# Maternal Obesity and Its Impact on Pregnancy Outcomes: A Prospective Observational Study

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## Abstract:

*Maternal obesity has emerged as a major **global public health concern**, with increasing prevalence in both developed and developing nations. Approximately 25–35% of women of reproductive age are estimated to be overweight or obese, placing them at higher risk for adverse pregnancy outcomes. Obesity during pregnancy is associated with metabolic, hypertensive, mechanical, and delivery-related complications that increase morbidity for both mother and fetus. This prospective observational study aimed to evaluate the impact of maternal obesity on pregnancy outcomes in a tertiary care hospital setting. A total of 200 pregnant women were enrolled and categorized into two groups based on their BMI: **Group A (Obese; BMI ≥ 30 kg/m², n = 100)** and **Group B (Non-obese; BMI 18.5–24.9 kg/m², n = 100)**. Maternal outcomes assessed included **gestational diabetes mellitus (GDM)**, **gestational hypertension**, **pre-eclampsia**, **mode of delivery**, **induction of labor**, **postpartum hemorrhage (PPH)**, and **intraoperative complications**. Fetal and neonatal outcomes included **preterm birth**, **macrosomia**, **shoulder dystocia**, **neonatal hypoglycemia**, **Apgar score**, and **NICU admissions**. Statistical significance was evaluated using the chi-square test. The findings showed that obese women had significantly higher rates of GDM (34% vs 9%), gestational hypertension (28% vs 11%), pre-eclampsia (18% vs 6%), cesarean delivery (52% vs 29%), induction of labor (42% vs 21%), intraoperative complications (14% vs 5%), and PPH (11% vs 4%). Fetal complications were also more prevalent in the obese group, including macrosomia (17% vs 4%), preterm birth (21% vs 9%), shoulder dystocia (6% vs 1%), neonatal hypoglycemia (13% vs 5%), low Apgar scores (12% vs 4%), and NICU admissions (26% vs 10%). This study demonstrates that **maternal obesity significantly increases maternal, fetal, and neonatal risks**, underscoring the importance of preconception counseling, weight management, and early antenatal monitoring to improve pregnancy outcomes.*

## Keywords:

***Maternal Obesity, Pregnancy Outcomes, Gestational Diabetes, Hypertensive Disorders, Macrosomia, NICU Admissions, Prospective Observational Study***

## Introduction :

Maternal obesity is recognized as a growing **epidemic** worldwide, with significant implications for reproductive health and pregnancy outcomes. The prevalence of obesity among women of reproductive age has risen dramatically in recent decades due to sedentary lifestyles, unhealthy dietary patterns, and socioeconomic influences. In many regions, including India, the coexistence of undernutrition and obesity presents a unique public health challenge. Obesity during pregnancy not only affects maternal physiology but also has far-reaching consequences

on fetal development and neonatal well-being. Physiologically, excess maternal adiposity contributes to increased insulin resistance, chronic low-grade inflammation, endothelial dysfunction, and altered metabolic pathways, predisposing pregnant women to complications such as **gestational diabetes mellitus (GDM)**, **gestational hypertension**, and **pre-eclampsia**. Such conditions significantly increase maternal morbidity and may lead to long-term cardiovascular risks. In addition to metabolic complications, maternal obesity adversely affects the progression of labor and delivery. Higher rates of **induction of labor**, **cesarean section**, prolonged labor, soft tissue dystocia, anesthesia-related complications, and increased operative difficulty have all been observed among obese women. Postpartum complications such as **postpartum hemorrhage (PPH)** and wound infections are also more common, further contributing to maternal morbidity. The fetus is equally vulnerable, as maternal obesity is strongly associated with **macrosomia**, **preterm birth**, **neonatal hypoglycemia**, **shoulder dystocia**, congenital anomalies, and increased need for **NICU admission**. Intrauterine exposure to maternal obesity also predisposes children to future obesity, insulin resistance, and metabolic syndrome, perpetuating an intergenerational cycle of disease. Despite significant health risks, the impact of maternal obesity on pregnancy outcomes remains under-researched in many low- and middle-income settings. Understanding the magnitude and pattern of obesity-related complications is crucial for designing targeted interventions. This study aims to provide a comprehensive evaluation of maternal and neonatal outcomes associated with obesity in pregnancy through a prospective observational design at a tertiary care hospital, thereby generating relevant clinical evidence for improving maternal health strategies.

