Original Article

Obesity as a Predictor of Preeclampsia in Pregnant Women at a Tertiary Care Hospital

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ABSTRACT

Objective: To determine maternaloutcomes of pregnancy among women having increased body mass index.
Study Design: Descriptive / cross sectional study
Place and Duration of Study: This study was conducted at the Department of Gynecology and Obstetrics, Nishtar Hospital, Multan from March 2016 to March 2017.
Materials and Methods: A total of 150 women fulfilling inclusion and exclusion criteria of the study were enrolled in this research study. Informed consent for the participation was taken from each patient. All the relevant information and data were noted on pre-designed proforma. Data were entered and analyzed using SPSS-17.
Results: A total of 150 pregnant ladies were enrolled in this study. Mean ages of these study cases were 30.47 ± 4.18 years. Mean parity of these study cases was 3.31 ± 1.15. Mean. BMI values of these study cases were 30.17 ± 2.91 Kg/m^2. Maximum no. of study cases were from age groups 25-35 years i.e. 115 (76.66%). Frequency of preterm births was 50 (33.33 %). Majority of our study cases i.e. 95 (63.3%) had BMI in the range of 27.5-30 Kg/m^2.Very high frequencies 65 (43.3%) of pre-eclampsia were observed.
Conclusion: Our study results have indicated that obesity in pregnant women is linked to an increased risk of gestational diabetes, PPH, higher rates of c. section deliveries and pre-eclampsia. Obesity is significantly related with complications related to the mother and fetus. Well directed interventions regarding weight loss and avoidance to excessive weight gains during pregnancy prior to pre-conception period.
Key Words: BMI, Pre-eclampsia, Gestational diabetes, Parity.

INTRODUCTION

Obesity is a medical condition in which excess body fats accumulates to the extent that it may have an adverse effect on the body. Obesity is a growing global health problem and has become worldwide epidemic. WHO defines obesity as Body mass index (BMI) of more than 30[1]. Worldwide obesity exists at a prevalence of 15-20% and accounts for 2-7% of total healthcare cost.[2] A study in PIMS Pakistan showed that more women are obese than men and are more susceptible to complications. The increasing prevalence of maternal obesity worldwide provides a major challenge to obstetric practice.[3] Maternal weight status both before and during pregnancy is an important determinant of birth outcome. Pre-pregnancy weight has been shown to be a significant determinant of birth weight in both industrialized and developing countries.

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Similarly, the independent effect of the gestational weight gain has been well correlated. Maternal obesity has been reported as a risk factor for various antenatal, intrapartum, postpartum and neonatal complications such as postdates, induction of labour, macrosomia, shoulder dystocia, prolonged duration of labour, increased blood loss, caesarean section rates and neonatal admissions. Obesity in pregnancy has a particular set of complications. Maternal obesity increases the risk of congenital malformations[4-5] Athukorala*et al.* reported in their study that frequency of pre-eclampsia was 11.4% and cesarean section was 36.4%.[6]Obese women are at greater risk of developing gestational diabetes mellitus and in one study it has been reported as 21.1%, cesarean section as 60.6%.[7] and hence the risk of large for gestational age infants is increased up to 1.4 to 1.8 folds than in lean mothers.[8, 9] Delivery in obese women leads to high cesarean section rate and increased risk of anesthetic and post-operative complications.[10]A study published from UK reported 18% cesarean section surgeries among obese women.[11]A study conducted in Australia to assess the prevalence and impact of obesity showed that hypertensive disorders of pregnancy and gestational diabetes as well as increased neonatal morbidity is more common in obese women.[12]A study conducted in Liaqaut National Hospital Karachi concluded that

obesity is associated with higher cesarean section rate i.e. 39.8%.[13] Another case control study conducted in Sultan welfare Hospital Karachi reported that post partum hemorrhage occurred in 45% of obese women[14]. Obesity is becoming a serious challenge to health services mostly because of life style modifications, less exercise, sedentary life, and high cholesterol diet. It has a more serious impact on pregnancy outcomes but no such study has been conducted in our population which could document pregnancy outcomes among obese women of this region. The purpose of this study was to understand the consequences of obesity on maternal morbidity and mortality so that a multi-disciplinary approach could be acquired and a management plan could be established starting from pre-pregnancy up to puerperium.

