www.jmscr.igmpublication.org
Impact Factor 5.84
Index Copernicus Value: 83.27
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v5i3.98

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Relationship of Gestational Diabetes Mellitus (GDM) with Overweight and Obese Pregnant: A Tertiary Centre Study

Authors
Dr Rajmani[1], Dr Urvashi[2]
[1]Associate Professor, Department of Medicine, JLN Medical College, Ajmer, Rajsthan
Email: *drrajmani6@gmail.com, Mobile no.: 9829328228*
[2]Assistant Professor, Department of Gynaecology & Obs., SMS Medical College, Jaipur, Rajasthan
Email: *drrajmani6@gmail.com, Mobile no.: 9829328228*

Abstract
Background: *The prevalence of GDM is reported to vary widely from 3.8 to 21% in different parts of India depending on the geographical location. Objectives of this study was to find the relation of GDM with overweight and obesity.*
Material & Methods: *A study on the prevalence and possible risk factors associated with gestational diabetes was undertaken on 100 mothers between the age group of 20 and 35 years; among pregnant women recruited from Gynecology and Obstrectics outpatient of S.M.S Medical College, Jaipur, Rajasthan from January 2016 to January 2017. In this study 100 women were divided in two groups, Group I (n=50) were control group (non gestational diabetic) and Group II (n=50) was study group (gestational diabetic).*
Results: *In present study maximum subjects 35 (70%) seen in control group and 31 (62%) in study group in 25-32 years of age group. The maximum women (n=31) were normal weight (BMI=18.5-24.9 kg/m2) in control group and in study group 27 women were normal weight (BMI=18.5-24.9 kg/m2), followed by 18 women were over-weight (BMI=25-29.9 kg/m2). Body mass index ≥ 25 was significantly higher (p= 0.033*) in cases than controls (44% vs. 22%).*
Conclusion: *Our study showed that overweight and obese women with more than 25 years of age were more prone to develop GDM. We recommend that health authorities strengthen maternal health programs by focusing on the prevention and control of modifiable risk factors during the pre-pregnancy period.*
Keywords: *Gestational diabetes mellitus (GDM), BMI, Pregnant Women, Overweight.*

Introduction

The degree of glucose intolerance of any severity in first time during pregnancy is called Gestational diabetes mellitus (GDM).[1,2] whether insulin therapy or only modify the diet is used for treatment and whether or not the GDM persists after pregnancy. In 2008-2009, the International Association of Diabetes and Pregnancy Study Groups (IADPSG), an international consensus group with representatives from multiple obstetrical and diabetes organizations, including the American Diabetes Association (ADA), recommended that high-risk women found to have diabetes mellitus in first visit in prenatal clinic, using standard criteria, receive a diagnosis of overt, and non gestational diabetes.[3] India have second largest number of subjects having diabetes in the world (62.4 million) and this number is

expected to reach 100 million by the year 2030.[4,5]Modify in lifestyle including unhealthy diet and physical inactivity may have contributed to increased in prevalence of diabetes in general population with a parallel increase in the rates of GDM.[6]

Diabetes is not a major complication of pregnancy. Although prevalence of diabetes is alarmingly high among Indian population there have been very few studies assessing the effect of diabetes on outcomes in pregnancy. Gestational diabetes mellitus (GDM) causes maternal and neonatal complications like stillbirth, hydramnios, etc.

The prevalence of GDM was 3.8 to 21% depending on the geographical location in different parts of India.[7] GDM causes neonatal morbidity and mortality, including macrosomia, shoulder dystocia, other birth injuries, and neonatal hypoglycemia, in addition to congenital anomalies and still births.[8]

Maternal complications occurring in GDM are pregnancy-induced hypertension, maternal infection, fasting hyperglycemia, etc. Complications in preganacy include abortion, preterm labor, hydramnios and unexplained fetal deaths. Fetal complications are fetal macrosomia, fetal malnutrition, neural tube defects and cardiac anomalies like ventricular septal defect, atrial septal defect, etc.[9]The Objectives of this study was to find the relation of GDM with overweight and obesity.

Material & Methods

This is prevalence based study included hundred pregnant women between the age of 20 and 35 years outdoor patients in Gynecology and Obstrectics department in S.M.S Medical College, Jaipur, Rajasthan from January 2016 to January 2017. Details on the medical history, family history of diabetes and obstetric history were collected using a proforma.

