

## Association of Age and BMI with Gestational Diabetes Mellitus - An Observational Study at a Tertiary Care Centre

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### Abstract

### Original Research Article

Gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance with onset or first recognition during pregnancy. GDM is associated with obstetric complications affecting health outcomes of both the mother and the neonate. To determine the age threshold and BMI association with increased risk of GDM, association between these two factors and GDM was studied. 190 women attending Antenatal OPD were included on first come first serve basis. Through a questionnaire, data was collected which included age among other factors. Prepregnancy weight and height were recorded and utilized to calculate a prepregnancy BMI. GDM was diagnosed using the IADPSG criteria. The mean age of the study subjects was 23.24 years. BMI was found to have significant association with GDM with a p value of <0.001. The prevalence of Gestational Diabetes Mellitus (GDM) was seen to be increasing with age and BMI.

**Keywords:** age, BMI, GDM.

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### INTRODUCTION

Gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance with onset or first recognition during pregnancy [1, 2]. India has the largest number of diabetics and is correctly termed as “the diabetes capital of the world”. GDM is associated with obstetric complications affecting health outcomes of both the mother and the neonate. These complications include macrosomia, cesarean delivery, shoulder dystocia and birth trauma, preeclampsia, post-partum maternal development of type 2 diabetes mellitus, as well as increased obesity and type 2 diabetes mellitus in the offspring later in life. Furthermore, neonatal metabolic complications may arise in the presence of poorly controlled maternal diabetes in pregnancy; these include hypoglycemia, hyperbilirubinemia, hypocalcemia, and polycythemia. Maternal age is an established risk factor for gestational diabetes mellitus (GDM), but there is no consensus on the age above which there is significantly increased risk of GDM. Obesity, as defined by BMI >29 kg/m<sup>2</sup>, remains an important and increasing risk factor for GDM. Also, this association appears to vary by race/ethnicity. To determine the age threshold and BMI association with increased risk of GDM, association between these two factors and GDM was studied.

### MATERIALS AND METHODS

The study was conducted in the department of Obstetrics and Gynaecology, SMS Medical College, Jaipur, Rajasthan, after approval from the Institutional ethical committee. The present study is a hospital based observational study conducted on 190 women attending Antenatal OPD. Women attending OPD were included on first come first serve basis. This study was conducted from February 2017 to February 2018. Willing participants were chosen between the age of 18-35 years with a singleton pregnancy, who gave written informed consent for the study. Women who had known pre-pregnancy diabetes mellitus, a prior pregnancy affected by GDM, a history of PCOS (Polycystic ovarian syndrome), or who were using metformin or corticosteroids were excluded from the study.

Through a questionnaire, data was collected which included age among other factors. Prepregnancy weight and height were recorded and utilized to calculate a prepregnancy BMI. GDM was diagnosed using the IADPSG criteria [3], which states that one or more values in the Oral Glucose Tolerance Test should be met or exceeded for the diagnosis of Gestational Diabetes Mellitus. Data was recorded and analysed.

## RESULTS AND DISCUSSION

The subjects were divided into two groups- Non-GDM and GDM. All those patients who had one or more abnormal value of either the fasting blood

sugar level (>92 mg/dl) or 1 hour level (180 mg/dl) or 2 hours level (153mg/dl) were considered to have GDM. This resulted in 98 subjects in GDM group and 92 in Non- GDM GROUP.

### Age

Mean age (Yrs)	23.24
SD	2.58
Median	23.00
Maximum	29.00
Minimum	19.00

**Table-1: Association of age Group with the Occurrence of Gestational Diabetes Mellitus (GDM)**

Age Group	GDM				Total (N=190)	
	Present (N=98)		Absent (N=92)		No.	%
	No.	%	No.	%		
15-20	7	30.43	16	69.57	23	100.00
>20-25	65	50.78	63	49.23	128	100.00
>25	26	66.66	13	33.34	39	100.00

Chi-square = 7.705 with 2 degrees of freedom; P = 0.021

Among the patients studied, maximum subjects were in the age group of 21-25 years. The mean age of the study subjects was 23.24 years. The prevalence of Gestational Diabetes Mellitus (GDM) was seen to be increasing with age (Table 1). There was a significant association between age and BMI, p value <0.05.

A study conducted by Terence T. Lao *et al.* [4] found that there was a significant difference and positive correlation in the prevalence of GDM with age. They concluded that the risk increased much more after the age of 25 years.

### BMI

Mean BMI (Kg/M <sup>2</sup> )	20.67
SD	2.61

**Table-2: Association of BMI with the Occurrence of Gestational Diabetes Mellitus (GDM)**

BMI	GDM				Total (N=190)	
	Present (N=98)		Absent (N=92)		No.	%
	No.	%	No.	%		
<18.5	9	29.03	22	70.97	31	100.00
18.5-25	80	53.33	70	46.67	150	100.00
>25	9	100.00	0	0.00	9	100.00

Chi-square = 14.944 with 2 degrees of freedom; P<0.001

The range of BMI at 11-14 weeks of gestation was 18 to 28 (Kg/m<sup>2</sup>) with a mean of 20.67 (Kg/m<sup>2</sup>). Maximum subjects belonged to the range of 18.5-25. Only 9 subjects had a BMI higher than 9 Kg/m<sup>2</sup>. In the present study, BMI was found to have significant association with GDM with a p value of <0.001 (Table 2).

In a meta-analysis done by Susan Y. Chu *et al.* [5], of about twenty studies, they also concluded that higher maternal weight and BMI are associated with a higher risk of GDM.

## CONCLUSION

Our study indicates that the association of GDM is significant with both age and BMI. But for

these to be able to be used as predictors, further research is needed.

## REFERENCES

- American Diabetes Association. Diagnosis and classification of diabetes mellitus (Position Statement). Diabetes Care. 2009; 32(Suppl. 1):S62-S67
- Metzger BE, Coustan DR. Summary and recommendations of the Fourth International Workshop-Conference on Gestational Diabetes Mellitus: the organizing committee. Diabetes Care. 1998;21(Suppl. 2):B161-B167
- International association of diabetes and pregnancy study groups recommendations on the diagnosis and classification of hyperglycemia in pregnancy.

Diabetes Care. 2010;33:676-682. [PMC free article] [PubMed]

4. Lao TT, Ho LF, Chan BC, Leung WC. Maternal age and prevalence of gestational diabetes mellitus. *Diabetes care*. 2006 Apr 1;29(4):948-9.
5. Chu SY, Callaghan WM, Kim SY, Schmid CH, Lau J, England LJ, Dietz PM. Maternal obesity and risk of gestational diabetes mellitus. *Diabetes care*. 2007 Aug 1;30(8):2070-6.