

Obstetrical Outcome in Obese Patients

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ABSTRACT

Introduction: Obesity has become a global health problem and every year its prevalence is on the rise. The rise in obesity prevalence has been most prominent in women of reproductive age (postadolescent and premenopausal) with women tending to gain 0.5–1 kg each year from early adulthood until middle age. This has significant impacts on reproductive health in women as they enter pregnancy at a higher body mass index (BMI). The purpose of this study is to evaluate obstetric complications and perinatal outcomes in pregnant women with obesity (BMI \geq 30.0 kg/m²).

Materials and methods: In this prospective study, antenatal women with increased BMI ($>$ 30 kg/m²) were followed up in the outpatient department (OPD) of the Department of Obstetrics and Gynaecology from December 2020 to December 2021 at a tertiary care hospital in Amritsar, Punjab, India, and maternal complications and neonatal outcome were studied in them. Women were counseled on the optimization of body weight before planning further pregnancy.

Results: The data revealed that 42.5% of the study participants developed gestational diabetes mellitus (GDM), 23.75% of the participants developed both GDM and hypertensive disorder of pregnancy (HDP), 17.5% developed only HDP, 12.5% developed fetal growth restriction (FGR), 3.75% of study participants lost to follow-up.

Conclusion: Obesity is a clear contributor to a wide range of maternal and fetal complications. The risks associated with obesity in pregnancy cannot necessarily be influenced by the intervention. Preventive measures aiming at normalizing body weight before conception are thus the most important and rewarding.

Keywords: Body mass index, Fetal growth restriction, Gestational diabetes mellitus, Hypertensive disorder of pregnancy, Obesity.

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INTRODUCTION

Obesity is increasing in prevalence and has become a global health problem. It is multifactorial in origin, and the causative factors are lack of physical exercise, changes in diet composition, and increased caloric intake. World Health Organization (WHO) characterizes obesity as a pandemic issue, with a higher prevalence in females than males. Thus, many pregnant patients are seen with high BMI.

The WHO defines obesity as a BMI above 30 kg/m². Obesity is subdivided into three classes (Table 1).¹

In 2009–2010, more than one-third of the adults in the USA were obese (BMI $>$ 30 kg/m²).² In a report looking at these groups in the United States between 2000 and 2005, the prevalence of self-reported BMI over 50 kg/m² increased by 75%.³ In 2014, the estimated percentage of overweight and obesity among pregnant women was 21.7% in India and 33% in the USA.⁴ In 2013, the American Medical Association classified obesity as a disease. The prevalence of obesity among women of reproductive age is increasing worldwide, with current estimates of 20–36%.⁵ The heaviest BMI groups have been increasing at the fastest rates for 20 years; consequently, the obstetrician will be caring for more superobese women.⁶

According to Royal College of Obstetricians and Gynaecology guidelines 2018,⁷ compared with women of a healthy prepregnancy BMI, pregnant women with obesity are at increased risk of miscarriage, gestational diabetes, pre-eclampsia, venous thromboembolism (VTE), induced labor, dysfunctional or prolonged labor, cesarean section, anesthetic complications, postpartum hemorrhage (PPH), wound infections, and mortality. Women over their ideal weight are less likely to initiate and maintain breastfeeding than women of normal weight.

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Infants of obese mothers are at increased risk of congenital anomalies, stillbirth, prematurity macrosomia, and neonatal death. Intrauterine exposure to maternal obesity is also associated with an increased risk of developing obesity and metabolic disorders in childhood.

OBJECTIVE

Evaluating obstetric complications and perinatal outcomes in pregnant women with obesity (BMI \geq 30 kg/m²).

MATERIALS AND METHODS

The study was done at a tertiary care hospital in Amritsar, Punjab, India. This study is a prospective, longitudinal study. The study participants were pregnant women with increased BMI ($>$ 30 kg/m²) who were followed up in the OPD of the Department of Obstetrics and Gynaecology from December 2020 to December 2021.