After excluding pre-existing diabetes and impaired glucose tolerance cases, normal glucose tolerance and cases with incomplete data in our study. In this study 100 women were divided in two groups, Group I (n=50) were control group (non gestational diabetic) and Group II (n=50) was study group (gestational diabetic).

The Institute of Medicine (IOM) published revised pregnancy weight gain guidelines that are based on pre-pregnancy BMI ranges recommended by the WHO. These ranges are independent of age, parity, smoking history, race, and ethnic background. The revised IOM recommendations define normal weight as a BMI of 18.5-24.9, overweight as a BMI of 25-29.9, and obesity as a BMI of 30 kg/m^2or greater.[10] This IOM criteria was used to assess obesity during pregnancy in our study. Data collected was entered in Microsoft Excel and analyzed further using SPSS Software version 20.0.

Results

In present study maximum subjects 35 (70%) seen in control group and 31 (62%) in study group in 25-32 years of age group (table 1). The maximum women (n=31) were normal weight (BMI=18.5-24.9 kg/m^2) in control group (table 2) and in study group 27 women were normal weight (BMI=18.5-24.9 kg/m^2), followed by 18 women were overweight (BMI=25-29.9 kg/m^2) (table 3). Body mass index ≥ 25 was significantly higher (p= 0.033*) in cases than controls (44% vs. 22%) (table 4).

Table 1: Shows the age wise distribution of pregnant women in control and study group

Age (years)	Control Group	Study Group
18-24 yrs	13	10
25-32 yrs	35	31
>32 yrs	2	9

Table 2: Shows the age wise distribution of BMI in pregnant women in control group

Age (years)	Under weight BMI <18 kg/m^2	Normal weight BMI= 18.5-24.9 kg/m^2	Over weight BMI = 25-29.9 kg/m^2	Obese BMI = >30 kg/m^2
18-24 yrs	4	8	1	0
25-32 yrs	4	22	8	1
>32 yrs	0	1	1	0
Total	8	31	10	1

Table 3: Shows the age wise distribution of BMI in pregnant women in Study group

Age (years)	Under weight BMI <18 kg/m^2	Normal weight BMI= 18.5-24.9 kg/m^2	Over weight BMI = 25-29.9 kg/m^2	Obese BMI = >30 kg/m^2
18-24 yrs	0	7	3	0
25-32 yrs	1	16	12	2
>32 yrs	0	4	3	2
Total	1	27	18	4

Table 4: Shows the Comparison of BMI in pregnant women in Between groups

BMI (kg/m^2)	Study group	Control Group	Chi-square test	P-value
<25 kg/m^2	28	39	4.523	0.033*
>25 kg/m^2	22	11		

Discussion

In our study, 80% of women with GDM were also above 25 years of age. The probable reason may be considered population was educated and working in mostly in office. Even though, they are aware of chance of getting GDM with increasing age they never give it an importance in their busy schedule in multiparous women.

This study provides overweight women in pregnancy about the determinants of GDM, which could potentially help to incorporate early intervention measures. There was an increase in the frequency of gestational diabetes among obese women as illustrated in a study in the Indian Diabetic Clinic.[11]

Our study showed that overweight and obese women were more prone to develop GDM, as observed in other studies.[11-14] Several randomized trials have demonstrated that weight loss and increased physical activity reduce the risk of type 2 diabetes in individuals at high risk, including women with a history of GDM.[15] Similarly, evidence suggests that GDM risk is reduced in women who engage in high levels of physical activity[16] and consume high fibre diets.[17]

Therefore, to the extent that pre-pregnancy overweight and obesity cause GDM, reducing pre-pregnancy weight in these women should reduce diabetes-related adverse pregnancy out comes. Sustaining this weight loss beyond pregnancy should reduce women's future risk for type 2 diabetes.[18]

Increased BMI and insulin resistance is also linked to polycystic ovary syndrome (PCOS), especially in Indian subcontinent Asian women. Thus obesity, which is linked to PCOS, infertility, and irregular menstrual history were found to be important risk factors in our study. In a meta-analysis estimating the magnitude of GDM risk among women with high prepregnancy BMIs, Chu et al. found that GDM risk increases substantially with increasing pre-pregnancy BMI.[19]

In spite of these constraints, the study provides valuable information, which can be helpful in planning maternal health services, by early identification and providing high quality prenatal care to GDM women.

