

Prevalence of gestational diabetes mellitus (GDM) among women attending antenatal clinic of a teaching hospital

Sivakumar Ramdoss

Assistant Professor, Department of General Medicine, Tagore Medical College, Chennai, Tamil Nadu, India

Received: 05-09-2020/ Revised: 09-10-2020 / Accepted: 28-10-2020

Abstract

Introduction: GDM has appeared to be growing diagnostic and epidemiological problem in recent years.¹ As per WHO GDM is defined as any degree of glucose with onset or first recognition during pregnancy. The two types of GDM include G1-impaired glucose tolerance with normal blood sugar which required diet modification alone and G2-hyperglycemia on fasting and postprandial requiring diet and insulin treatment. **Materials and Methods:** Data was collected from 180 pregnant women attending the antenatal clinic of Tagore Medical College, Chennai irrespective of period of gestation. The sampling method adopted was systematic random sampling technique. A pretested questionnaire was used to collect information regarding 4 socio-demographic details. And to diagnose Gestational diabetes mellitus DIPSI method was used. In this procedure after undergoing preliminary examination, a pregnant woman was given 75gm of oral glucose load, irrespective of whether she was in fasting or non fasting state and without regard to time of last meal. **Results:** In the present study the prevalence of GDM according to DIPSI criteria was 12.2%. Of the 180 pregnant women who participated in the study, 19 (10.3%) were in the age group of ≤ 19 years, 85 (47.2%) were in the age group of 20-24 years, 50 (28.1%) were in the age group of 25-29 years and 26 (14.4%) were in ≥ 30 years age group. **Conclusion:** In this study there is a greater prevalence of GDM in women with increasing age, higher parity. There is a need for universal screening to pick up gestational diabetes mellitus to prevent both maternal and fetal morbidity. Based on these results it concluded that, the diagnosis of GDM based on DIPSI method is a convenient, quick and cost effective.

Key Words: GDM, DIPSI criteria, hyperglycemia, questionnaire.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

GDM has appeared to be growing diagnostic and epidemiological problem in recent years.¹ As per WHO GDM is defined as any degree of glucose with onset or first recognition during pregnancy[1]. The two types of GDM include G1-impaired glucose tolerance with normal blood sugar which required diet modification alone and G2-hyperglycemia on fasting and postprandial requiring diet and insulin treatment[2].

GDM arises because the action of insulin is diminished (insulin resistance) due to hormone production by placenta. Other risk factors include older age, overweight, obesity, excessive weight gain, a family history diabetes and history of still birth or giving birth to infant with congenital abnormality[3].

GDM is a serious health concern because it not only pose immediate maternal (pre-eclampsia, cesarian delivery) and neonatal (macrosomia, shoulder dystocia, birth injuries, hypoglycemia, Respiratory distress syndrome) complications but also increase the risk of future type 2 diabetes in mother as well as the baby[4].

Recently, prevalence of GDM was found to be 18% in HAPO study (hyperglycemia and adverse pregnancy outcome). WHO estimated that prevalence of GDM in India was about 40.9 million in 2009 & is expected to rise to 69.9 million by 2025. Thus making it an important public health problem in India. Knowledge about GDM among an women will translate into adoption of healthy life style, better health seeking behaviour, better self-care and thus prevention and early diagnosis of the disease[5].

Recently, prevalence of GDM was found to be 18% in HAPO study (hyperglycemia and adverse pregnancy outcome). WHO estimated that prevalence of GDM in India was about 40.9 million in 2009 & is expected to rise to 69.9 million by 2025.

Thus making it an important public health problem in India. Knowledge about GDM among an women will translate into adoption of healthy life style, better health seeking behaviour, better self-care and thus prevention and early diagnosis of the disease[6].

Hence, this study is undertaken to estimate the current prevalence of GDM in urban area of Karnataka. This study may also provide evidence for routine screening of all pregnant women using DIPSI method.

Materials and methods

Study Design

A cross sectional study.

Study location

Department of General Medicine, Tagore Medical College, Chennai.

Study duration

January 2019 to December 2019 in Department of General Medicine, Tagore Medical College, Chennai.

Data was collected from 180 pregnant women attending the antenatal clinic of Tagore Medical College, Chennai irrespective of period of gestation. The sampling method adopted was systematic random sampling technique. A pretested questionnaire was used to collect information regarding 4 socio-demographic details. And to diagnose Gestational diabetes mellitus DIPSI method was used. In this procedure after undergoing preliminary examination, a pregnant woman was given 75gm of oral glucose load, irrespective of whether she was in fasting or non fasting state and without regard to time of last meal. Venous blood sample was collected at 2-hours for estimating plasma glucose under aseptic precautions. The blood sample was collected in Sodium Fluoride bulb and sent to laboratory of Biochemistry department Tagore Medical College, Chennai. GDM was diagnosed if 2-hours plasma glucose is ≥ 140 mg/dl. Numerical variables were analysed as means and standard deviation. SPSS version 16 was used for analysis of data.

*Correspondence

Dr. Sivakumar Ramdoss

Assistant Professor, Department of General Medicine, Tagore Medical College, Chennai, Tamil Nadu, India

E-mail: dr_siva1234@hotmail.com

Results

Table 1: Prevalence of GDM based on DIPSI criteria

Gestational diabetes mellitus	Number	Percentage
Present	22	12.2
Absent	158	87.8

In the present study the prevalence of GDM according to DIPSI criteria was 12.2%.

