

ORIGINAL ARTICLE

Frequency of Pre-Eclampsia in Obese Primigravida Compared to Non-Obese Primigravida

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ABSTRACT

Objective: The purpose of this study is to compare the prevalence of pre-eclampsia in obese primigravida compared to those who are not obese.

Study Design: Prospective cohort study

Place and Duration of Study: The research was conducted at the Gynecology and Obstetrics Department at the bahawal Victoria hospital Bahawalpur from 01 June 2021 to 31 December 2021.

Materials and Methods: The study consisted of sixty (60) patients, selected using a non-probability consecutive sampling technique. All primigravida between the ages of 20 and 35, with singleton pregnancies of >26 weeks and with a BMI>30kg/m² in the obese group and BMI<30kg/m² in the non-obese group, were included. This data was collected on a specially designed Performa. An analysis of the data was conducted using SPSS version 16. Frequency and percentage were calculated for qualitative variables, such as pre-eclampsia (present/absent). Using Chi-square, we compared the frequency of pre-eclampsia. A p-value <0.05 was considered significant.

Results: The range of age of participants in the study ranged from 20 to 35 years, with a mean age of 27.08 ± 3.59 years. The mean gestational age was 34.65 ± 4.35 weeks. The mean BMI in group A was 37.50 ± 5.47 kg/m², while in group B it was 26.77 ± 3.64 kg/m². The frequency of preeclampsia in Group A (obese primigravida group) was 43.33% (13%), while in group B (non-obese primigravida group) it was 13.33% (4%).

Conclusion: The results of this study suggest that the frequency of preeclampsia in obese primigravida is higher compared to non-obese primigravida (43.33% versus 13.33%). This shows that obesity is a risk factor for preeclampsia and that there exist a positive relation between BMI and preeclampsia.

Keywords: Obese Primigravida, Pre-eclampsia, Eclampsia, Risk Factors for Pre-eclampsia – Eclampsia, High risk pregnancy, Complicated during pregnancy. Obesity and Pregnancy.

INTRODUCTION

Obesity is a disorder in which excessive fat buildup causes a rise in body weight, and it is widespread in developed and rich nations. The standard definition of obesity is a BMI more than 30 kg/m^{1,2}. The World Health Organization (WHO) identifies obesity as one of the most evident yet underappreciated public health threats to both developed and developing nations. WHO classifies it as a significant public health concern and potentially fatal illness. More than 1.2 billion individuals worldwide are affected by obesity issues, according to the WHO's "World report," and epidemiological studies indicate that 22% of the adult population is obese³.

There has been an increase in the incidence of obesity among pregnant women, which has increased the severity of issues associated with obesity. These difficulties can be grouped according to whether they primarily impact the mother or the foetus, infant, or older kid. Maternal obesity is associated with an increased risk of adverse pregnancy outcomes, including gestational diabetes, c-section pregnancy-induced hypertension, infectious illness, postpartum haemorrhage, delivery of large-than-expected-for-gestational-age infants, and more recently, stillbirth^{4,5}.

Pre-eclampsia is a medical condition that affects pregnant women and is characterized by high blood pressure and high protein levels in the urine. It is a serious hypertension condition linked with increased maternal morbidity and mortality⁶. Pre-eclampsia can progress to eclampsia, a life-threatening illness that causes convulsions during pregnancy, if left untreated. Pre-eclampsia is associated with a variety of severe consequences on the mother and foetus and affects 2-8% of pregnancies globally. Although it can develop beyond 20 weeks of pregnancy, it happens most commonly after week 32. Many earlier investigations have proven its link with maternal obesity^{8,9}. Compared to healthy women, obese women have a greater incidence of pre-eclampsia (30.9% vs. 14.5%), eclampsia (21.8% vs. 7.3%), and gestational diabetes (27.3% vs. 9.1%).

According to ERUM JAHAN et al, the prevalence of preeclampsia was substantially greater among obese pregnant women than among non-obesity controls (34.14 percent against 17.07 percent). Obesity was substantially related with a greater incidence of eclampsia (26.82% vs. 12.19%) and gestational diabetes (31.70% vs. 17.07%) compared to those with a healthy body mass index¹¹. The purpose of the study was to assess the prevalence of pre-eclampsia between obese and non-obese primigravida in the local community. The data might subsequently be utilised to enhance public awareness about this crucial public health concern among women of reproductive age and their treating physicians in order to improve outcomes in all key areas.

