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# A Comparative Study of Maternal and Fetal Outcome in Obese Non- Obese Pregnant Women

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## ABSTRACT

**Objective:** The aim of this study is to determine the adverse pregnancy outcomes in obese and non- obese women.
**Study Design:** Randomized controlled trial
**Place and Duration:** Department of Gyne & Obs, Shahida Islam Teaching Hospital Lodhran, during from 01-07-2020 to 31-07-2021.
**Methods:** Total one hundred and eighty patients were enrolled in this study. Patients were aged between 18- 50 years. Patients detailed demographics were recorded after taking written consent. Patients were equally divided into two groups I and II. 90 obese patients were included in group I and equally non-obese patients were included in group II. Frequency of pre-eclampsia, gestational diabetes mellitus and post-partum haemorrhage were calculated. Adverse outcomes (cesarean section, instrumental delivery, induction of labor and prolong labor, hypertensive disorder) were also calculated among both groups. Fetal outcomes were perinatal mortality, Low birth weight, Low Apgar score and NICU admission were observed. Complete data was analyzed by SPSS 24.0 version.
**Results:** Mean age of the patients in group I was 34.12±4.59 years with mean BMI 31.12±8.67 Kg/m$^2$ and in group II mean age was 26.13 ±5.78 years with mean BMI 23.03±9.48 Kg/m$^2$. Frequency of pre-eclampsia in obese group I were high among 40 (44.4%) patients as compared to group II 9 (10%) patients , frequency of gestational diabetes mellitus in group I was among 21 (23.3%) patients and 6 (6.7%) patients were in group II, post partum haemorrhage was seen in 57 (63.3%) cases in group I and 29 (32.2%) cases in group II. Fetal outcomes, perinatal mortality in group I 5 (5.5%) and in group II was 4 (4.4%), low birth weight in group I was among 21 (23.3%) and in group II was 45(50%), low apgar score in group I was 14 (15.5%) and in group II was 9 (10%), 43 (47.8%) in group I went to NICU admission and 28 (31.1%) patient in group II admitted to NICU.
**Conclusion:** Pregnancy-related complications such as gestational diabetes, pre-term labour, and pre-eclampsia are more likely in obese women, according to our data. Having a baby with a woman who is obese might lead to serious difficulties for both mother and baby. Maternal obesity is connected with an increased risk of feto-maternal morbidity and mortality.
**Keywords**: Pre-eclampsia, Gestational diabetes, Partum haemorrhage, Apgar score, NICU

## INTRODUCTION

In recent years, obesity has begun to be considered a global health problem. It is the fifth leading cause of death worldwide. Obesity is a condition of abnormal and excessive fat accumulation in adipose tissue, leading to adverse health effects. The significant contributors to weight gain, which may eventually lead to obesity, are decreased physical activity, increased dietary fat intake, and genetic factors [1]. The rise in obesity is associated with advanced age, which becomes apparent when considering the decrease in older adults' physical activity and metabolic processes. Marital status, high educational level, alcohol use, and high socioeconomic status are other factors associated with obesity [2]. Obesity is measured using various methods, including body mass index (BMI), waist circumference (WC), waist-hip ratio, skinfold, and percent body fat measurements. BMI is the most frequently used diagnostic tool in the current classification system of obesity [3]. It is calculated by dividing weight in kilograms by height in square meters. The World Health Organization (WHO) divided BMI values into six categories to define different body weights, from underweight to obesity. These categories are underweight (less than 18.5), average weight (18.5–24.9), overweight (25.0–29.9), obesity class I (30.0–34.9), obesity class II (35.0–39.9), and obesity class III (40.0 or greater) [4]. Overweight and obesity have become the most general nutritional problems globally, as they impose significant burdens on health care systems. Obesity affects 2.1 billion people (almost one-third) in the world. If the current trend continues, this figure may reach nearly half of the world's adult population by 2030 [5].

