ISSN- O: 2458 - 868X, ISSN–P: 2458 – 8687
National Library of Medicine - ID: 101731606

International Journal of Medical Science and Innovative Research (IJMSIR)
IJMSIR : A Medical Publication Hub
Available Online at: www.ijmsir.com
Volume – 9, Issue – 2, April – 2024 , Page No. : 68 – 70

Excessive Maternal Weight Gain and its correlation with the Development of Gestational Diabetes Mellitus

[1]Dr. B. Dhivya, MD OG, Assistant Professor, Department of Obstetrics and Gynaecology, Dindigul Medical College.

[2]Dr. R.S. Balachandar, DGO, Junior Resident, Department of Obstetrics and Gynaecology, Dindigul Medical College.

Corresponding Author: Dr. B. Dhivya, MD OG, Assistant Professor, Department of Obstetrics and Gynaecology, Dindigul Medical College.

Citation this Article: Dr. B. Dhivya, Dr. R.S. Balachandar, "Excessive Maternal Weight Gain and its correlation with the Development of Gestational Diabetes Mellitus", IJMSIR - April - 2024, Vol – 9, Issue - 2, P. No. 68 – 70.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

To estimate the mean weight gain in pregnant mothers diagnosed with Gestational Diabetes mellitus (GDM) and comparing them with non GDM mothers, thus establishing a relationship between excessive weight gain in pregnancy and the subsequent development of GDM.

Keywords: GDM, Hyperglycemia, Pregnancies

Introduction

GDM is a global health concern, and in India the condition affects as many as 5 million women annually. Data from high-income countries indicate that GDM complicates approximately 5% to 7% of pregnancies. Excessive weight gain before the diagnosis of GDM and throughout pregnancy may drive the increasing insulin resistance and further exacerbate maternal hyperglycemia. Greater fat deposition may reduce the capacity to compensate for the physiological increases in insulin resistance that occur during pregnancy and is a significant risk factor for development of the condition. Compared to body weight alone, BMI has an added advantage and may provide new evidence for the prevention of GDM.

Materials and Methods

This is a retrospective case control study conducted at a tertiary care center in South Tamilnadu, India. The study population included a total of 136 pregnant women (GDM cases n = 68 and non GDM controls n = 68 over a period of one year from January 2022 to January 2023) who were observed and their weight gain noted over the pregnancy course. Data collection tool implied was the review of antenatal records from where the pre pregnancy BMI was collected and later their BMI at 24 weeks gestation was noted and mean weight gain through 24 weeks of pregnancy calculated.

The primary outcome was gestational weight gain through 24 weeks of pregnancy. Secondary outcomes were the Gestational age at delivery and mode of delivery of the cases and controls

Inclusion Criteria

Case: All pregnant mothers diagnosed with GDM (DIPSI guidelines)

Control: All pregnant mothers with normal glucose tolerance throughout pregnancy.

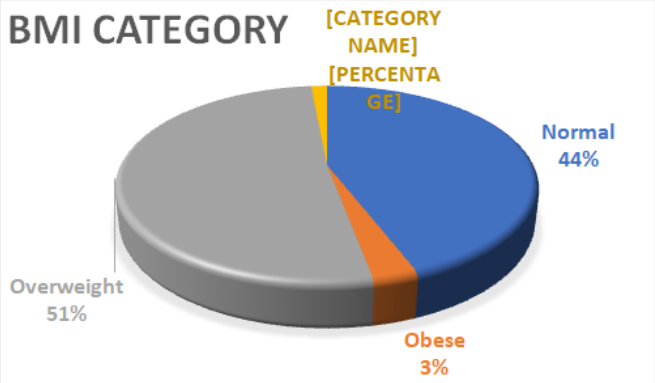
Exclusion Criteria

- Fetal congenital anomalies
- Multifetal gestation

- Preexisting Diabetes
- Overt Diabetes
- Patients with no AN records of their weights and /or OGCT values

Results

A total of 136 patients were included in the study with 68 cases (pregnancies complicated by GDM) and 68 controls (patients with normal glucose tolerance throughout) matched for Age, Obstetric score and Pre pregnancy BMI.