MATERIALS AND METHODS

A specialized proforma was developed to record findings of this study. Females visiting gynecology outpatient department Nishtar hospital Multan fulfilling inclusion and exclusion criteria with BMI >27.5kg/m^2 were enrolled in the study while known hypertensive patients, known cases of diabetes mellitus, placenta preavia, those having history of recurrent miscarriages and previous uterine scars were excluded from our study. Patients were included in this study after taking informed consent, the demographic information like name, age and address were obtained. 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 defined as; Blood pressure more than 140/90mmHg with proteinuria >300mg/dl after 20 weeks of gestation)was noted in the Performa by the researcher. Data was entered and analyzed by using SPSS version 17. Descriptive statistics was used to calculate mean and standard deviation for age and gestational age of the patients. Frequencies and percentages were calculated for outcome variables i.e. pre-eclampsia, gestational diabetes mellitus and post-partum haemorrhage and impact of confounders was ascertained by applying chi – square test at level of significance of 0.05.

RESULTS

A total of 150 pregnant ladies meeting inclusion criteria were enrolled in this study. Mean ages of these study cases were 30.47 ± 4.18 years (minimum 22 years while maximum 39 years of age). Mean gestational ages of these study cases were 35.63 ± 3.91 weeks (minimum 27 while maximum 39 weeks of gestation). Mean parity of these study cases was 3.31 ± 1.15 (minimum parity was 1 to maximum parity was 7). Mean BMI values of these study cases were 30.17 ± 2.91 Kg/m^2 (minimum BMI was 27.5 while maximum was 35.2 Kg/m^2).The study results have indicated that

maximum no. of study cases were from age groups 25-35 years i.e. 115 (76.66%). Frequency of preterm births was high in our study cases as 50 (33.33 %) of these ladies completed gestation before 36 weeks of gestation. Majority of the study cases i.e. 98 (65.33%) had parity between 1-3 while only 8 (5.3%) had parity more than 6. Majority of our study cases i.e. 95 (63.3%) had BMI in the range of 27.5-30 Kg/m^2 while none of our study cases presented with BMI more than 35.2 Kg/m^2. Very high frequencies 65 (43.3%) of pre-eclampsia were observed in our study cases while gestational diabetes mellitus was seen in 32 (21.3 %) of the study cases and post partum haemorrhage was noted in 70 (46.7%). Pre-eclampsia was stratified with regards to age, gestational age and parity and it was observed that p-valueswere 0.001, 0.796 and 0.905.

Table No. 1: Stratification of pre-eclampsia in different age groups

Age groups (In years)	Pre-eclampsia		P-value
	Yes (n=65)	**No** (n=85)	
21-25 (n=20)	5	15	
26-30 (n=50)	30	20	
31-35 (n=65)	20	45	
36-39 (n=15)	10	5	0.001

Table No. 2: Stratification of pre-eclampsia with respect to gestational age. (n=150)

Gestational ages (In weeks)	Pre-eclampsia		P-value
	Yes (n=65)	**No** (n=85)	
25-30 (n=26)	11	15	
31-36 (n=24)	9	15	
37 and above (n=100)	45	55	0.796

Table No. 3: Stratification of pre-eclampsia with respect to parity. (n=150)

Parity	Pre-eclampsia		P-value
	Yes (n=65)	**No** (n=85)	
1-3 (n=98)	42	56	
4-6 (n=44)	20	24	
More than 6 (n=8)	3	5	0.905

Table No. 4: Stratification of pre-eclampsia with respect to BMI. (n=150)

BMI (kg/m^2)	Pre-eclampsia		P-value
	Yes (n=65)	**No** (n=85)	
Less than 30 (n=95)	50	45	
31-35 (n=55)	15	40	0.003

DISCUSSION

Obesity remains major contributor towards increased morbidity and mortality from different conditions such as those of heart diseases, diabetes mellitus and cancer.

