Recurrent Miscarriages In Patients With High Body Mass Index

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ABSTRACT

Objective
To assess the frequency of recurrent miscarriages in patients with raised body mass index (BMI).

Study design
Cross sectional study.

Place & Duration of study
Department of Obstetrics and Gynecology, Jinnah Postgraduate Medical Center (JPMC) Karachi, from August 2021 to February 2022.

Methods
Women with two or more miscarriages with BMI >25kg/m^2 were enrolled by non-probability consecutive sampling method. The weight and height were measured with a standard method in kilogram and centimeters respectively. BMI was then calculated with the metric system, using the formula; weight in kilograms divided by height in meters squared. BMI was reported as kg/m^2. Data were collected on a pre designed form and entered into SPSS 20. Data stratification were done and Chi square test was applied post-stratification. A p <0.05 was taken as significant.

Results
A total of 137 women were enrolled. The age of the patients was between 25 years - 45 years. The mean age of the patients was 31.14±6.49 years. The mean BMI was 29.41±2.56 kg/m^2. Forty-nine (35.8%) were mothers of less than three children. Sixty-five (47.4%) were working women. Seven (5.1%) women were not formally educated. Out of the total, 23 (16.8%) women with increased BMI had recurrent miscarriages. There were 46 (33.6%) patients from 25 years - 35 years of age group. Seventy-two (52.6%) women were in multipara group and 65 (47.4%) in primipara group. Twelve (52.2%) patients who had recurrent miscarriages were in the age group of 25 years - 35 years and 11 (47.8%) were from 37 years - 45 years age group. This was found significant (p=0.03).

Conclusion
Increased frequency of recurrent pregnancy loss was observed in women with high BMI. This was an adverse pregnancy outcome that can be addressed with counseling and optimization of weight by diet coupled with exercises.

Key words
Obesity, Recurrent pregnancy loss, BMI, Pregnancy, Miscarriages.

INTRODUCTION:

The definition of the term recurrent pregnancy loss (RPL) is not agreed upon. In many studies two or more consecutive loss of pregnancies before the age of viability is defined as recurrent miscarriages. Miscarriage or abortion is the loss of pregnancy prior to the age of 20 completed weeks gestation (or 18 weeks post fertilization), or if the age of gestation is not known, the loss of fetus/embryo of approximately 400gm weight.[1] Recurrent pregnancy loss is an important reproductive health issue as it affects around 2% -5% of the couples. Frequency of RPL tends to vary extensively among studies due to the difference in its definition as well as criterion and

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varying degrees of characteristics amongst the population.[2-4] Tertiary RPL is referred to as multiple loss of pregnancies with normal pregnancies in between.[5]

The major cause of miscarriage is genetic in origin. It is a distressful event for a woman and her family.[6] Studies have shown that obesity in mother can be linked to a high risk of miscarriages whether spontaneous or through assisted conception.[7] Incidence of obesity has increased significantly in the past 30 years. Studies suggest that most of the adults living in the industrialized countries are either overweight or obese.[8-10] It is still uncertain if the higher risk of miscarriages is associated with obesity or to the embryo produced by poor quality oocyte, impaired uterine function or a combination of all.[11] Around 70% of miscarriages are related to the lethal numerical chromosomal errors. However, there is still no agreement on the fetal genetic aberrations as a primary factor causing an increased risk of miscarriages amongst the obese women.[12] Obesity has a grave implication on the maternal health like depression due to recurrent pregnancy loss and other health related problems including hypertension, diabetes mellitus and preeclampsia. This study was conducted to document the association between miscarriages and high BMI. This could help in counseling with the women for future pregnancies.

METHODS:

Study design, place & duration: This was a cross sectional study conducted in the Department of Obstetrics and Gynecology, Jinnah Postgraduate Medical Center Karachi, from August 2021 to February 2022.

Ethical considerations: The study was approved by the Institution Review Board letter No.F.2-81/2020-50282/JPMC dated 05-12-2020 and informed consent was taken from the study participants.

Inclusion criteria: Women of reproductive age with the history of more than two miscarriages and BMI more than 25 kg/m^2 were included.

Exclusion criteria: All women with hypertension, diabetes mellitus, cervical insufficiency and coagulation disorders were excluded.

Sample size estimation: Sample size calculated by using the percentage frequency of outcome variable (recurrent miscarriages or number of previous miscarriages) to be 15% with confidence interval and 6% decision, the minimum required sample size was calculated to be 137 by using the formula $n = z^2 p (1-p)/d^2$

Sampling technique: Non probability sampling method was used.

Study protocol: The weight of the patients was measured in kilograms and height in centimeters. BMI was defined as weight in kilogram (measured on weighing machine) divided by the square of height in meter (kg/m^2) measured by standard meter. The WHO definition was used as BMI > 25 kg/m^2 as overweight and BMI> 30 kg/m^2 as obese. Data were recorded on a pre-designed form.