Table 2: Distribution of study subjects according to age group

Age group in years	Number	Percentage
≤19 years	19	10.3
20-24	85	47.2
25-29	50	28.1
≥30	26	14.4
Total	180	100

Of the 180 pregnant women who participated in the study, 19 (10.3%) were in the age group of ≤ 19 years, 85 (47.2%) were in the age group of 20-24 years, 50 (28.1%) were in the age group of 25-29 years and 26 (14.4%) were in ≥ 30 years age group.

Table 3: Distribution of study subjects according to BMI

BMI Categories (Kg/m ²)	Number	Percentage
Underweight(<18.5)	11	5.8
Normal (18.5 to 22.9)	93	51.7
Overweight (23 to 24.9)	42	23.6
Obese (>25)	34	18.9
Total	180	100

In the present study, majority of pregnant women 93 (51.7%) had normal BMI, 42 (23.6%) were overweight, 34 (18.9%) were obese and only 11(5.8%) were underweight. Mean BMI of the study participants was 22.48±3.05 kg/m. Range was 16.82-34.89kg/m.

Discussion

The prevalence of GDM in India varies from 3.8% to 21.0% in different parts of the country, depending on the geographical locations and diagnostic methods used. In the present study the prevalence of GDM based on DIPSI criteria was found to be 12.2%. There is wide variation in the prevalence of GDM in India. There are different studies conducted in various cities in India revealed prevalence of GDM as 13.4% in Chennai, 6.94% in Jammu, 6.6% in Western Rajasthan, 2.5% in Guntur, South India, and 7.8% in Kashmir. Another study done in Tamil Nadu showed that GDM was detected in 17.8%, 13.8% and 9.9% respectively in the women of urban, semi-urban and rural areas. However the wide variation in the prevalence rates of GDM may be attributed to the use of different criteria for diagnosis, variation in different geographical region[7,8]. In present study the mean age group of the study participants was 24.3±3.92 years. Of the 180 pregnant women who participated in the study, 10.3% were in the age group of ≤19 years, 47.2% were in the age group of 20-24 years, 28.1% were in the age group of 25-29 years and 14.4% were in ≥ 30 years age group, whereas study conducted in Kashmir showed that there were no participants < 19 years and half of the participants were in the age group of 26-30 years and only 1.3% study participants belonged to age group >35 years[9]. Another study done in Guntur, South India showed 53% study participants belonged to age group 21-25 years and only 4% belonged to >30 years of age. In the present study, majority of pregnant women 93 (51.7%) had normal BMI, 42 (23.6%) were overweight, 34 (18.9%) were obese and only 10(5.8%) were underweight. Mean BMI of the study participants was 22.48±3.05 kg/m. Range was 16.82-34.89kg/m[10].

Conclusion

The prevalence of GDM is 12.2% in the present study and there is a greater prevalence of GDM in women with increasing age, increasing BMI and there is a need for universal screening to pick up gestational diabetes mellitus to prevent both maternal and fetal morbidity. Larger studies are needed to analyse the risk factors for GDM in Indian women and plan for preventive strategies and to improve maternal and neonatal outcomes. Based on these results it concluded that, the diagnosis of GDM based on DIPSI method is a convenient, quick and cost effective.

Conflict of Interest: Nil Source of support: Nil

References

- Price LA, Lock LJ, Archer LE, Ahmed Z. Awareness of Gestational Diabetes and its Risk Factors among Pregnant Women in Samoa. *Hawaii J Med Public Health*. 2017;76(2):48–54.
- Petry CJ. Gestational diabetes : risk factors and recent advances in its genetics and treatment. *Br J Nutr*. 2010;104(6):775-87.
- Hirst JE, Tran TS, An M, Do T, Rowena F, Morris JM, et al. Women with gestational diabetes in Vietnam : a qualitative study to determine attitudes and health behaviours. *BMC Pregnancy Childbirth*. 2012;12:81.
- Arora GP, Thaman RG, Prasad RB, Almgren P, Brøns C, Groop LC, et al. Prevalence and risk factors of gestational diabetes in Punjab, North India : results from a population screening program. *Eur J Endocrinol*. 2015;173(2):257-67.
- Shriraam V, Rani MA, Sathiyasekaran BWC, Mahadevan S. Awareness of gestational diabetes mellitus among antenatal women in a primary health center in South India. *Indian J Endocrinol Metab*. 2013;17(1):146–8.
- Bhowmik B, Afsana F, Ahmed T, Siddiquee T, Ahmed T, Pathan F, et al. Evaluation of knowledge regarding gestational diabetes mellitus : a Bangladeshi study Evaluation of knowledge regarding gestational diabetes mellitus : a Bangladeshi study. *Public Health*. 2018;161:67–74.
- Nielsen KK, Rheinländer T, Kapur A, Damm P, Seshiah V, Bygbjerg IC. Factors influencing timely initiation and completion of gestational diabetes mellitus screening and diagnosis - a qualitative study from Tamil Nadu, India. *BMC Pregnancy Childbirth*. 2017;17:1–13.
- Bhavadarini B, Deepa M, Nallaperumal S, Anjana RM, Mohan V. Knowledge about Gestational Diabetes Mellitus amongst Pregnant Women in South Tamil Nadu. 2017;8(1):22-6.
- Elamurugan S, Arounassalame B. What do Mothers know about gestational diabetes : knowledge and awareness. *Indian J Obstetr Gynecol Res*. 2016;3(4):393–6.
- Arulmani A, Annie IK, Felix AJW. Prevalence of Gestational Diabetes Mellitus among Cohort of Pregnant Women Registered in Primary Health Center. *JMSCR*. 2016; 4(10): 13239–43.