Original Research Article

Prospective study on effect of obesity on maternal and fetal outcomes in obese pregnant women

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Abstract

Objectives: To analyse adverse maternal and fetal outcomes in obese pregnant women. **Materials and Methods:** This study was conducted in department of OBG, Government general hospital, Anantapur. 211 pre pregnant obese women and 211 non obese pregnant women were enrolled as study population and controls respectively. **Results:** Obese pregnant women were at increased risk of gestational diabetes mellitus, pregnancy induced hypertension, preeclampsia, preterm labour, cesarean section, instrumental deliveries, postpartum infection morbidities when compared to non–pregnant women. Large for gestational age, macrosomia, birth injuries, shoulder dystocia, premature deliveries, late fetal deaths and congenital malformations were more common in new borns of obese pregnant women than in non–pregnant obese women. **Conclusion:** Obesity is a modifiable risk factor. Preconception counseling and creating awareness regarding health risks associated with overweight and obesity should be encouraged.

Key Words: Obesity, modifiable Risk factor in pregnancy

Introduction

Obesity is a major public health problem across the world. The proportion of children and adult who are obese or overweight has increased rapidly in last three decades. The World Health Organization (WHO) has described the phenomenon as a "global epidemic," with the number of overweight and obese people nearly tripled between 1975 and 2016[1]. The risk of pregnancy-associated disorders increases with increasing severity of obesity. The risk of pregnancy-associated disorders increases with increasing severity of obesity[2-6]. A 10% difference in pre-pregnancy BMI is associated with an at least 10% change in relative risk of preeclampsia and gestational diabetes, respectively[8].

The WHO recognizes obesity as a pandemic issue, with prevalence more in females than in males. Pregnancy with obesity is a high risk pregnancy. It causes adverse maternal and fetal outcomes. Permission from hospital ethical committee was taken.

Materials & Methods

This study was conducted for a period of 1 year from November 1, 2020 to October 31, 2021 in Department of Obstetrics and Gynecology, Government medical college, Anantapur.

211 pre-pregnant obese women and 211 non obese pregnant were enrolled in the study group and in the control group respectively.

Inclusion Criteria

- Study group was pregnant mothers with BMI of 32 ± 2.2kg/m2 and singleton pregnancies.
- Controls were selected with BMI of 20.9 ± 2.4 kg/m2.
- All women were enrolled in to study groups and controls based on their BMI in pre-pregnant state and at the first antenatal **checkup**.

Exclusion Criteria

Obese pregnant women presenting with medical disorders and multiple pregnancies were excluded from the study.

Obese pregnant women presenting with medical disorders and multiple pregnancies were excluded from the study. All pregnant women were followed up with regular antenatal checkups, USG and other special investigations to detect adverse maternal and fetal outcomes. They were admitted in our antenatal ward in due time for timely management and intervention.

High risk pregnant mothers were monitored with biweekly cardiotocography, DFMC and daily fetal heart rate monitoring.

Complications if any, were treated as per protocol. Mode of delivery was decided based on obstetric indication.

On sixth week follow-up all patients were again scrutinized for the outcomes and complications.

Fisher's exact test was employed to compare categorical variables between obese and control subjects.

The strength of association had been expressed as the odd ratio of obese versus control along with 95% confidential interval values. A p value < 0.05 was considered statistically significant.

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Results

Table 1: Patient Distribution & Previous Obstetrical data of Obese Pregnant Women

Age in Years	Number of cases N = 211	Parity	Number of cases N = 211	Age in Years
18 – 24	41	Primigravidae	163	18 – 24
24 – 32	150	Multigravidae	48	24 – 32
33 – 38	20	–	–	33 – 38

