Association of Maternal obesity and Preeclampsia with Gestational Diabetes Mellitus (GDM)

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FILE	17429-67672-1-RV.DOC (128.5K)		
TIME SUBMITTED	06-FEB-2017 05:11PM	WORD COUNT	2390
SUBMISSION ID	767144003	CHARACTER COUNT	13150

TITLE:

Association of Maternal obesity and Preeclampsia with Gestational Diabetes Mellitus (GDM)

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ABSTRACT:

BACKGROUND: *GDM is a state of maternal hyperglycemia which is diagnosed merely for the duration of pregnancy and conquers after pregnancy. It results in a variety of maternal and neonatal outcomes like oligohydramnios and Caeserean delivery in mothers at the same time as macrosomia and obesity in children. Women who are obese are at greater risk of mounting Gestational Diabetes Mellitus (GDM) and it is also a risk factor for mounting high blood pressure and protein in the urine following 20 weeks of pregnancy that is preeclampsia. As prevalence of GDM is growing in our population so we want to find its association with maternal obesity and preeclampsia.*

OBJECTIVE: *The main objective of the study is to evaluate the obesity level/BMI in GDM as compare to non GDM mothers and also to calculate the association of Preeclampsia both in GDM and non GDM mothers.*

METHODOLOGY: *It was a comparative cross sectional survey conducted in Pakistan Railway general hospital Rawalpindi from February 2015 to April 2015. A total of 60 gestational women between the ages of 18 to 38 years were divided into 2 groups, one group was having GDM mothers while other group consisted of non GDM mothers. Women included in the study have gestational age more than 20 weeks. Informed consent was taken from the patient. Patient's name and particulars were recorded. Initial valuation of the patient by history and clinical examination was performed and recorded in the performed data collection sheet. Data was collected through Urine RE samples for Preeclampsia and BMI testing done for determination of obesity and data was analyzed by using SPSS Vs 20.*

RESULTS: *In GDM mothers group 5 out of 30 (16.6%) were in the normal weight range, 16 (53.3%) found to be overweight while 9 (30%) were obese according to BMI table and no woman was found to be under weight. In the second group of non GDM, 18 mothers (60%) had a normal weight while 6 (20%) were overweight and 6 (20%) were obese. Hence there are more over weight patients with gestational diabetes but we also found obesity in mothers without GDM. On the other hand 5 out of 30 mothers (16.66%) with GDM had Preeclapmsia while in mothers without GDM, 3 (10%) out of 30 had positive preeclampsia*

CONCLUSION: *It is concluded that obese mothers are more at risk of developing GDM as compare to mothers who have normal BMI/body weight and we also found that Preeclampsia has less association with GDM. It is also prevalent in women without GDM*

13

KEY WORDS: *Gestational diabetes Mellitus, Maternal obesity, Preeclampsia, Body Mass Index*

INTRODUCTION:

Pregnancy is a worth mentioning risk attribute for new or persistent obesity among women[1] The occurrence of obesity distinct as a body mass index [BMI] of as a minimum 30 kg/m^2 is terrifyingly high, having reached 33.8% among US adults in 2008[2].Statistics from the United States (US) National Longitudinal Survey of Youth viewing that parous women were 3 to 4 times more prone to put up obesity in the 5 years following childbirth compared to women devoid of children followed more than the corresponding time period[3] For that basis, young women are faced with short- and longer-term obesity-associated complications, from hypertension and gestational diabetes mellitus in following pregnancies[4]to diabetes mellitus, chronic cardiovascular disease and untimely premature death[5]

High gestational weight put on are the strongest forecaster of flabby or obesity succeeding pregnancy.[6]Additional expected risk factors, along with sociodemographic individuality and changeable or unstable postpartum behaviors[1]explanation for very modest of the spontaneity and unpredictability in postpartum weight modification. As an attempt in part to reduce the extremely high incidence of obesity among women in the US[7]the Institute of Medicine (IOM) revised gestational weight gain rule in 2009[8]recommend smaller gains for women with higher pre-pregnancy body mass indices (BMI). Even though the fact that, at present less than one-third of pregnant women bring about instruction discretionary gains, with the majority gaining above IOM recommended levels[9]

Higher maternal weight during pregnancy is associated with a number of hostile pregnancy consequences, together with higher incidence of cesarean section, extensive or complicated

vaginal delivery and fetal macrosomia[10] alongside with postpartum weight management in the mothers [11]. Additionally, children born to obese mothers are at advanced risk for being overweight them in later life.[12] As a result, maternal obesity has turned out to be one of the most prevalent, ordinary and preventable risk factors for a complicated pregnancy.