Table 1: The WHO classification of obesity

| Term | Definition |
|-------------------|--------------------------------|
| Obesity | BMI >30–39 kg/m ² |
| Class I obesity | BMI >30–34.9 kg/m ² |
| Class II obesity | BMI >35–39.9 kg/m ² |
| Class III obesity | BMI >40 kg/m ² |
| Morbid obesity | BMI >40–49 kg/m ² |
| Superobesity | BMI >50 kg/m ² |

Table 2: Demographic data of pregnant females

| Socioeconomic status (n = 80) | Number | % |
|-------------------------------|--------|------|
| Uppers | 3 | 3.8 |
| Upper middle | 18 | 22.5 |
| Lower middle | 37 | 46.3 |
| Upper lower | 21 | 26.3 |
| Lower | 1 | 1.3 |
| <i>Area of habitat</i> | | |
| Rural | 36 | 45.0 |
| Urban | 44 | 55.0 |

At the first antenatal visit, demographic data, height, and weight were collected. The BMI was calculated as weight/height squared (kg/m²). Socioeconomic status was evaluated using modified Kuppuswamy scale.⁸ Study participants were counseled regarding maternal and fetal adverse effects associated with obesity. They were screened for GDM by oral glucose tolerance test (OGTT) or Diabetes in Pregnancy Study Group of India (DIPSI). They were advocated for regular antenatal visits, vitals and weight of the study participants were recorded at each visit. They were followed till delivery and were categorized according to a period of gestation at the time of delivery. Perinatal outcome in terms of need to stay in neonatal intensive care unit (NICU). Obese females were counseled for lifestyle modification in order to maintain normal BMI.

Inclusion Criteria

- Pregnant females of 20–40 years of age with viable pregnancy confirmed with ultrasound.
- At the first antenatal visit, pregnant females in their first trimester with BMI above 30 kg/m² were selected.

Exclusion Criteria

- Pregnancy with above 12 gestational weeks.
- Multifetal pregnancy.
- Patients with any chronic surgical or medical ailment.

RESULTS

Study participants with increased BMI were selected from their first antenatal visit and were followed till delivery. Out of these, 36 were from the rural areas, and 44 were from the urban areas of habitat. Their socioeconomic status was evaluated using the modified Kuppusway scale (Table 2). Depending on their weight at the first antenatal visit, BMI was calculated (Fig. 1).

The maternal and fetal outcome was studied in them. Maximum study participants developed GDM which was seen in 42.5% of the study participants (*p* = 0.060), 23.75% of study participants developed both GDM and HDP (*p* = 0.564), 17.5% study participants developed only HDP (*p* = 0.980), 12.5% of study participants

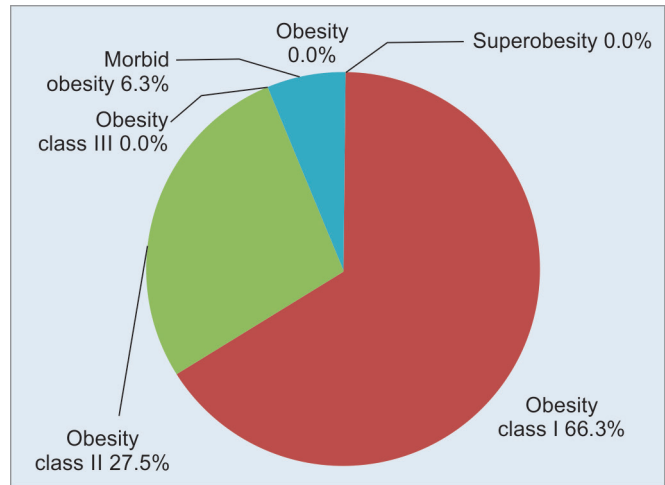


Fig. 1: Distribution according to BMI of study participants

developed FGR (*p* = 0.001), and 3.75% of study participants lost to follow-up (Table 3).

