

Impact of Maternal Obesity on Maternal and Perinatal Outcomes: A Comparative Analytical Study at a Tertiary Care Hospital

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Abstract

Background: Maternal obesity has emerged as a major public health concern and is associated with several adverse maternal and neonatal outcomes. The aim is to compare maternal and perinatal outcomes in obese and non-obese women admitted for delivery at a tertiary care hospital. **Material and Methods:** A prospective comparative analytical study was conducted among 100 pregnant women (50 obese and 50 non-obese). Pre-pregnancy/first trimester BMI was calculated using available records. Maternal comorbidities, labour details, mode of delivery and immediate neonatal outcomes were compared between the groups. **Results:** Maternal obesity showed significant association with pregnancy-induced hypertension ($p=0.011$), non-severe preeclampsia ($p=0.0038$), caesarean delivery ($p=0.0013$) and preterm delivery ($p=0.0018$). No significant association was observed with gestational diabetes mellitus, induction of labour, hypothyroidism, birth weight, NICU admission or postpartum complications. **Conclusion:** Pre-pregnancy obesity is associated with increased obstetric morbidity, particularly hypertensive disorders, caesarean section and preterm delivery. Early identification and targeted antenatal surveillance are essential for improving maternal and neonatal outcomes.

Keywords: Maternal obesity, Pregnancy-induced hypertension, Caesarean section, Preterm delivery, Perinatal outcome, Body mass index.

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INTRODUCTION

Obesity is one of the fastest growing non-communicable health problems worldwide. In pregnancy, obesity has been associated with hypertensive disorders, gestational diabetes mellitus, dysfunctional labour, operative delivery and adverse neonatal outcomes (1). The prevalence of obesity in pregnancy is increasing in India due to changing dietary habits, reduced physical activity and increasing urbanization. Women with increased pre-pregnancy BMI require closer antenatal monitoring because obesity influences maternal metabolism, placental function and labour dynamics (2). Data from North Karnataka regarding the impact of maternal obesity on delivery outcomes are limited. Therefore, the present study was undertaken to compare maternal and perinatal outcomes in obese and non-obese women admitted for delivery at a tertiary care hospital.

Aim and Objectives

Aim: To compare maternal and perinatal outcomes in obese and non-obese women admitted for delivery.

- To study the prevalence of obstetric complications such as gestational diabetes mellitus, hypertensive disorders and thyroid disorders in obese pregnant women.
- To analyze labour characteristics and mode of delivery in obese women.
- To assess immediate maternal and neonatal outcomes.

Study design: Prospective comparative analytical study.

Study setting: Department of Obstetrics and Gynaecology, SDM Medical College and Hospital, Dharwad.

Study period: One year.

Sample size: 100 women (50 obese and 50 non-obese).

BMI classification: Cases: BMI ≥ 25 kg/m²; Controls: BMI < 25 kg/m². (according to Asia-Pacific guidelines) (3)

Inclusion criteria: Pregnant women aged 18-40 years admitted for delivery with available pre-pregnancy or first trimester weight records.

Exclusion criteria: Age < 18 years or > 40 years and women unwilling to participate.

Data collection: Height was measured using a stadiometer. Pre-pregnancy/first trimester BMI was calculated using Quetelet's index: BMI = weight (kg)/height² (m²). Participants were followed until delivery and immediate postpartum period. Maternal comorbidities, labour details, mode of delivery,

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MATERIALS AND METHODS

gestational age, birth weight and NICU admission were recorded.

Statistical analysis: Data were entered in Microsoft Excel

and analyzed using SPSS software. Categorical variables were compared using Chi-square test. A p-value <0.05 was considered statistically significant.

RESULTS

Table 1: Demographic characteristics

Variable	Obese (n=50)	Non-obese (n=50)
Mean age (years)	28.64 ± 3.53	25.76 ± 2.12
Mean height (cm)	154.79 ± 3.53	155.20 ± 6.36
Mean weight (kg)	75.76 ± 19.09	54.78 ± 7.78
Mean BMI (kg/m ²)	31.33 ± 5.91	22.60 ± 1.31

Women aged ≥30 years were significantly more common in the obese group (22% vs 10%, p=0.011).

Table 2: Antenatal comorbidities

Comorbidity	Obese	Non-obese
Pregnancy-induced hypertension	18	7
Non-severe preeclampsia	15	1
Severe preeclampsia	3	5
Impaired glucose tolerance	5	3
GDM on insulin	5	1
Hypothyroidism	10	8

Pregnancy-induced hypertension was significantly associated with obesity (p=0.011). Non-severe preeclampsia was also significantly higher in obese women (p=0.0038).

Table 3: Labour characteristics

Variable	Obese	Non-obese	p-value
Induction of labour	19	21	0.862
Spontaneous labour	15	18	NS

There was no significant association between obesity and induction of labour.

Table 4: Mode of delivery

Mode of delivery	Obese	Non-obese	p-value
Caesarean section	36 (72%)	20 (40%)	0.0013
Vaginal delivery	14 (28%)	30 (60%)	

Table 5: Gestational age at delivery

Gestational age	Obese	Non-obese	p-value
Preterm	15 (30%)	3 (6%)	0.0018
Term	35 (70%)	47 (94%)	

Table 6: Neonatal outcomes

Outcome	Obese	Non-obese	p-value
NICU admission	7 (14%)	2 (4%)	0.065
Stillbirth	3 (6%)	0	-

Birth weight distribution did not differ significantly between the groups.