In correspondent with the increase in maternal obesity, population of women with gestational diabetes mellitus (GDM) has enlarged[13]. Numerous presented systematic reviews and meta-analyses have documented a self-governing and strong relationship between obesity and diabetes in pregnancy; compared with normal weight women, obese mothers have more than a threefold larger exposure of developing GDM. [14] Obese mothers are also added anticipated to have higher glucose levels that do not exceed the discontinue for GDM, but up till now present supercilious and lofty risks alike to those joined with GDM.[14] Comparable to obesity, GDM is associated with complications both all through and following pregnancy. Women with GDM have a higher risk of developing hypertensive disorders of pregnancy for example preeclampsia[15] and just about 50% of women with a history of GDM type 2 diabetes mellitus within 5 to 10 years following delivery. [13] Children of mothers with GDM are not only more prone to be macrosomic and have higher body fat at the time of birth, but they are also at distinguished risk in afterward life of flattering overweight and increasing associated complications such as higher blood pressure and type 2 diabetes. [14] Consequently, maternal obesity begets glucose intolerance in pregnancy, which begets additional belongings of obesity and diabetes. [16] Interfering this intergenerational cycle could have enduring damages for maternal and child health.

As pervasiveness of GDM and preeclampsia is rising in our population so we wanted to expose their association with maternal obesity.

MATERIAL AND METHOD:

This comparative cross sectional survey was conducted at Pakistan Railway general hospital Rawalpindi from February 2015 to 20th April 2015. A total of 60 gestational women were enlisted in this study and divide into 2 groups of gestational women each, after their 20 weeks of pregnancy and between the age of 18 to 38 years. One group was having women with GDM and the other have non GDM mothers. Informed consent was taken from the patient. Patient's name and particulars were recorded. Initial valuation of the patient by history and clinical examination was performed and recorded in the performed data collection sheet. Demographic profile and BP, Pulse, HR, temperature and /body weight BMI were noted. Data was collected through Urine RE samples for Preeclampsia and BMI testing done for determination of obesity and data was analyzed by using SPSS Vs 20.

RESULTS:

In GDM group, 5 out of 30 mothers (16.6%) were in the normal weight range, 16 (53.3%) found to be overweight while 9 (30%) were obese according to BMI table and no woman was found to be under weight as shown in table no 01.

In the second group of non GDM, 18mothers (60%) had a normal weight while 6 (20%) were overweight and 6 (20%) were obese. Hence there are more over weight patients with gestational diabetes but we also found obesity in mothers without GDM as shown in table no. 01. (Association of BMI between GDM and Non GDM mothers).Comparison between the percentage of BMI of GDM and Non GDM mothers are shown in figure no 01.

On the other hand 5 out of 30 mothers (16.66%) with GDM had Preeclapmsia while in mothers without GDM, 3 (10%) out of 30 had positive preeclampsia as shown in table no 02. Percentage of association of preeclampsia between GDM and Non GDM mothers has shown in figure no 02. Hence there is no absolute association of preeclampsia with GDM.

DISCUSSION:

Hossainpervaz et al gave a perspective on obesity and diabetes in the developing world in 2007 in which he mentioned that India and China would face greater confront in diabetic epidemics, according to WHO, the number of diabetic people will increase from 84 million to 228 million . Hypertension is five times more in people in diabetes and obesity similarly cardiovascular disease trends.[17]

R. Iqbal et al did a prospective cohort study in south Asian women at Agha khan university hospital Karachi.By measuring BMI he establish that increase body fat percentage (OR 1.07,CI 1.03-1.13) is a risk factor of developing GDM along with physical activity and diet quality.[18]

Meta analysisdone by Chu SY et.al complemented our study that risk of developing GDM is two times higher in overweight, four times in obese and eight times higher in severely obese women when they compared it with normal weight gestational women.[19]

Martin N.Montoro et al compared the insulin resistance in GDM mothers with and without pre eclampsia and found women with preeclampsia were not more insulin resistant in their third trimester and even fifteen months post partum but had higher blood pressure level as compare to non preeclamptic GDM women.[20]

Yogev Yet al aimed to find the rate of preeclampsia with GDM through a retrosecptive study on 1813 GDM patients and diagnosed preeclmpsia in 9.6% of them but we have not found significant association in our study, may be the limitation is our sample size. They establish preeclampsia in obese younger age group women with high nulliparty ratio. They associated it with severity of GDM while we have not assessed the severity of GDM and glycemic profile control hence it should be further investigated with keeping in view the severity level of GDM.[21]

A study by Wiznitzer A et al gave an approach of considering lipid profile in gestational women with GDM and preeclampsia. They exposed abnormal levels of TGs with these complications of pregnancy but they have not given its isolated effects on GDM and preeclampsia. Hence a research gap should be field by comparing the lipid profile changes with or without preeclampsia.[22]

CONCLUSION:

It is concluded that obese mothers are more at risk of developing GDM as compare to mothers who have normal BMI/body weight and we also found that Preeclampsia has less association with GDM. It is also prevalent in women without GDM.