Moreover, obesity is associated with multiple diseases and may result in the death of millions of people every year. Furthermore, the risk of non-communicable diseases (NCD), such as hypertension (HTN), type 2 diabetes mellitus (T2DM), dyslipidemia, and cardiovascular disease (CVD), increases dramatically with obesity. Besides, obstructive sleep apnea and osteoarthritis relate to obesity [6]. Females were to have a higher rate of obesity. Its prevalence doubled between 1980 and 2008, from 8% in 1980 to 14% in 2008. The highest incidence of overweight and obesity in 2013 was in North Africa and the Middle East, where more than 65% of reproductive-age females were overweight or obese [6]. According to a study of overweight and obesity in Saudi women of childbearing age, the following rates of obesity were found: 22.4% were obesity class I, 11.1% were obesity class II, and 6.6% were morbidly obese (obesity class III) [6]. Furthermore, Saudi women have exceptional obstacles that can predispose them to a sedentary lifestyle, such as the essential wearing of abaya or full-length overgarment in public, gender segregation, and activities that are primarily at home [7,8]. Maternal obesity is one of the central risk factors for adverse pregnancy outcomes, including gestational diabetes mellitus (GDM), operative delivery, and stillbirth [9]. The prevalence of hypothyroidism among Saudi pregnant women is 13%, most of them were in their third trimester [10].

Maternal obesity increases perinatal mortality, which increases the risk of perinatal death and preterm birth, macrosomia, congenital anomaly, childhood obesity, and stillbirth. Also, maternal obesity is related to a higher risk of cesarean deliveries and a higher incidence of anesthetic and postoperative complications. Another major complication is preeclampsia, a specific syndrome characterized by new onset of hypertension with proteinuria that occurs after 20 weeks gestation. The actual cause of preeclampsia is unknown, but it is estimated to affect 2 to 8% of all pregnancies [11,12].

The purpose of this study is to determine the adverse pregnancy outcomes in obese and non- obese women.

## MATERIAL AND METHODS

This randomized control trial was conducted at- Department of Gyne & Obs, Shahida Islam Teaching Hospital Lodhran, during

from 01-07-2020 to 31-07-2021 and comprised of 180 patients. Patients detailed demographics were recorded after taking written consent. Patients with placenta previa, history of recurrent miscarriages, previous uterine scars were excluded from this study.

Study was conducted after approval from the Ethical Committee of the Institution. Patients were equally divided into two groups I and II. Group had 90 obese patients and group II was with hundred non-obese patients. Patient's BMI was measured by obtaining height and weight in the outpatient department. Patients were followed till delivery. The outcome variable (i.e. pre-eclampsia, gestational diabetes mellitus and post-partum haemorrhage) were noted in the Performa by the researcher. Adverse outcomes (cesarean section, instrumental delivery, induction of labor and prolong labor,) were also calculated among both groups.The mean and standard deviation for patients' age and gestational ages have been determined using descriptive statistics. The outcome variables, i.e. preeclampsia, gestational diabetes mellitus, and postpartum bleeding were measured at rates and percentages. Fetal outcomes were perinatal mortality, Low birth weight, Low Apgar score and NICU admission were observed. Complete data was analyzed by SPSS 24.0 version.

## RESULTS

Mean age of the patients in group I was 34.12±4.59 years with mean BMI 31.12±8.67 Kg/m$^2$ and in group II mean age was 26.13 ±5.78 years with mean BMI 23.03±9.48 Kg/m$^2$. Mean gestational age of group I was 36.71±4.44 weeks while in group II mean gestational age was 37.08±3.51 weeks. Mean parity in-group I was 5.03±3.22 while in group II it was 4.11±2.41. (table1)

Table 1: Baseline detailed demographics of presented patients

| Variables | Group I | Group II |
|---|---|---|
| Mean age (years) | 34.12±4.59 | 26.13 ±5.78 |
| Mean BMI | 31.12±8.67 | 23.03±9.48 |
| Gestational age (weeks) | 36.71±4.44 | 37.08±3.51 |
| Mean Parity | 5.03±3.22 | 4.11±2.41 |

Frequency of pre-eclampsia in obese group I were high among 40 (44.4%) patients as compared to group II 9 (10%) patients , frequency of gestational diabetes mellitus in group I was among 21 (23.3%) patients and 6 (6.7%) patients were in group II, post partum haemorrhage was seen in 57 (63.3%) cases in group I and 29 (32.2%) cases in group II. (table 2)

Table 2: Frequency ofpre-eclampsia, Gestational Diabetes and Post Partum Haemorrhage among study cases

| Variables | Group I(n=90) | Group II (n=90) |
|---|---|---|
| Pre-eclampsia | | |
| Yes | 40 (44.4%) | 9 (10%) |
| No | 50 (55.6%) | 81(90%) |
| Gestational Diabetes | | |
| Yes | 21 (23.3%) | 6 (6.7%) |
| No | 69 (77.7%) | 84 (93.3%) |
| Post Partum Haemorrhage | | |
| Yes | 57 (63.3%) | 29 (32.2%) |
| No | 33 (36.7%) | 61 (67.8%) |