Table 2: Route Deliveries in Obese &Control Groups

Route of delivery	Obese	Controls	OR(CI-95%)	p value
EM LSCS	78(36.2%	37 (17.5%)	2.65 (1.9-3.6)	<0.001
EL LSCS	48(22.0%	33 (15.6%)	1.59 (1.1-2.4)	0.011
Vaginal	58(27.4%	130 (61.3%)	0.24 (0.17-0.)	<0.001
Instrumental	27(12.3%	11 (5.2%)	2.56 (1.5-4.20)	<0.001

Table 3: Indication for Cesarean Section in Obese & Controls

Cesarean section	Obese 124	Control 70
previous uterine scar	30(12.1%	23(16.4%)
Fetal distress	64(25.8%	52(37.1%)
Breech	9(3.62%	6(4.%)
Labor induction failure	60(24.2%	30(21.4%)
PIH	7(2.82%	2(1.4%)
Preeclampsia	37(14.2%	14(10%)
Arrest of cervical dilation	22(8.8%	11(7.8%)
Macrosomia	9(7.6%)	1(1.4%)

Table 4: Indication for Induction of Labour in Obese & Controls

Labour induction	Obese Women	Control
Rupture of membranes	22 (16.16%)	16 (21.33%)
Diabetes mellitus	40 (26.69%)	5 (6.66%)
Hypertension	21 (15.78%)	4 (5.33%)
Postdated pregnancy	17 (12.78%)	10 (13.33%)
Programmed delivery	34 (25.56%)	40 (32.0%)

Table 5: Fetal Complications

Fetal outcome	Obese (N = 207)	Controls (N = 211)	OR(CI-95%)	p value
Birth weight < 2.5 kg	16 (7.7%)	42 (9.9%)	0.76 (0.4 – 1.2)	0.0274
Birth weight > 3.5 kg	46 (22.2%)	12 (2.8%)	9.74 (5.2 – 18.1)	< 0.001
Preterm babies <34 weeks	16 (7.7%)	15 (3.5%)	2.23 (1.1 – 4.1)	0.016
Preterm babies <37 weeks	11 (5.3%)	24 (5.7%)	0.91 (0.5 – 1.6)	0.880
Small for gestational age	18 (8.7%)	64 (15.2%)	0.53 (0.3 – 0.8)	0.004
Large for gestational age	96 (46.3%)	82 (19.4%)	3.58 (2.6 – 4.8)	<0.001
Infant birth trauma	5 (2.4%)	0	2.18 (1.2 – 3.44)	<0.001
Recoveries in NICU	43 (20.7%)	82 (19.4%)	1.08 (0.7 – 1.5)	0.667
Congenital anomaly	3 (1.2%)	1 (0.2%)	5.13 (0.5 – 4.42)	0.012
Neonatal mortality	1 (0.5%)	0	5.11 (0.2 – 1.06)	0.246

Table 6: Maternal Outcome in Obese & Control Groups

Maternal outcome	Obese	Controls	OR (CI-95%)	p value
Gestational diabetes mellitus	41 (19.43%)	8 (3.79%)	6.12 (3.5 – 10.6)	<0.001
PIH	26 (12.32%)	5 (2.36%)	5.76 (2.9 – 11.5)	<0.001
Preeclampsia	18 (8.76%)	5 (3.31%)	2.80 (1.5 – 5.26)	0.001
Preterm labour <37 weeks	11 (5.21%)	12 (5.68%)	0.91 (0.5 – 1.6)	0.880
Preterm labour <34 weeks	16 (7.58%)	8 (3.55%)	2.23 (1.1 – 4.2)	0.016
UTI	31 (14.69%)	10 (4.97%)	3.29 (1.9 – 5.5)	<0.001
Thromboembolic phenomenon	3 (1.18%)	0	11.13 (0.6 – 202.9)	0.062
Chronic hypertension	11 (5.21%)	1 (0.47%)	11.55 (2.7 – 49.4)	<0.001
Overt diabetes mellitus	5 (2.36%)	0	21.51 (1.3 – 368.5)	0.002
IUFD	3 (1.42%)	1 (0.23%)	6.22 (0.7 – 51.9)	0.066
Maternal mortality	0	0	0	0