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Table no: 01

Association of BMI between GDM and Non GDM mothers

BMI	*GDM mothers*	*Non GDM mothers*	*P value*
18.5-24.9	*5*	*16*	*< 0.05*
25-29.9	*16*	*6*	*< 0.05*
4	*9*	*6*	*< 0.05*
Total	*30*	*30*	

Figure: 01

Percentage of BMI between GDM and Non GDM mothers

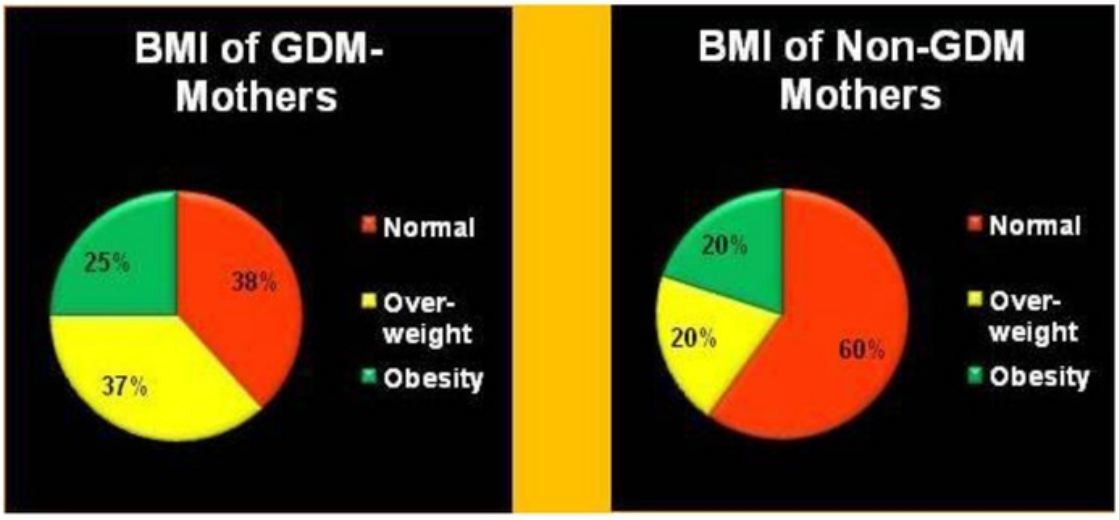
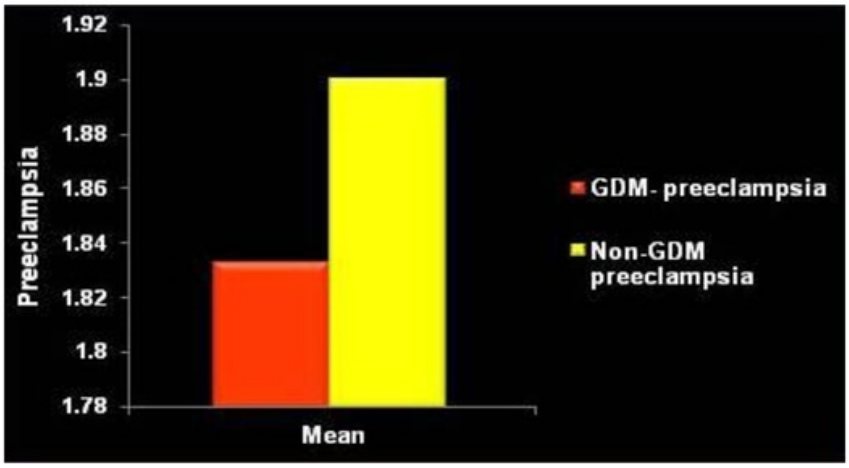


Table: 02

Preeclampsia	*GDM mothers*	*Non GDM mothers*	*p value*
Positive	*5*	*3*	*> 0.05*
Negative	*25*	*27*	*> 0,05*
Total	*30*	*30*	

Figure: 02



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