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Prevalence of gestational diabetes mellitus in a selected hospital in Kanyakumari district

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Abstract
Introduction: Gestational diabetes mellitus (GDM) is defined as carbohydrate intolerance of varying degree of severity with onset or first recognition during pregnancy.
Objective: To find the prevalence of GDM in a selected maternity centre in Kanyakumari district.
Materials and methods: Antenatal mothers (n=216) of 24-28 weeks gestational age attending the obstetrics and Gynaecology outpatient department (OPD)from May 2016 to April 2017 underwent 75gm oral glucose tolerance test (OGTT) irrespective of their last meal. Antenatal mothers with a history of diabetes were excluded from this study. Blood samples were drawn at 2 h and plasma glucose was estimated by GOD-POD method and the prevalence of GDM was computed based on Diabetes In Pregnancy Study group India (DIPSI) criteria.
Result: Among the 216 women screened 36 (16.7%) had GDM and among risk factors, higher BMI and Age was significantly associated with GDM.

Keywords: prevalence, gestational diabetes mellitus, diabetes in pregnancy study group India (DIPSI), oral glucose tolerance test

1. Introduction

Gestational Diabetes Mellitus (GDM) is defined as carbohydrate intolerance of varying degrees of severity with onset or first recognition during pregnancy [1]. The prevalence of Gestational Diabetes Mellitus is increasing. The International Diabetes Federation (IDF) estimates its global prevalence at 16.2%, with the highest rates of 24.2% in Southeast Asia and the lowest 10.4% in Africa. Studies done in 2015 showed that 16.2% pregnancies were complicated with hyperglycaemia, out of which 85.1% were due to GDM. In 2017 it was found that 1 in 7 births were affected by gestational diabetes [2].

Asian women are more prone to develop GDM than European women. Indian women have an 11-fold increased risk of developing glucose intolerance in pregnancy compared to Caucasian women [3]. GDM in India has varied from 2% [4] in 1980s to 16.55% in 2000 [5]. The prevalence of gestational diabetes has been reported to range from 3.8% in Kashmir, [6] 6.2% in Mysore, [7] 9.5% in Western India [8] and 17.9% in Tamil Nadu [9]. In more recent studies, using different criteria, prevalence rates as high as 35% from Punjab [10] and 41% from Lucknow have been reported [11]. The reason for undertaking this research study was to ascertain the prevalence of GDM in Kanyakumari District. This study was approved by the ethical committee of the Hospital.

2. Methods

A prospective screening for GDM in all pregnant women of 24-28 gestational weeks who are attending their antenatal OPD at Little flower hospital Kanyakumari during May 2016 to April 2017 (n=216). Informed consent was taken from all the participants. Diabetes in Pregnancy Study group India (DIPSI) method was used for diagnosing GDM underwent 75gm oral glucose tolerance test (OGTT) irrespective of fasting state. Women with a history of diabetes were excluded. Blood samples were drawn at 2 hr for estimating plasma glucose. Glucose was estimated by glucose oxidase peroxidise (GODPOD) method. DIPSI recommends 2-h plasma glucose >=140mg/dl with 75gm oral glucose load to diagnose GDM. General information on demographic characteristics, socio-economic status, education level, gravida, family history of diabetes and past history of GDM. To compare the mean values of GDM and non-GDM groups, t test was used and two tailed p value < 0.05 was considered statistically significant

3. Results

Out of 216 women screened at antenatal visit, 36 were diagnosed with GDM and prevalence of GDM was 16.7%.