Table 7: Intrapartum & Postpartum Complications

Complications	Obese (N = 211)	Controls (N = 211)	OR(CI-95%)	p value
Meconium stained liquor	83 (20.37%)	26 (12.32%)	1.82 (1.2 – 2.6)	0.002
Non progress of labour	31 (14.69%)	12 (5.43%)	3.13 (1.8 – 5.2)	<0.001
Shoulder dystocia	6 (2.6%)	1 (0.47%)	5.62 (1..2 – 25.5)	0.022
Perianal and cervical tear	20 (9.47%)	5 (2.36%)	4.31 (2.1 – 8.7)	<0.001

Postpartum Complications				
Endometritis and wound infection	21 (9.95%)	8 (3.79%)	2.8 (1.5 – 5.0)	<0.001
PPH	12 (5.45%)	9 (4.02%)	1.39 (0.7 – 2.7)	0.407
Puerperal pyrexia	16 (7.58%)	5 (2.36%)	3.38 (1.6 – 6.9)	<0.001
Total hospital stay >7 days	26 (12.55%)	12 (5.68%)	2.56 (1.5 – 4.3)	<0.001

Discussion

Purpose of this study is to highlight the impact of maternal obesity on pregnancy. Majority of the obese pregnant women in our study were aged between 25 and 32 years and among them 163 (77.25%) were primigravida. Obese pregnant women required more often cesarean sections and instrumental deliveries as mode of termination. Rate of labor induction was also higher in obese pregnant women. Increased incidences of morbidities like; GDM, PIH, preeclampsia, urinary tract infection and thromboembolism. They were also prone to develop overt diabetes and chronic hypertension in future.

Studies have shown that obese women have a greater decrease in insulin sensitivity during pregnancy than normal-weight women and subsequently are at an increased risk of not only GDM but also associated morbidities, including preeclampsia, gestational hypertension, macrosomia, and cesarean deliveries[9].

Most of the newborns born to obese pregnant women were large for gestational age and had birth weight more than 3.5 kg.

The preterm birth rate—both spontaneous and medically indicated due to pregnancy-associated conditions—is increased in obesity and contributes to the unfavorable neonatal outcome[10,11].

As a result obese group had high incidence of shoulder dystocia, birth canal trauma and infant birth trauma at the time of delivery than average weight women.

Macrosomia, or large for gestational age (LGA), is another neonatal complication associated with obesity in pregnancy and increases the risk for operative delivery, poor delivery outcomes, and maternal and infant traumatic injuries[12].

Satpathy H K et al[13], Andearsen KR et al have stated that major maternal complications associated with obesity during pregnancy include GDM, hypertensive disorder, infections, thromboembolic phenomena, labor difficulties and increased operative interferences.

They had observed higher rate of miscarriage, late fetal death, macrosomia, preterms, large for gestational age babies and neonates with congenital anomalies in the obese group.

The results of these studies were in concordance with our observation.

H Roman et al[14], had studied 2081 obese women and found raised incidences of preeclampsia, PIH, chronic and gestational diabetes mellitus and obese women were more likely to be delivered by cesarean section. They had also stated that the rate of in utero fetal death, neonatal and perinatal death was significantly higher in the obese women group and they proved the increased BMI to be an independent predictive factor for preeclampsia.Barclay L et al[15], after analyzing a total of 10,249 cases and 4065 controls, conclude that maternal pre–pregnancy obesity is associated with increased risks for spina bifida, heart defects, anorectal atresia, hypospadias, limb reduction defects, diaphragmatic hernias and omphalocele in infants.

Conclusion

Obesity became an independent risk factor for adverse maternal and fetal outcomes. As it is modifiable and preventable risk factor, preconception counseling, treatment of obesity before conception and creating awareness regarding risks associated with it are highly desirable.

Conflict of Interest: Nil Source of support: Nil

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