Conclusion

Our study showed that overweight and obese women with more than 25 years of age were more prone to develop GDM. We recommend that health authorities strengthen maternal health

programs by focusing on the prevention and control of modifiable risk factors during the pre-pregnancy period.

References

1. Expert committee on the diagnosis and classification of diabetes mellitus. Report of the expert committee on the diagnosis and classification of diabetes mellitus. Diabetes Care. 2003;26:S5–20.
2. American Diabetes Association. Gestational diabetes mellitus (Position Statement) Diabetes Care.2004;27:S88–90.
3. Diagnosis and classification of diabetes mellitus: American Diabetes Association Diabetes Care. 2013;36:4–5.
4. Unwin N, Whiting D, Guariguata L, Ghyoot G, Gan D, editors. 5th ed. Brussels: International Diabetes Federation; 2011. International Diabetes Federation, Diabetes Atlas; pp. 11–74.
5. Anjana RM, Pradeepa R, Deepa M, Datta M, Sudha V, Unnikrishnan R, et al. ICMR-INDIAB Collaborative Study Group. Prevalence of diabetes and prediabetes (impaired fasting glucose and/or impaired glucose tolerance) in urban and rural India: Phase I results of the Indian Council of Medical research-India Diabetes (ICMR-INDIAB)
   study. Diabetologia. 2011;54:3022–7.
6. Abate N, Chandalia M. Ethnicity, type 2 diabetes and migrant Asian Indians. Indian J Med Res.2007;125:251–8.
7. Seshiah V, Balaji V, Balaji MS, Panneerselvam A, Kapur A. Pregnancy and diabetes scenario around the world. Int J Gynaecol Obstet. 2009;104:S35–8.
8. Dang K, Homko C, Reece EA. Factors associated with fetal macrosomia in offspring of gestational diabetic women. J Matern Fetal Med. 2000;9:114–7.
9. K Sreekanthan, A Belicita, K Rajendran, Anil Vijayakumar. Prevalence of Gestational Diabetes Mellitus in a Medical College in South India: A Pilot Study. Indian Journal of Clinical Practice, Vol. 25, No. 4, September 2014.
10. Weight Gain during pregnancy. Committee Opinion No. 549. American college of obsteticians and gynecologists. Obstet Gynecol. 2013;121:120–2.
11. Kale SD, Kulkarni SR, Lubree HG, Meenakumari K, Deshpande VU, Rege SS, et al. Characteristics of gestational diabetic mothers and their babies in an Indian diabetes clinic. J Assoc Physicians India. 2005;53:857–63.
12. Albareda M, Caballero A, Badell G, Piquer S, Ortiz A, de Leiva A, et al. Diabetes and abnormal glucose tolerance in women with previous gestational diabetes. Diabetes Care. 2003;26:1199–205.
13. Hadaegh F, Tohidi M, Harati H, Kheirandish M, Rahimi S. Prevalence of gestational diabetes mellitus in southern Iran (Bandar Abbas City) Endocr Pract. 2005;11:313–8.
14. Siribaddana SH, Deshabandu R, Rajapakse D, Silva K, Fernando DJ. The prevalence of gestational diabetes in a Sri Lankan antenatal clinic. Ceylon Med J. 1998;43:88–91.
15. Knowler WC, Barrett-Connor E, Fowler SE, et al. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med. 2002; 346(6):393–403.
16. Zhang C, Solomon CG, Manson JE, Hu FB. A prospective study of pregravid physical activity and sedentary behaviors in relation to the risk for gestational diabetes mellitus. Arch Intern Med. 2006;166(5):543–548.
17. Zhang C, Liu S, Solomon CG, Hu FB. Dietary fiber intake, dietary glycemic load, and the risk for gestational diabetes mellitus. Diabetes Care. 2006;29 (10):2223–2230.

18. Artal R, Catanzaro RB, Gavard JA, Mostello DJ, Friganza JC. A lifestyle intervention of weight-gain restriction: diet and exercise in obese women with gestational diabetes mellitus. Appl Physiol Nutr Metab. 2007;32(3):596–601.
19. Chu SY, Callaghan WM, Kim SY, et al. Maternal obesity and risk of gestational diabetes mellitus. Diabetes Care. 2007;30 (8):2070–2076.