Out of 80 participants, 57.5% underwent cesarean section, and 38.8% were delivered vaginally and out of which 4.3% were lost to follow-up at antenatal visits (Fig. 2). Also, 41.4% of total participants delivered preterm and 68.6% at term; 48% of neonates required NICU stay (Table 4).

Out of five morbidly obese patients, one developed peripartum cardiomyopathy and required ventilatory support, three had surgical site infection out of which two required resuturing and one of them had fish mouth like opening of stitch line.

A gravida 5, para 2, live 1, and abortion 2 unbooked patient with 35 weeks period of gestation with previous two lower segment cesarian section (LSCS) with FGR with hemolysis elevated liver enzymes low platelet count (HELLP) with BMI of 42.3 kg/m² with severe anemia with hemoglobin of 6 gm%, with thrombocytopenia (platelet count: 70000/mm²; LDH: 3200 IU/mL) presented with breathlessness and was diagnosed with peripartum cardiomyopathy and was managed with a multidisciplinary approach.

An elderly primigravida with 34 weeks period of gestation with BMI of 41.6 kg/m² came into labor with full cervical dilatation. Because of obesity patient was unable to bear down and thus landed up in a difficult delivery and the baby was shifted to the nursery in view of prematurity.

A patient with a history of secondary infertility with morbid obesity lost 20-kg weight over the span of 1 year with lifestyle modification and conceived spontaneously.

DISCUSSION

Obesity during pregnancy is associated with many maternal and perinatal risks. According to the National Family Health Survey (NFHS), the percentage of ever-married women aged 15–49 years who are overweight or obese increased from 11% in NFHS-2 to 15% in NFHS-3. The obesity prevalence was seen more in women of age between 40–49 years (23.7%), residing in urban areas (23.5%) having high qualification (23.8%), belonging to the Sikh community (31.6%) and with families falling in high wealth quintiles (30.5%). Overweight and obesity is more than 3 times prevalent in the urban areas than in the rural areas.⁹



Table 3: Distribution of obese study participants developing complications

| | GDM (n = 34) | | GDM and HDP (n = 19) | | HDP (n = 14) | | FGR (n = 10) | |
|------------------|--------------|------|----------------------|------|--------------|------|--------------|------|
| | Number | % | Number | % | Number | % | Number | % |
| Obesity class I | 18 | 52.9 | 11 | 57.9 | 9 | 64.3 | 3 | 30.0 |
| Obesity class II | 14 | 41.2 | 6 | 31.6 | 4 | 28.6 | 4 | 40.0 |
| Morbid obesity | 2 | 5.9 | 2 | 10.5 | 1 | 7.1 | 3 | 30.0 |
| Superobesity | 0 | | 0 | | 0 | | 0 | |
| p-value | 0.060 | | 0.564 | | 0.980 | | 0.001 | |

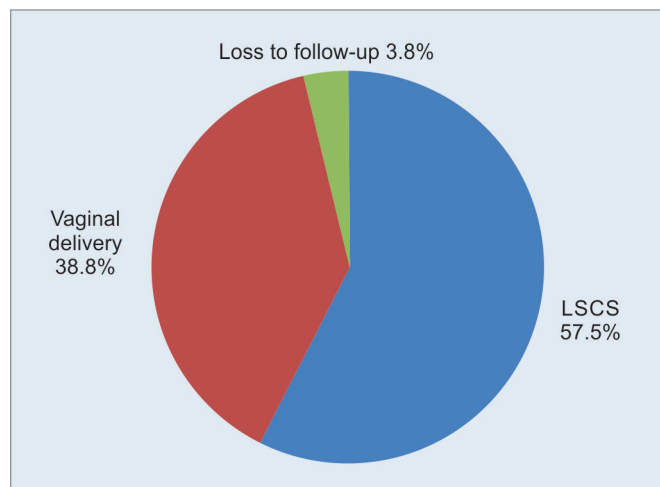


Fig. 2: Mode of delivery in obese pregnant females

Table 4: Outcome of pregnancy in obese pregnant patients

| Outcome (n = 77) | Number | % |
|-------------------------------------|--------|-------|
| Term delivery | 48 | 68.57 |
| Preterm delivery | 29 | 41.40 |
| Neonates required neonatal ICU stay | 34 | 48.57 |
| Neonates did not require NICU stay | 43 | 61.42 |

