget al.,⁸ who found a 6.5 percent and 8.0 percent incidence of gestational diabetes, respectively.

Pre-eclampsia complicated 21.57% of pregnancies and it is associated with many complications like intrauterine growth restriction, placental abruption, preterm delivery, labor induction and perinatal morbidity.

Early-onset illness is caused by aberrant placentation, the leading cause of maternal and neonatal morbidity and mortality, while late-onset pre-eclampsia is caused by maternal metabolic disorder. Preterm pre-eclampsia is more common in moms with a high BMI than in mothers with a normal BMI.

Sibare NJ et al.,⁹ found a significant difference in the incidence of pre-eclampsia between women with a BMI of less than 20 kg/m² (4.3%) and those with a BMI of more than 34 kg/m² (12.6%) in the early second trimester (P 0.0001). The process through which obesity causes greater resistance, as well as subclinical inflammation and endothelial dysfunction, is also to blame for the higher prevalence of pre-eclampsia in obese women.

Most common indication for NICU admission were . infant of diabetic mother (22.55 %), preterm (14.71 %), meconium aspiration (5.88 %), macrosomia (3.92 %), asphyxia (1.96 %) & transient tachypnia of new born (1.96%). No maternal or neonatal mortality observed in present study.

In our study we noted that 19.54% obese were found to be anaemic. This was comparable with Elmar et al.,⁵ study who proved that obesity is a potential risk factor for nutritional deficiency anaemia.

In our study we noted that, the rate of preterm labour i.e. gestational age <37 weeks was

slightly higher with incidence being 16.67%. This is in comparison to Dasgupta et al.,¹⁰ who showed that incidence preterm labor with gestational age <34 weeks is 15.79% which is more common in the obese mothers compared to the non-obese mothers.

In our study, incidence of PPH was 6.78%. Dasgupta et al.,¹⁰ study showed that incidence of PPH was 31.6% among obese pregnant women and it significantly increased with increasing BMI.

Sebire et al.,⁹ study came with the inference that the risk of postpartum haemorrhage rises with increasing BMI, and it was 30% more frequent in moderately raised BMI and about 70% more frequent for women with morbidly obese BMI compared with women of normal BMI.

In our study we observed that, about 38.24% of obese women required induction of labour, main indication for labour induction was Pre-eclampsia (10.68%). While the failure of induction was also higher in the obese women, with 15.63% in BMI >30 kg/m² category. This was comparable to Wolf KB et al.,¹¹ found that the rate of induction increases with increasing BMI which was 28% in the normal BMI and 34% in the obese category women.

Arrow smith et al.,¹³ tested IOL with pregnant women with varying BMIs and found that delivery after induction by BMI group showed a reduction in vaginal delivery following induction as BMI increased. It also revealed that obese women were more likely than normal-weight women to have an induction that resulted in a caesarean section.

The frequency of induced labour increased with increasing BMI, according to Bhattacharya et al.⁴ Obese women had a considerably greater rate of induction of labour (30.9 and 26.9% vs. 6.8%) than overweight women and pregnant women with a normal BMI, according to Meenakshi et al.¹³

Our study noted that 285 patients delivered vaginally among which 75 patients i.e. 16.67% of them delivered preterm vaginal delivery. Totally 63.73% of the obese BMI group delivered vaginally. These results were found to be similar to Dinatale et al.,¹⁴ study on obesity and fetal/maternal outcome. They found that the successful normal vaginal deliveries decrease as the body weight & BMI of the mother increases & a significant increase in delivery by cesarean section in the obese parturient mother is noted.

In our study, it is noted that 140 women among 447 women underwent cesarean section. With the incidence of 31.37% in total, among which 92 women had undergone emergency cesarean section in comparison to 48 women who had elective cesarean section as a result of our research, we discovered that the rate of emergency cesarean sections is double that of elective cesarean sections.

Bhattacharya et al.,⁴ noted that emergency cesarean section rate was 58.8% in the obese women. Our findings were compared to those of Meher-un-nisa et al.,² who found that obese women have considerably greater rates of caesarean section than those of normal weight (15-25 percent versus 4.8 percent). According to Sebire et al.,⁹ the caesarean section rate for obese women was above 20%, compared to less than 10% for normal-weight women. In this series, the frequency of both elective (8.48%) and emergency (13.40%) Caesarean sections increased with rising BMI.

Results of our study showed that more than 26% of the babies born with birth weight more than 3.5 kg. Macrosomia (birth weight >400g) was more prevalent in the obese (13.7 percent) and severely obese (15.9%) categories, according to the Bhattacharya² et al study.

In the study by Meher-un-nisa et al.,¹ they found that the frequency of macrosomia remained considerably higher in obese (07%) and severely obese (12%) female newborns compared to normal weight female infants (0.96 %).

From our study it was evident that neonatal complications was more common in the obese mothers. Most common cause for admission to NICU was Infant born to diabetic mother, as ours was tertiary care centre with good NICU availability, it was a protocol in our hospital to admit the baby born to Diabetics mother for observation for minimum of 48hours.

CONCLUSION

Our study points out the numerous maternal and perinatal risks in obese pregnant women with BMI >30kg/m², which pose a considerable challenge to the obstetrician. In obese pregnant women higher incidence of gestational hypertension, preeclampsia, gestational diabetes mellitus, anaemia, malpresentation, cephalopelvic disproportions and hypothyroidism were noted. Labor related complications like increased incidence of induction of labor, increased incidence LSCS, increased neonatal admissions to NICU are noted.

Conflict of Interest: None to declare

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