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Original Article

Determine the Obesity as a Risk Factor for Gestational Diabetes Mellitus and Gestational Hypertension as Compared to Non-Obese Patients

Samreen Riaz[1], Saleha Ijaz[2], Hina Zafar[2], Sameena Gardezi[2], Sidra Fareed[1] and [3]Hafiza Sobia Ramzan
[1]Kot Khawaja Saeed Hospital, [2]Lady Aitchison Hospital, [3]Institute of Molecular Biology and Biotechnoloy, University of Lahore

ABSTRACT
Introduction: Obesity has been recognized by the World Health Organization as a pandemic nutritional disorder which represents a rapidly growing threat to the health of populations of an increasing number of countries worldwide.
Objectives: The objective was to determine the obesity as a risk factor for Gestational Diabetes Mellitus and Gestational Hypertension when compared with non-obese patients. **Material & methods:** A cohort study in which comparison of obese patients versus non-obese patients for developing gestational *d*iabetes *m*ellitus and gestational hypertension was done during November 2019 to October 2020. **R*esults:*** The results of the current study reveals *that* mean *BMI* was as 27.86±4.21 in Group-1 and 26.33±3.87 years in *Group-2.* Comparison of risk factors (gestational diabetes mellitus) in both groups was done which reveals 15.33% (n=23) in Group-1 and 3.33% (n=6) in Group-2, relative risk shows 3.83, which is significant. **Conclusions:** The frequency of maternal complications is higher among obese pregnant females as *compared* to normal weight females.
KEY WORDS: BMI, Gestational, Pregnancy, Diabetes

Introduction

Obesity is a growing global health problem.[1] Although it has been better studied in developed countries, obesity is now becoming a problem in developing countries as well. There are many reasons for advocating weight loss in overweight and obese women who are planning to become pregnant.[2] Maternal obesity is associated with increased risk of adverse pregnancy out come during antepartum, intra-partum and post-partum period.[3] These complications include gestational diabetes mellitus, pregnancy induced hypertension, slow progress of labour,[1]increased rate of cesarean section,[6-9]deliveries of large for date babies and post-partum hemorrhage. According to a study the incidence of gestational hypertension in obese patients was 32.4% versus non obese i.e. 3.7% (RR=8.74). Similarly the incidence of gestational diabetes mellitus was also high in obese patients i.e.11.8% as compared to non-obese i.e. 1.9% (RR=6.75).[10]

CORRESPONDENCE AUTHOR
Dr. Samreen Riaz
Kot Khawaja Saeed Hospital

For these reasons all obese women are referred for evaluation of pregnancy and planning of labour and delivery by an anaesthetist, obstetrician and a physician. According to the World Health Organization (WHO), overweight and obesity are defined as "abnormal or excessive fat accumulation that presents a risk to health." Obesity is an excess proportion of total body fat. A person is considered obese when his or her weight is 20% or more above normal weight. The most common measure of obesity is the body mass index or BMI. A person is considered overweight if his or her BMI is between 25 and 29.9; a person is considered obese if his or her BMI is over 30.[11]

Objectives

The objective was to determine the obesity as a risk factor for gestational diabetes mellitus and gestational hypertension when compared with non-obese patients.

Material and methods

A cohort study in which comparison of obese patients versus non-obese patients for developing gestational Diabetes mellitus and gestational hypertension was done during November 2019 to October 2020. Study was conducted in Lady Aitchison Hospital, outpatient

Deptt. Lahore. The Data was collected through non-probability consecutive sampling technique.

Sample Size

A Sample size of 300 cases (150 in each group) is calculated with 80% power of test, 1% level of significance and taking expected percentage of gestational diabetes mellitus (least among both) in both groups i.e. 11.8% in obese group and 1.9% in non-obese group Moreover it is difficult to assess fetal presentation and fetal growth in the conventional way i.e. by measuring fundal height in obese women. Prevalence of any risk factor for a disease varies from population to population. Much data for my study is available at international level. I want to conduct this study because I have found only one local reference which is insufficient to explain the magnitude of hypertension in our population. It will make us take early interventional steps which would help to reduce the incidence of ante-partum intra-partum and post-partum complications.

Inclusion Criteria

Group 1

- Obese pregnant patients (BMI=30 or >30)

Group 2

- Non-obese pregnant patients (BMI=19.8-24.9)
- Gestational age for both groups = 20 weeks (on dating scan)
- Age for both groups = 20-35 years
- Willing patients

Exclusion criteria:

- Patients having diabetes on 1st antenatal visit or before 20 wks.
- Patients having hypertension on 1st antenatal visit or before 20 wks.