MATERIAL AND METHODS

A prospective cohort study was conducted between 1 June 2021 and 31 December 2021 at the Department of Gynecology and Obstetrics, Bahawal Victoria Hospital, Bahawalpur. A total of sixty (60) primigravida patients between age around 20 and 35 years with singleton pregnancies of >26 weeks, and without placenta previa, gestations, known diabetes, hypertension, or unwilling patients were selected via non-probability consecutive sampling. The sample size for the study was determined using a level of significance of 5% and a power of 80%, with a sample size of 30 for each group. Participants provided written informed consent after ethical committee approval, and a senior gynecologist was available to provide detailed information to both patients and researchers.

Every patient's body mass index was calculated using the formula BMI=weight in kilograms/height in metres squared, and a 24-hour sample of urine was collected to detect proteinuria. In Group A (obese primigravida with BMI >30kg/m²) and Group B (non-obese primigravida with BMI 30kg/m²) were the two main patient groups. All patients were monitored until delivery, and pre-eclampsia incidence was recorded. Pre-eclampsia was defined as (SPB)systolic blood pressure >140mmHg (measured twice at least

six hours apart) and proteinuria, defined as 300mg of proteins in a 24-hour urine sample.

The collected data were recorded on a specially designed Performa, and SPSS version 16 was used for statistical analysis. For quantitative variables such as age (in years), gestational age (in weeks), and BMI, the mean and standard deviation were presented, while frequency and percentage were calculated for qualitative variables such as pre-eclampsia (present/absent). The frequency of pre-eclampsia was compared using Chi-square, and a P-value 0.05 was considered significant. To determine the association between pre-eclampsia and obesity, the relative risk was calculated, and RR>1 was considered significant. Effect modifiers such as age, gestational age, and BMI were measured via stratified, and post-stratification chi-square was used to determine their impact on the outcome; a P-value 0.05 was deemed significant.

RESULTS

This study's participants ranged in age from 20 to 35 years old, with a mean age of 27.08 3.59 years. The average length of pregnancy was 34.65 4.35 weeks. Group A had a mean gestational age of 34.50 4.33 weeks, whereas Group B had a mean gestational age of 34.80 4.33 weeks. The majority of patients, 29 of 60 (48.33%), were older than 36 weeks gestation. The mean BMI for Group A was 37.50 5.47 kg/m², while the mean BMI for Group B was 26.77 3.64 kg/m². Group A (obesity primigravida) had a frequency of preeclampsia of 43.33%, whereas Group B (non-obese primigravida) had a frequency of 13.33%. Table 2 displays a P-value of 0.010 and a relative risk of 2.75, demonstrating a statistically significant positive correlation between obesity and preeclampsia. Age, age of gestations and BMI stratification in relation to preeclampsia is depicted in Tables 2, 3, 4, and 5.

Table 1: BMI in both groups (n=60)

BMI(kg/m ²)	Group A		Group B		Total	
	N	%	N	%	N	%
<20			06	20.0	06	10.0
20-30			24	80.0	24	40.0
>30-40	17	56.67%			17	28.33
>40	13	43.33%			13	21.67
Mean +SD	37.50+5.47		26.77+ 3.64		30.50+8.35	

Table 2: %age of patients according to preeclampsia between both Groups.

		Group A		Group B	
		N	%	N	%
preeclampsia	yes	13	43.33	04	13.33
	NO	17	56.67	26	86.67

- P value is 0.010 which is statically significant.
- Relative risk is 2.75 which is considered significant.

