DIPSI - A SINGLE STEP PROCEDURE FOR SCREENING AND DIAGNOSIS OF GESTATIONAL DIABETES MELLITUS

Keerthiha, B*., Sangeereni, M and Mallika, A

Department of Obstetrics and Gynaecology, Rajah Muthiah Medical College and Hospital, Annamalai University, Annamalai Nagar – 608 002

ARTICLE INFO	ABSTRACT
	Background: Indian women have eleven fold increased risk of developing glucose intolerance during pregnancy compared to Caucasian women. Universal screening for GDM is essential in India. However, the screening and diagnosis of gestational diabetes mellitus (GDM) continues to be a contentious issue. Notwithstanding decades of research and several international workshops devoted to GDM, there is still no consensus among international bodies on a uniform global approach for screening and diagnosis of GDM[1]. The lack of consensus regarding the screening and diagnostic criteria for GDM means that different sets of women would be identified as having GDM by the different criteria. The guidelines used depend on several factors like the availability of infrastructure, cost considerations and patient convenience. Poor dissemination of information and availability of resources could be some of the reasons for these conflicting guidelines used in different settings. This study was undertaken to find out a single step procedure which serves both as a screening and a diagnostic tool. **Methods:** This study was carried out in a tertiary care teaching institute in Chidambaram.100 pregnant women with gestational age between 24-28 weeks were subjected to 75 grams OGTT recommended by DIPSI and venous blood sample was drawn after 2 hr. **Results:** Out of 93 patients (7 subjects who developed GI intolerance were dropped out) 18 patients were diagnosed to have GDM (19.3%). Mean glucose value in GDM patients was 161.40 ± 28.05mg/dl whereas in Non GDM group it was 111.64 ± 12.03mg/dl with p value < 0.001 which is significant. **Conclusion:** High prevalence of GDM may be because of high sensitivity of DIPSI. This method serves both as a screening and diagnostic procedure and is simple, reliable, feasible, easy to perform, economical especially in Indian settings.

INTRODUCTION

India is being recognized as "The Diabetes Capital of the World". Diabetes is a major health problem in India with prevalence rates between 4.6% and 14% in urban areas, and 1.7% and 13.2% in rural areas respectively. India has an estimated 62 million people with Type 2 Diabetes mellitus; this number is expected to go up to 79.4 million by 2025[2]. In parallel with increased diabetes prevalence, there is a rise in the prevalence of gestational diabetes mellitus.

Gestational Diabetes Mellitus is defined as carbohydrate intolerance of variable severity with recognition or onset during pregnancy, irrespective of the treatment with insulin. GDM is associated with maternal as well as fetal complications including gestational hypertension, pre eclampsia, increased rate of caesarean section, fetal macrosomia, sudden intra uterine death, shoulder dystocia, birth trauma & increased perinatal mortality[3]. Therefore the identification and early diagnosis of GDM are important for both maternal and fetal health.

Corresponding author: **Keerthiha, B**

Department of Obstetrics and Gynaecology, Rajah Muthiah Medical College and Hospital, Annamalai University, Annamalai Nagar – 608 002
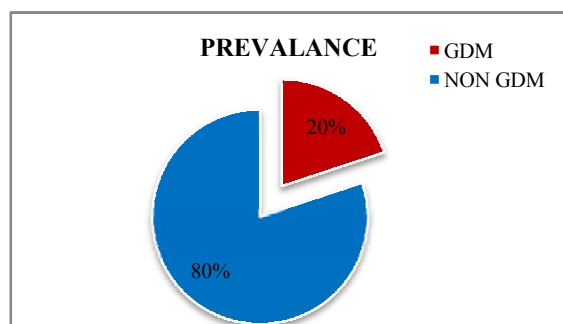
A worldwide consensus on the diagnostic criteria recommended screening test for GDM has not yet been reached and new diagnostic criteria are being introduced over time to avoid exposure of pregnant women to non physiological glucose loads for which DIPSI has come up with a simple test. Its still a dilemma about which test to apply to our Indian population. Therefore, this study was undertaken to find out a one step procedure which serves both as screening & diagnostic tool at the same time & which is acceptable, reliable, economical& feasible to perform in Indian context.

This study is being carried out to find out prevalance of GDM, using DIPSI guidelines, in pregnant women attending antenatal OPD of Rajah Muthiah Medical College, Chidambaram.

METHODS

This study was carried out in a tertiary care teaching institute in Chidambaram from November 2014 to October 2016. The study protocol was approved by the Institutional Ethical Committee. Pregnant women with gestational age between 24-28 weeks were enrolled in this study. All women were informed about the nature of the study and informed consent taken. Patients of overt diabetes mellitus (random blood glucose level ≥200 mg/dl before 24 weeks of gestation) were excluded from the study. A total of 100 pregnant women underwent detailed clinical examination, irrespective of presence or absence of risk factors. Details of family history of diabetes, history of previous pregnancies, and the socio-economic status were obtained. Blood pressure measurement and the body mass index were recorded.

Irrespective of their fasting status all the study subjects were given 75 grams of anhydrous glucose (Readily hours of oral glucose, 1 ml of venous blood sample was collected in fluoride-oxalate bulb for estimation of blood sugar level. Samples were centrifuged immediately and plasma was separated. Plasma glucose level was estimated using GOD-POD method using Erba system packs on Transasia XL-360 fully automated clinical chemistry analyzer[4].