Table 3: Frequency of adverse outcomes among both groups

| Maternal Outcomes | Group I | Group II |
|---|---|---|
| Cesarean section | 30 (33.3%) | 10 (11.11%) |
| Instrumental delivery | 9 (10%) | 4 (4.4%) |
| Induction of labor | 19 (21.1%) | 7 (7.8%) |
| Prolong labor | 8 (8.9%) | 2 (2.2%) |
| Fetal Outcomes | | |
| Perinatal mortality | 5 (5.5%) | 4 (4.4%) |
| low birth weight | 21 (23.3%) | 45(50%), |
| low apgar score | 14 (15.5%) | 9 (10%) |
| NICU admission | 43 (47.8%) | 28 (31.1%) |

Frequency of adverse outcomes (cesarean section, instrumental delivery, induction of labor and prolong labor,) in obese group were significantly higher than that of non-obese. Fetal outcomes, perinatal mortality in group I 5 (5.5%) and in group II was 4 (4.4%), low birth weight in group I was among 21 (23.3%) and in group II was 45(50%), low apgar score in group I was 14 (15.5%) and in group II was 9 (10%), 43 (47.8%) in group I went to NICU admission and 28 (31.1%) patient in group II admitted to NICU. (table 3)

## DISCUSSION

In many cases, obesity is a substantial contributor to increased morbidity and death, such as heart disease, type 2 diabetes, and cancer. Pre-eclampsia, premature births, gestational diabetes, and caesarean deliveries are all elevated when a woman is obese during pregnancy. These perinatal difficulties are exacerbated by a lack of treatment options that address the root causes of these issues. Women planning their first pregnancies are more at risk from the effects of obesity, according to recent epidemiological studies.

In this study 180 pregnant obese and non-obese women were presented. Patients were equally divided into two groups I and II. 90 obese patients were included in group I and equally non-obese patients were included in group II. Pre-eclampsia was observed 44.4% in obese group was greater than that of non-obese group 10%. These results were comparable to the previous study conducted by Ahmed SR et al. [11] According to findings from this study, the majority of obstetric complications are more likely to occur in obese women than in non-obese women, with the exception of hyperemesis gravidarum, which is more common in obese women. According to Doherty et al, obese women are 1.5 times more likely to suffer from hyperemesis gravidarum than non-obese women. [12] Pregnancy-related hypertension and preeclampsia are more common among obese women, according to our research.

In our study gestational diabetes mellitus was higher 23.3% in obese patients as compared to non-obese 6.7%. In other study gestational diabetes mellitus was significantly more common in obese pregnant women (odds ration (99% confidence interval) for BMI 25–30 and MBI ≥30 respectively (1.53 – 1.84), 3.6 (3.25–3.98). [13,14] Frequency of post-partum haemorrhage in obesity patients were 63.3% relatively greater than that of control group patients 32.2%. [15-17]

The rate of cesarean delivery in obese group was 33.3%, a higher percentage as compared to the rate of cesarean sections in group I was 11.11%, these results were greater than that of studies conducted in the Portuguese NHS hospitals in 2016 (23.5%). [18] In this study, the amount of adverse effects to instrumental delivery, prolonged work and labour induction (10%, 8.9%, 21.1%) was higher than usual classes. GD and GD are both independent factors of concern for cesaricdelivery[19,20]. The growing obesity epidemic, in order to have an effect both of maternal hyperglycemia and obesity, is important to compare pregnancy results in overweight and obese women with and without GD. Martin and cols, for example. In the obesity women who were independent of GD. [21]Blickstein and cols indicated an increased risk of caesarean delivery and LGA newborns. Fetal outcomes, perinatal mortality in group I 5 (5.5%) and in group II was 4 (4.4%), low birth weight in group I was among 21 (23.3%) and in group II was 45(50%), low apgar score in group I was 14 (15.5%) and in group II was 9 (10%), 43 (47.8%) in group I went to NICU admission and 28 (31.1%) patient in group II admitted to NICU. Only obesity [22] and, more recently, Huett& Colls were affected by the possibility of preeclampsia and macrosomia. The risk of macrosomal disease in obese women without GD is higher compared with GD and the risk of caesarean section substantially increases and maternal morbidity is considerably higher in obese women irrespective of diabetes regulation.[22]

## CONCLUSION

Pregnancy-related complications such as gestational diabetes, pre-term labour, and pre-eclampsia are more likely in obese

women, according to our data. Having a baby with a woman who is obese might lead to serious difficulties for both mother and baby. Maternal obesity is connected with an increased risk of feto-maternal morbidity and mortality.

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