Table 3: stratification of age group with respect to Preeclampsia

Age (years)	Group A		Group B		P-value
	preeclampsia		preeclampsia		
	yes	no	yes	no	
20-25	03(37.5%)	05(62.5%)	01(14.29%)	06(85.71%)	0.310
26-30	07(43.75%)	09(56.25%)	01(6.67%)	14(93.33%)	0.018
31-35	03(50.0%)	03(50.0%)	02(25.0%)	06(75.0%)	0.334

Table 4: stratification of gestational age with respect to preeclampsia:

Gestational age	Group A		Group B		P-value
	preeclampsia		preeclampsia		
	yes	no	yes	no	
26-30weeks	02(28.57%)	05 (71.43%)	00 (0.0%)	07 (100.0%)	0.127
31-35 weeks	03(33.33%)	06 (66.67%)	01 (12.5%)	07 (87.5%)	0.312
>36 weeks	08(57.14%)	06 (42.86%)	03 (20.0%)	12 (80.0%)	0.039

Table 5: stratification of BMI with respect to preeclampsia:

BMI(Kg/m ²)	Group A		Group B		P-value
	preeclampsia		preeclampsia		
	Yes	no	yes	no	
<20			01(16.67%)	05(83.33%)	0.788
20-30			03(12.5%)	21(87.5%)	

>30-40	04(23.53%)	13(76.47%)	0.012
>40	09(69.23%)	04(30.77%)	

DISCUSSION

Being obese or overweight increases the risk of developing all types of preeclampsia, including severe and moderate forms, as well as those that occur early and late in pregnancy. Obesity is associated with an increased risk of preeclampsia, according to studies undertaken in many cultures throughout the world^{12,13}, demonstrating that this is not an exclusively Western problem. Notably, the risk of preeclampsia is not exclusive to obese and overweight women; a higher body mass index within the normal range is also associated with an increased risk. These results corroborate the theory that fat mass plays a crucial role, and weight loss has been found to reduce the risk of preeclampsia^{14,15}.

Preeclampsia is more prevalent in obese primigravida than in non-obese primigravida, according to the current study. Preeclampsia was more prevalent in the obese primigravida group (43.33%) than in the non-obese primigravida group (13.33%). Obesity is significantly associated with preeclampsia, as indicated by the P-value of 0.010 and the relative risk of 2.75. According to Gunatilake et al.¹⁶, obese pregnant women are at a greater risk for unfavourable maternal-fetal outcomes during the antepartum, intrapartum, intraoperative, postoperative, and postpartum periods than their counterparts of optimal bodyweight. Taoudi F et al.¹⁷ discovered that the prevalence of gestational diabetes, anaemia, and toxemia of pregnancy was considerably higher in the obese group than in the normal group (p 0.001). In addition, their research revealed that obesity during pregnancy is connected with increased risks of maternal and newborn problems. Santos S. et al. (18) hypothesised that 23.9% of all pregnancy complications were linked to maternal overweight or obesity.

Jeyabalan¹⁹ A emphasized that the alarmingly rising incidence of obesity is a risk factor not just for preeclampsia but also for cardiovascular disease in later life. In a research conducted by Jahooran Mariyah et al.²⁰, it was discovered that the incidence of preeclampsia was substantially higher among overweight and obese women than among women of normal weight. 26.2% of the obese participants in their research were confirmed with pre-eclampsia. There is a relationship between obesity and an increased risk of maternal and foetal problems. Miao M. and colleagues²¹ found that maternal excess weight is related with gestational diabetes, preeclampsia, and an increased likelihood of caesarean delivery. Our research revealed a clear correlation between a person's body mass index (BMI) and preeclampsia, with the incidence of preeclampsia increasing as BMI rises. It is essential to increase public knowledge of this critical public health issue among women of reproductive age and treating doctors in order to improve results in all aspects and reduce adverse maternal and perinatal outcomes or complications.

CONCLUSION

The frequency of preeclampsia is much greater in obese primigravida women than in those who are not fat, according to the findings of this study. The study indicated that 43.33 percent of obese primigravida women got preeclampsia, compared to 13.33 percent of non-obese primigravida women. The research also found a correlation between body mass index and preeclampsia. On the basis of these findings, it is suggested that local and national public awareness campaigns be created to educate women of reproductive age about the hazards connected with obesity and preeclampsia. Informing doctors who treat pregnant women about the increased risk of unfavourable maternal and perinatal outcomes linked with obesity and preeclampsia is also essential. By increasing knowledge of these factors, we can reduce the incidence of preeclampsia and improve outcomes for both mothers and infants.

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