Statistical analysis: Data were entered into SPSS version 20. Frequencies and percentages were calculated for the categorical variables (occupation, recurrent miscarriages and educational status), while mean and standard deviation were reported for the continuous variables (BMI, gravidity, parity and number of previous miscarriages). Normality of data distribution was checked by Shapiro-Wilk test. Effect modifiers like age, gravida, para, occupational status, education level were controlled through stratification. Post-stratification Chi-square test was applied and a p value of < 0.05 was considered as significant.

RESULTS:

A total of 137 women were included. The age of the patients was from 25 years to 45 years. The mean age of the women was 31.14±6.49 years. The mean BMI was 29.42±2.56 kg/m^2 while minimum BMI was 26 kg/m^2 and maximum was 32 kg/m^2. Out of the total, 23 (16.8%) women had recurrent miscarriages. There were 46 (33.6%) patients from 25 years - 35 years of age group. Seventy-two (52.6%) women were in multipara group and 65 (47.4%) in primipara group. Forty-nine (35.8%) were the mothers of less than three children. Sixty-five (47.4%) were working women. Seven (5.1%) were not formally educated, 13 (9.5%) had primary, 49 (35.8%) secondary and 68 (49.6%) received higher education.

Twelve (52.2%) patients who had recurrent miscarriages were in the age group of 25 years - 35 years and 11 (47.8%) were from 37 years - 45 years age group. This was found significant (p=0.03). Thirteen (56.5%) primipara group women had recurrent miscarriages. Ten (43.5%) women in the multipara group had recurrent miscarriages. Patients who were less than three gravida, 06 (26.1%) had recurrent miscarriages whereas, patients who were > 3 gravida 17 (73.9%) had recurrent miscarriages. Details are given in table I.

Table I: Recurrent Miscarriages According To The Demographic Variables

Variables		Recurrent Miscarriages		P- Value
		Yes	No	
Age (years)	25 - 35	12 (52.2%)	34 (29.8%)	0.03*
	36 - 45	11 (47.8%)	80 (70.2%)	
Parity	Primipara	13 (56.5%)	52 (70.2%)	0.23
	Multipara	10 (43.5%)	62 (54.4%)	
Gravida	< 3	06 (26.1%)	43 (37.7%)	0.20
	> 3	17 (73.9%)	71 (62.3%)	
Occupational Status	Employed	14 (60.9%)	51 (44.7%)	0.11
	Unemployed	09 (39.1%)	63 (55.3%)	
Educational Status	Not formally educated	01 (4.3%)	06 (5.3%)	
	Primary Level	01 (4.3%)	12 (10.5%)	0.63
	Secondary Level	07 (30.4%)	42 (36.8%)	
	Higher Level	14 (60.9%)	54 (47.4%)	

*Significant

DISCUSSION:

Recurrent pregnancy loss can lead to physical and emotional problems for the couple. Despite the advances in research on the subject of miscarriages many controversies exist and are debated. This indicates the need of further research on the subject. In the current study different variables were analyzed that may be associated with the miscarriages. Factors related to the life style like consuming unhealthy diet, lack of physical activity due to sedentary living, and increase dependence on technology rather than manual work, lead to weight gain. This may result in unfavorable reproductive environment with impaired implantation of embryo and compromised progress of pregnancy.

According to the study done by Lo et al in cases of idiopathic recurrent pregnancy loss the miscarriages risk was significantly increased in women with BMI > 30kg /m^2. Furthermore, while comparing Asian and Caucasian women with similar BMI, Asian women were more at a risk of having further miscarriages. The study also concluded that in half of the couples with recurrent miscarriages the cause was not known.[13]

In another study done, 53% of the miscarriages were found in women of 45 years and above and 10% were observed in the age group of 25 to 29 years.[14] The study conducted by Utami et al reported that high BMI and recurrent pregnancy loss had significant correlation.[15] WHO set the cutoff point of BMI for overweight and obesity of Asian and European population which is different. For the European population the BMI value for overweight is more than 25 kg/m^2 and for Asian population it is greater than 23.5 kg/m^2 and for obesity the BMI value is greater than 27 kg/m^2.[15]

Limitations of the study: This is a single center study with small number of women. In this study BMI cutoff values used were related to that used for European women.

CONCLUSION:

Women with raised BMI are at high risk of having recurrent miscarriages. Optimization of weight before the conception with diet and exercises, may result in better pregnancy outcome.

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Authors' contributions:
Nasreen Fatima: Data analysis and interpretation of results, manuscript drafting & revision, final approval & agreement to be accountable of the content of the study.
Jatika Kumari: Conception, study design, data acquisition, analysis and interpretation of results, manuscript drafting & revision, final approval & agreement to be accountable of the content.

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