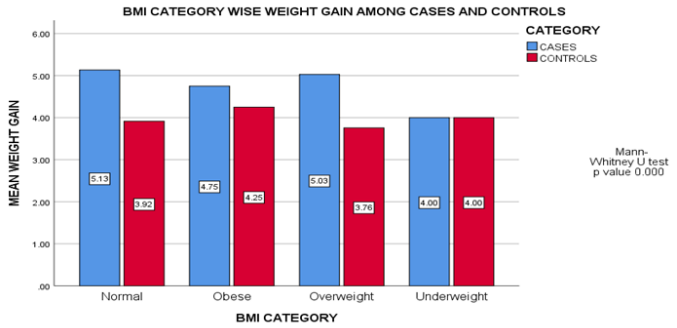


Among the total population studied, 44% belonged to normal BMI category, 2% were underweight, 51 % were overweight and 3% were obese

A statistically significant mean difference was found in-between the weight gain of cases and weight gain of controls. Mean difference was 1.2 kg with 95% confidence interval of 0.84 kg to 1.57 kg, and the p value was 0.002. The cases gained more weight than the controls

Table 1: Weight Gain in Cases Vs Controls

	Paired Differences					t	Sig.
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
				Lower	Upper		
Mean Differences of Weight Gain Between Cases and Controls	1.2	1.51	0.18272	0.84	1.57	6.599	0.002*



There was statistically significant mean difference between the Gestational age at delivery of Cases and Gestational age at delivery of Controls. Cases were delivered 2.23 weeks prior when compared with controls, and the p value was 0.003. GDM mothers were delivered earlier than non GDM mothers.

Table 2: Gestational age at delivery– Cases vs Controls

	Mean (weeks)	Paired Differences			t	Sig.
		Mean difference (weeks)	95% Confidence Interval of the Difference			
			Lower	Upper		
Cases	36.3 (±1.2)	-2.23	-2.62	-1.85	-11.496	0.003*
Controls	38.5 (±1.1)					

Mode of Delivery	Cases	Controls
Vaginal (Non Instrumental)	28 (31.8%)	60 (68.2%)
VACUUM	3 (75%)	1 (50%)
FORCEPS	1 (50%	1 (50%)
LSCS	36 (85.7%)	6 (14.3%)

Among the 42 LSCS totally done for the study population, 36 (85.7%) were from the cases and only 6 were from the Controls, and the p value was 0.001 which was statistically significant

Discussion

We found a significant difference between the weights that were gained by GDM mothers and the controls (non GDM). When examined by BMI category wise, this difference was pronounced among all categories except underweight patients.

These findings are of particular importance given the rising prevalence of overweight and obese women of childbearing age

Hence weight gain in early pregnancy (1st and 2ndtrimester)is an important indicator towards the subsequent development of GDM.

Earlier GA at delivery for the GDM mothers increased the risks associated with preterm birth summing up to perinatal morbidity and mortality

Majority of the LSCS that was done were for the cases of GDM than the controls (85.7% vs 14.3%) which further places the mother at risk of surgery.

Conclusion

Our study suggests that increased maternal gestational weight gain in early pregnancy may affect glucose metabolism and development of GDM that is not limited by BMI category.

Given the long term health implications of GDM on present and future pregnancies and also the cardiovascular health of the fetus, identifying potential areas of prevention may have radical effects in reducing the incidence or help in effective early management of GDM.

Novelty of the study

As gestational weight gain was collected only till the time of diagnosis of GDM, it avoids the confounding effect of treatment for GDM on maternal weight gain.

Limitations of the study

As all the data were from records, the study is subjected to ascertainment bias.

Lacunae in existing literature

Similar studies in several high income countries mainly focused on the overweight and obese BMI population rather than normal and the underweight.

Gestational Weight gain according to IOM recommendations was not estimated.

References

1. American Diabetes Association. Diagnosis and classification of diabetes mellitus. Diabetes Care 2006;29:S43–8.
2. World Health Organization. Global report on diabetes
3. Metzger, B. E. International Association of Diabetes and Pregnancy Study Groups recommendations on the diagnosis and classification of hyperglycemia in pregnancy. Diabetes Care **33**, 676–682 (2010).
4. Association of gestational weight gain with maternal and infant outcomes: a systematic review and meta-analysis, JAMA2017