According to a study by Catena et al., from the total of obese pregnant patients, 20% had pre-eclampsia, 24% gestational diabetes, and 44% had both GDM and HDP.¹⁰

Weiss et al. studied 16,100 patients and they found significant association of obesity with gestational hypertension (OR: 2.5 and 3.2), gestational diabetes (or 2 and 2.4)¹¹ between women with normal prepregnancy BMI (20–24.9 kg/m², N = 9,171) and those with an obese prepregnancy BMI (≥30, N = 3,744). Rates of pregnancy complications and neonatal outcomes were also evaluated by the level of obesity [obese (30–34.9 kg/m², N = 2,106), severe obesity (35–39.9 kg/m², N = 953), and morbid obesity (≥40 kg/m², N = 685)]. Rates of gestational diabetes [12.0% vs 3.7%, p < 0.001, odds ratio (95% confidence interval) = 3.5 (3.0, 4.1)] and gestational hypertension [30.9% vs 9.0%, p < 0.001, odds ratio (95% confidence interval) = 4.5 (4.1–5.0)] were higher for obese vs normal BMI gravidas, respectively.¹²

According to the study by Mandal et al.¹² done on 422 prepregnant obese women, obese pregnant women were at increased risk of GDM (19.43 vs 3.79%, p < 0.001), pregnancy induced hypertension (12.32 vs 2.36%, p < 0.001), pre-eclampsia (8.76 vs

3.31%, p < 0.001), preterm labor in less than 34 week gestation (7.58 vs 3.55%; p < 0.001), cesarean section (36.72 vs 17.53%, p < 0.001), instrumental deliveries (12.32 vs 5.21%, p < 0.001) and postpartum infection morbidities (9.95 vs 3.79%, p < 0.001). These women were more prone to develop overt diabetes (2.36% vs 0) and chronic hypertension (5.21 vs 0.47%) in future as well.¹³

Primary care services should ensure that all women of childbearing age have the opportunity to optimize their weight before pregnancy. Women should be informed that weight loss between pregnancies reduces the risk of stillbirth, hypertensive complications and fetal macrosomia.

Weight loss increases the chances of successful vaginal birth after cesarean (VBAC) section.⁷

Obese women wishing to become pregnant should be advised to take 5-mg folic acid supplementation daily, starting at least 1 month before conception and continuing during the first trimester of pregnancy.

All maternity units should have a documented environmental risk assessment regarding the availability of facilities to care for pregnant women with a booking BMI of 30 kg/m² or greater. This risk assessment should address the following issues: circulation space, accessibility including doorway widths and thresholds, safe working loads of equipment and floors, appropriate theatre gowns, equipment storage, transportation, staffing levels and availability of/and procurement process for specific equipment including large blood pressure cuffs, appropriately sized compression stockings and pneumatic compression devices, sit-on weighing scale, large chairs without arms, large wheelchairs, ultrasound scan couches, ward and delivery beds, mattresses, theatre trolleys, operating theatre tables and lifting and lateral transfer equipment.

Bariatric Surgery

Women should be supported to lose weight postpartum and offered referral to weight management services. Preconception bariatric surgery can reduce the prevalence of obesity-related subfertility and adverse maternal, pregnancy, and birth outcomes.¹⁴ A minimum waiting period of 12–18 months after bariatric surgery is recommended before attempting pregnancy. Pregnancy can exacerbate nutritional deficiencies, so supplements should be provided accordingly.

CONCLUSION

Obesity is a clear contributor to a wide range of maternal and fetal complications. The risks associated with obesity in pregnancy cannot necessarily be influenced by the intervention. Preventive measures aimed at normalizing body weight before a woman becomes pregnant are, therefore, all the more important.

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