Data Collection Procedure

A total of 300 patients, 150 from obese and 150 from non- obese group visiting outpatient department of LAH fulfilling the inclusion criteria were included in the study. An informed consent was obtained for using their data in research. The study was conducted after clearance from ethical committee. The demographic information like name, age, gravidity, gestational amenorrhea was recorded. BMI was calculated by measuring weight and height of the patients and all of this information was recorded on a proforma (sample attached). An antenatal card was made for each patient on booking visit, patients were followed on OPD basis (every 4 weeks uptill 28 weeks, every 2 to 3 weeks uptill 36 weeks and then weekly until delivery). BP was recorded on each visit. GCT was performed at booking visit, 28 weeks and 36 weeks. If > 140mg/dl then GTT was performed. Data was collected and analyzed by a single researcher to overcome the bias effects, Bias was addressed by having GCT and GTT performed from single lab of LAH.

Data Analysis

Data was analyzed in SPSS version 17. Quantitative variables like age, BMI were presented in the form of mean± SD. Qualitative variables like gestational Diabetes Mellitus and gestational HTN were presented in the form of frequency and percentage. Relative Risk was calculated to see the association between obesity and gestational DM and gestational HTN. Relative Risk greater than 2 was considered as significant.

Results

A total of 300 patients (150 in each group) fulfilling the inclusion/exclusion criteria were enrolled to determine the obesity as a risk factor for gestational diabetes mellitus and gestational hypertension when compared with non-obese patients.

Age distribution of the patients was done in both groups, it shows 22%(n=33) in Group-1 and 28.67%(n=43) in Group- 2 were between 20-25 years, 42.67%(n=64) in Group-1 and 38.67%(n=58) in Group-2 were between 26-30 years, 35.33%(n=53) in Group-1 and 32.66%(n=49) in Group-2 were between 31-35 years of age, mean and SD was calculated as 27.86±4.21 and 26.33±3.87 years respectively.

Comparison of risk factors (gestational hypertension) in both groups was done which reveals 37.33%(n=56) in Group- 1 and 5.33%(n=8) in Group-2, relative risk was calculated as 7.000, which is significant.

TABLE No. 1 COMPARISON OF RISK FACTORS (GESTATIONAL HYPERTENSION) IN BOTH GROUPS (n=300)

Gestational hypertension	Group-1 (n=150)		Group-2 (n=150)	
	No. of patients	%	No. of patients	%
Yes	56	37.33	8	5.33
No	94	62.67	142	94.67
Total	**150**	**100**	**150**	**100**

R.R= 7.000

Comparison of risk factors (gestational diabetes mellitus) in both groups was done which reveals 15.33% (n=23) in Group-1 and 3.33%(n=6) in Group-2, relative risk shows 3.83, which is significant.

TABLE No. 2 COMPARISON OF RISK FACTORS (GESTATIONAL DIABETES MELLTIUS) IN BOTH GROUPS (n=300)

Gestational diabetes mellitus	Group-1 (n=150)		Group-2 (n=150)	
	No. of patients	%	No. of patients	No. of patients
Yes	23	15.33	6	3.33
No	127	84.67	144	96.67
Total	**150**	**100**	**150**	**100**

R.R= 3.83

Discussion

Obesity in pregnancy is associated with increased risk for adverse pregnancy outcome such as gestational diabetes mellitus (GDM), gestational hypertension, preeclampsia and fetal macrosomia etc. The prevalence of any risk factor for a disease varies from population to population, the objective of the current study is well recorded and understood internationally, but national data is found constrained, however, I planned to conduct this study because I found only one local reference which is insufficient to explain the magnitude of HTN in our population. It may make us take early interventional steps which would help to reduce the incidence of ante-partum intra-partum and post-partum complications.

The results of the current study reveal mean and SD was as 27.86±4.21 in Group-1 and 26.33±3.87 years in Group-2, mean and SD of body mass index in both groups was 33.47±2.87 in Group-1 and 22.53±3.21 in Group-2, comparison of risk factors (gestational hypertension) in both groups was done which reveals 37.33%(n=56) in Group-1 and 5.33%(n=8) in Group-2, relative risk was calculated as 7.000, which is significant while comparison of risk factors (gestational diabetes mellitus) reveals 15.33%(n=23) in Group-1 and 3.33%(n=6) in Group-2, relative risk was shown 3.83, which is significant.

These findings are revealed found in agreement with a study showing the incidence of gestational hypertension in obese patients 32.4% versus non obese i.e. 3.7% (RR=8.74) similarly the incidence of gestational diabetes mellitus was also high in obese patients i.e. 11.8% as compared to non-obese i.e. 1.9% (RR=6.75).[10]

Conclusion

The frequency of maternal complications is higher among obese pregnant females as compared to normal weight females. So, it is recommended that every pregnant female who presents with increased BMI, should be sorted out for maternal complications. However, it is also required that every setup should have its surveillance in order to know the frequency of the problem

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CONTRIBUTION OF AUTHORS	
Author	**Contribution**
Samreen Riaz	A,B,C
Saleha Ijaz	A,B,C
Hina Zafar	A,B,C
Sameena Gardezi	B,C
Sidra Fareed	B,C
Hafiza Sobia Ramzan	B, C

KEY FOR CONTRIBUTION OF AUTHORS:

A. Conception/Study/Designing/Planning
B. Active Participation in Active Methodology
C. Interpretation/ Analysis and Discussion