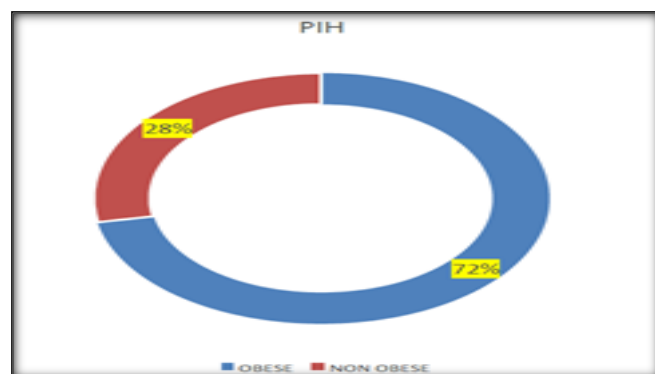


Figure 1: PIH in obese vs non-obese

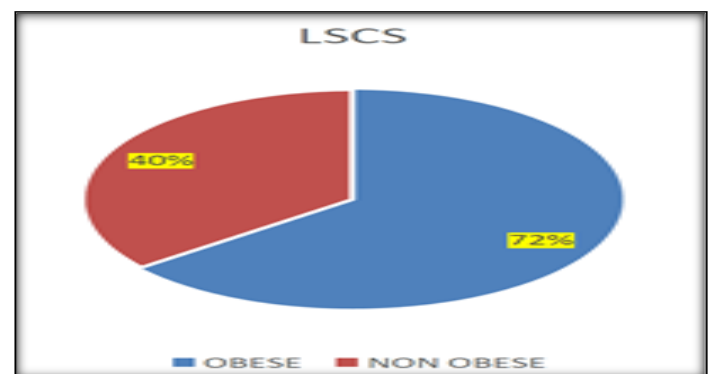


Figure 2: Distribution of LSCS

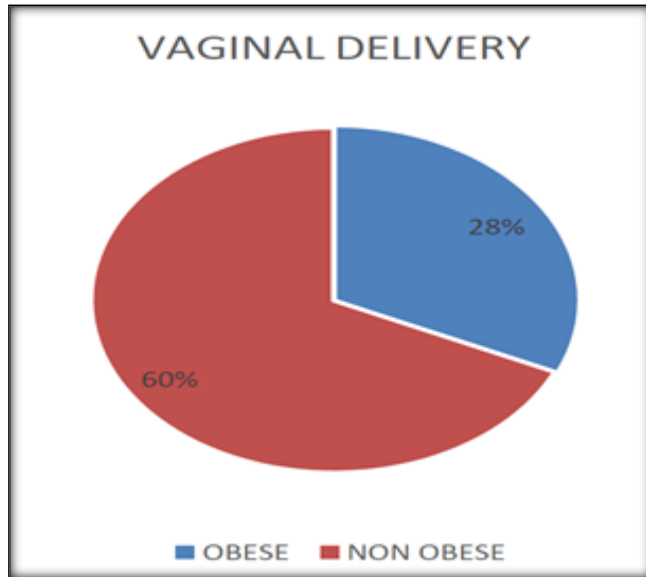


Figure 3: Distribution of vaginal delivery

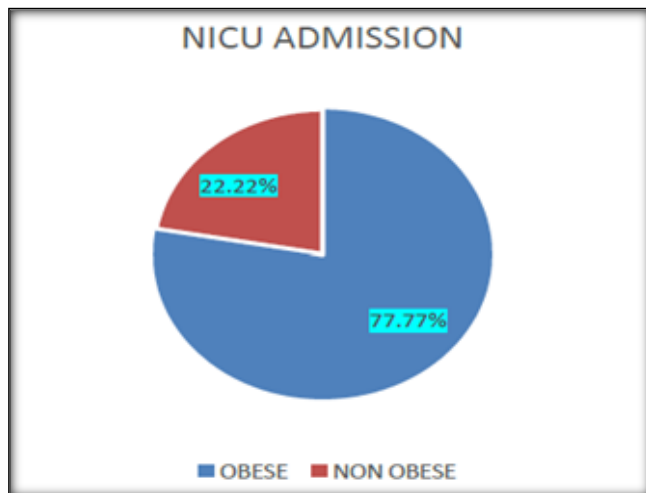


Figure 4: NICU admission in cases vs control

Postpartum Complications

- Three cases of atonic postpartum haemorrhage were observed in the obese group.
- One case each of Couvelaire uterus and wound infection occurred in the obese group.
- No significant postpartum complications were observed in the non-obese group.

DISCUSSION

A study by Prabha NC et al which recruited 100 antenatal women had results as follows- higher rates of caesarean delivery (56% vs. 30%, $p=0.01$), labour induction (72% vs. 14%, $p=0.01$), and prolonged hospital stay (>5 days, 78% vs. 14%, $p=0.001$) in obese women as compared to women with normal pre pregnancy BMI.^[6]

Vinutha BR et al,^[7] conducted a prospective observational study to assess the effect of pre-pregnancy BMI on the mode

of delivery and concluded increased rates of caesarean delivery in obese women (100%) versus overweight women (62.5%) versus normal BMI women (25%). The study also found higher incidence of GDM (50%), hypertensive disorder of pregnancy (50%) in obese women.

A single-center retrospective cohort study conducted by Zlatina Nikolova et al,^[8] revealed 46.36% of the women in the study were obese and 15.99% of the women in the cohort suffered from hypertensive disorder of pregnancy.

Maternal obesity was significantly associated with pregnancy-induced hypertension, non-severe preeclampsia, caesarean delivery and preterm birth. No significant association was found with gestational diabetes mellitus, induction of labour, birth weight, NICU admission or postpartum complications. Pre-pregnancy BMI should be assessed routinely, and obese women should receive focused antenatal counselling, weight management advice and intensified surveillance for hypertensive disorders and preterm birth.

CONCLUSION

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Nil.

Conflicts of interest

There are no conflicts of interest.

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