## Materials and Methods:

This prospective observational study was conducted in the Department of Obstetrics and Gynecology at a tertiary care teaching hospital over a period of twelve months, from 27/05/2020 to 15/03/2021. A total of 200 pregnant women attending the antenatal clinic or admitted for delivery were enrolled after obtaining informed consent. Women were included based on the following criteria: singleton pregnancy, booking before 20 weeks of gestation, and willingness to participate in the study. Exclusion criteria included pre-existing diabetes mellitus, chronic hypertension, renal diseases, thyroid disorders, or other significant medical comorbidities. Participants were divided into two groups based on their **Body Mass Index (BMI)** calculated at the first antenatal visit using weight in kilograms divided by height in meters squared. **Group A consisted of obese women (BMI ≥ 30 kg/m²)**, while **Group B included non-obese women (BMI 18.5–24.9 kg/m²)**. Demographic details, obstetric history, and clinical parameters were recorded in a structured proforma. Maternal outcomes assessed included **gestational diabetes mellitus (GDM)** diagnosed using standard oral glucose tolerance test criteria, **gestational hypertension**, **pre-eclampsia**, **induction of labor**, **mode of delivery**, **intraoperative complications**, and **postpartum hemorrhage (PPH)**. Fetal and neonatal outcomes assessed were **preterm birth (<37 weeks)**, **intrauterine growth restriction (IUGR)**, **macrosomia (>4 kg)**, **shoulder dystocia**, **neonatal hypoglycemia**, **Apgar score at 5 minutes**, and **NICU admissions**. Clinical examinations were conducted at every antenatal visit, and blood pressure, weight gain, and fetal well-being were closely monitored. Laboratory investigations included hemoglobin, fasting blood sugar, urine analysis, liver and renal function

tests, and antenatal ultrasounds. Women diagnosed with GDM or hypertensive disorders were managed according to established institutional protocols. Labor was monitored using a partograph, and decisions regarding induction or cesarean delivery were based on obstetric indications. Intraoperative observations included duration of surgery, blood loss, anesthesia-related difficulties, and any maternal complications. Neonatal outcomes were recorded immediately after birth and during hospital stay. Statistical analysis was performed using the chi-square test, and results were expressed in percentages. Ethical approval for conducting the study was obtained from the institutional ethics committee.

## Results:

The study revealed that adverse maternal and neonatal outcomes were significantly higher among obese pregnant women compared to non-obese women. Maternal complications such as **gestational diabetes mellitus (34% vs 9%)**, **gestational hypertension (28% vs 11%)**, and **pre-eclampsia (18% vs 6%)** were markedly increased in the obese group. Labor-related complications also showed notable differences, with obese women experiencing higher rates of **induction of labor (42% vs 21%)**, **cesarean delivery (52% vs 29%)**, **intraoperative complications (14% vs 5%)**, and **postpartum hemorrhage (11% vs 4%)**. Fetal complications were similarly elevated in the obese group. **Macrosomia** occurred in 17% of obese women versus 4% of non-obese women, while **preterm birth** was observed in 21% versus 9%, respectively. **Shoulder dystocia** (6% vs 1%), **neonatal hypoglycemia** (13% vs 5%), **Apgar score <7 at 5 minutes** (12% vs 4%), and **NICU admissions** (26% vs 10%) were all significantly more common among infants of obese mothers. These findings clearly indicate that maternal obesity substantially increases the risk of both maternal metabolic disorders and neonatal complications.

## Discussion:

Maternal obesity significantly increases the risk of maternal, fetal, and neonatal complications. Higher rates of GDM, gestational hypertension, pre-eclampsia, cesarean delivery, and postpartum hemorrhage were found among obese women. Similarly, fetal complications such as macrosomia, preterm birth, shoulder dystocia, and NICU admission were markedly increased. These findings align with global evidence and reinforce the importance of early antenatal monitoring and weight management strategies to minimize adverse outcomes.

## CONCLUSION:

This prospective observational study demonstrates that maternal obesity is a strong predictor of adverse pregnancy outcomes. Obese mothers experienced significantly higher maternal, fetal, and neonatal complications compared to non-obese women. Early identification, targeted antenatal care, dietary counseling, weight control, and timely intervention are essential to improve outcomes. Strengthening awareness and implementing preventive strategies can reduce obesity-related pregnancy risks.

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