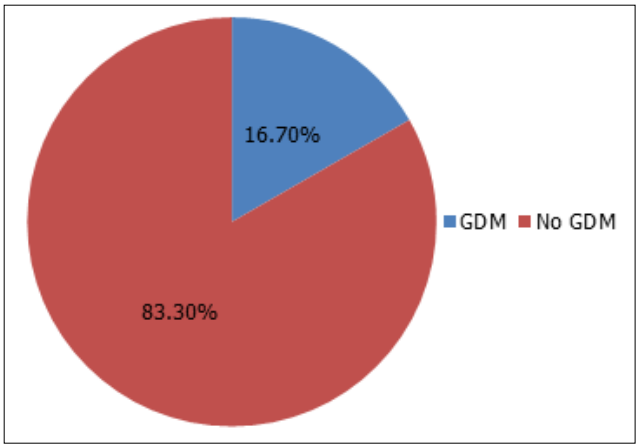

Fig 1: Prevalence of GDM

Table 1: Classification of Antenatal mothers by Age and BMI

Parameters	GDM group (N=36) Mean +/- SD	Non GDM group (N=180) Mean +/- SD	t (p)
Age	25.5 ± 2.5	24.6 ± 2.1	2.2 ($p < 0.05$)
BMI	30.5 ± 1.1	25.6 ± 2.5	11.0 ($p < 0.001$)

For age, the p value is < 0.05 and for BMI, the p value is < 0.001; which means that a significant association exists between prevalence of GDM and age as well as BMI.

Table 2: Classification of Antenatal mothers by Education, Gravida and Family history of Diabetes

Parameters	GDM group		Non GDM group		x^2
	N	%	N	%	
Education					8.1 ($p < 0.05$)
Higher secondary	0	0	13	7.2	
Under graduation	16	44.4	108	60	
> Undergraduation	20	55.6	59	32.8	
Gravida					5.8 ($p > 0.05$)
Gravida 1	20	55.6	133	73.9	
Gravida 2	16	44.4	45	25	
Gravida 3	0	0	2	1.1	
Family History of Diabetes					17 ($p < 0.001$)
Yes	21	58.3	43	23.9	
No	15	41.7	137	76.1	

Table 2 shows the classification of antenatal mothers by Education, Gravida and Family history of Diabetes. Majority of antenatal mothers in the GDM group had their education above under-graduation. (55.6%); were primigravida (55.6%). A total of 16 (44.4%) mothers were second gravida, among them 9 antenatal mothers had a previous history of GDM. In the GDM group (58.3%) had a family history of diabetes. Majority of antenatal mothers in the Non GDM group had their education up to under-graduation level. (60%); were primigravida (73.9%) and had a family history of diabetes (58.3%). The reported p value is low ($p < 0.05$) with respect to education and ($p < 0.001$) with respect to family history of diabetes. This shows that there is a significant association exist between prevalence of GDM and education as well as family history of diabetes.

4. Discussion

The present study reports a prevalence rate of 16.7%. The global prevalence of GDM at 16.2 %. Savitri D K conducted a study among 780 antenatal mothers from Jan 2016 to Dec 2016 in North Karnataka and concluded that 56 (7.1%) mothers developed GDM [12]. Manga Reddy K *et al.* conducted a retrospective study on GDM cases delivered from May 2015 to April 2017 at Medicity Institute of Medical Sciences, Ghanpur, Telangana revealed that the prevalence was 1.83 % [13]. Mohan B *et al.* did a Meta-analysis of 37 articles showed that the prevalence of GDM in India varies from 0.53% to 27.3% [14]. Paulose K P conducted a study in Thiuvananthapuram SUT Hospital among 700 antenatal mothers revealed that the prevalence of GDM is 11.2% (78) [15].

Bhavadharini *et al.* conducted a study in Tamilnadu and the results showed that the prevalence of GDM in urban and rural Tamil Nadu is 18.5 % [16]. In this study, data confirmed that increased BMI and age were risk factors for GDM. BMI is a modifiable risk factor. Lifestyle changes, dietary changes and physical activity can lead to modest weight reduction and decrease the prevalence of GDM. This study also suggests that mothers who are highly educated and mothers with a family history of diabetes are also prone for GDM. The International Diabetes Federation estimates, hyperglycaemia affects one in six births and GDM affects one in seven births.

5. Conclusion

GDM can adversely affect the mother and the baby. Universal screening and early precautions can save the mother from the complications of GDM and future diabetes in the mother and the newborn.

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