During pregnancy obesity is stronglyco-related with higher risks of pre-eclampsia, preterm births, gestational diabetes and cesarean delivery[15-20]. A total of 150 obese pregnant ladies meeting inclusion criteria were enrolled in this study. Mean ages of these study cases were 30.47 ± 4.18 years (ranging; 22 years to 39 years). The study results have indicated that maximum no. of study cases were from age groups 25-35 years i.e. 115 (76.66%). Parveen et al[21] reported 26.64 ± 4.52 years mean age of the obese pregnant women, close to our results. Endeshaw et al[22] from Ethiopia reported 28.14 ± 6.3 years mean age of the obese women being followed for development of preeclampsia, close to our findings. Mean gestational ages of these study cases were 35.63 ± 3.91 weeks (minimum 27 while maximum 39 weeks of gestation). Parveen et al[21] reported 33.09 ± 3.72 weeks gestational age, close to our results. Mean parity of these study cases was 3.31 ± 1.15 (minimum parity was 1 to maximum parity was 7).Majority of the study cases i.e. 98 (65.33%) had parity between 1-3 while only 8 (5.3%) had parity more than 6. Parveen et al[21] reported similar results.

Mean BMI values of these study cases were 30.17 ± 2.91 Kg/m^2 (minimum BMI was 27.5 while maximum was 35.2 Kg/m^2). Majority of our study cases i.e. 95 (63.3%) had BMI in the range of 27.5-30 Kg/m^2 while none of our study cases presented with BMI more than 35.2 Kg/m^2. A study conducted by Parveen et al[21] reproted 31.74 ± 1.01kg/m^2 mean BMI of the obese pregnant women which is similar to our results. Endeshaw et al[22] from Ethiopia also reported similar results.

Pre-eclampsia was observed in 65 (43.3%) of our study cases, a study conducted in Karachi by Jaleel et al reported 30.3% preeclampsia[17]. Another study conducted by Ali et al at Karachi reported 23.3 % pre-eclampsia among obese pregnant women. Ahmed et al from Egypt reported 32.4% preeclampsia among obese pregnant ladies [18]. Frequency of pre-eclampsia in both studies conducted at Karachi was lower than that of our study results[19]. A study conducted in Saudi Arabia reported by 15.3% frequency of pre-eclampsia among obese pregnant women[20] while Athukorala et al reported 11.4% preeclampsia among obese women[6]. Parveen et al[21] also reported lower values of 23.8% preeclampsia in obese pregnant women. Endeshaw et al.[22] from Ethiopia also reported 34 % preeclampsia, close to our results. A study conducted in Australia reported 34% rate of pre-eclampsia among obese women[23]. Preeclampsia has been reported to be 30% associated with obesity related pregnancies in USA[24.]

CONCLUSION

Our study results have indicated that obesity in pregnant women is linked to an increased risk of gestational diabetes, PPH, higher rates of c. section deliveries and pre-eclampsia. Obesity is significantly related with complications related to the mother and fetus. Well directed interventions regarding weight loss and avoidance to excessive weight gains during pregnancy prior to pre-conception period. The gynecologists and other healthcare providers must inform their obese patients regarding complications and risks posed by obesity and should counsel the merits of weight loss. Not only in pregnancy, obesity can lead to the certain health issues for the mother (heart diseases and hypertension) and baby (heart diseases and obesity) in later times of their life. Such complications are also linked to the higher investments both by family and health authorities which is an additional burden in our societies like ours. With the management of obesity before conception, we can significantly decrease our economic investments as well.

Author's Contribution:

Concept & Design of Study:	Hina Mukhtar
Drafting:	Marjan Batool
Data Analysis:	Marjan Batool & Sehrish Javed
Revisiting Critically:	Marjan Batool & Hina Mukhtar
Final Approval of version:	Hina Mukhtar & Marjan Batool

Conflict of Interest: The study has no conflict of interest to declare by any author.

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