In GDM cases, Mean age was 28.75± 5.25 years, Mean BMI was 26.67± 3.22 kg/m², Mean 2nd hour glucose was 161.40± 28.05mg/dl. This shows that increasing age & BMI were significant risk factors for developing GDM.

	GDM		NON GDM	
	MEAN	**SD**	**MEAN**	**SD**
AGE (years)	28.7500	5.25031	24.4189	4.7715
BMI (kg/m²)	26.6700	3.22133	22.5986	2.56144
2nd hr GLUCOSE (mg/dl)	161.40	28.05708	111.64	12.03599

A report of ≥140 mg% was diagnosed as GDM. A reading of 120-140 mg% was labeled as decreased gestational glucose tolerance (DGGT). Values more than 200 gm% indicate overt diabetes mellitus[5]. All the required facilities and equipment were available in the department of biochemistry. The study did not involve any harm to the any patient involved.

RESULTS

Out of 100 subjects, 7 patients who developed GI intolerance were dropped out. Among 93 pregnant women, 18 cases were found to be GDM. This indicates that prevalence of GDM is 19.7% among antenatal women attending OPD.

DISCUSSION

Pregnancy is diabetogenic state manifested by insulin resistance and hyperglycemia and is implicated to be associated with significant obstetric complications. Diabetes complicates 3-4% pregnancies according to various researchers in America, Europe and Asia. Gestational diabetes has a rising trend in the recent times and depending on the type of population, it is said to complicate 1 - 16% of all pregnancies[6].

In our study 18 out of 100 mothers were diagnosed as GDM the prevalence being 19.7% in our hospital. A simple test procedure by single step 75 gm OGTT was used in this study to screen and diagnose the cases of GDM. This test procedure is done in the nonfasting state which is justified as a patient with GDM has an underlying defect in secretion of insulin. Consequently her glycemic level increases with a meal and with glucose challenge this glycemic excursion exaggerates further. The second important reason for recommending this procedure is because the specificity of the ADA screening test with 50 g 1 – hr GCT without regard to time of last meal is low. It is thus preferable to perform this single step procedure as compared to 50gm-1 hr test and then 100 gm OGTT. This single step procedure serves both as screening and diagnostic test for GDM, is simple, economical and feasible[7].

Similar studies in Sri Lanka have demonstrated that fasting plasma glucose is unsuitable for screening. The 2 hr 75 g blood glucose at a threshold more than 140 mg/dl is sensitive and specific[8]. This single step procedure is more acceptable, less expensive and less invasive.

The prevalence of GDM is 19.7% by this study. This is similar to a survey performed at an antenatal clinic at Chennai which showed prevalence of GDM by 75 gms 2 hour plasma glucose level with OGTT done in fasting state 16.2%. The prevalence of GDM ranged from 9.9% to 17.8% in a study conducted in south India using fasting DIPSI criteria. Parikh P *et al* found 13.79 % prevalence of GDM in a OPD based study[9]. Gopalkrishnan *et al* reported very high prevalence of GDM (41.9%) using IADPSG criteria in North Indian population in Lucknow (n=322)[10]. The rise in prevalence of Gestational Diabetes in our community and its associated increased risk of pregnancy and delivery complications justifies a need to screen pregnant mothers who attend the antenatal clinic. Our results suggest that a policy of universal screening for

GDM should be adopted in all antenatal clinics and 75 gm OGTT has a high predictive value. This single step procedure is a simple economic and feasible method. It serves both for the purpose of screening and diagnosis at the same time. So looking towards the socio demographic characteristics of our patients, it should be followed in our region to achieve a better outcome.

Despite some limitations in terms of less number of subjects & not being a population based study, the findings of this study were significant and consistent with other recent studies addressing GDM screening.

CONCLUSION

For universal screening, we suggest a single non fasting OGTT with a 75 gram of oral glucose load and diagnosing women with 2 hour PPG ≥140 mg/dl as GDM. This method, recommended by Govt of India serves both as a one-step screening and diagnostic procedure and is easy to perform besides being economical. Further studies are required to device highly sensitive screening & diagnostic criteria which are practical & feasible in Indian set up.

Bibliography

1. Holt RI, Coleman MA, Mc Cance DR. The implications of the new International Association of Diabetes and Pregnancy Study Groups (IADPSG) diagnostic criteria for gestational diabetes. Diabet Med. 2011; 28:382–5.

2. Anjana RM, Pradeepa R, Deepa M, Datta M, Sudha V, Unnikrishnan R, *et al*. 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(12): 3022-7.

3. Landon MB, Mele L, Spongy CY. Relationships between maternal glycemia and perinatal outcome. Obstet Gynecol. 2011;117:218-24.

4. Trinder P, Ann. Clin. Biochem. 1969;6:24-

5. Seshiah V, Das AK, Balaji V, Joshi SR, Parikh MN, Gupta S. Gestational Diabetes Mellitus-Guidelines. *JAPI*. 2006;54:622-2.

6. Jiménez-Moleón JJ, Bueno-Cavanillas A, Luna-del-Castillo JD, Lardelli-Claret P, García-Martín M, Gálvez-Vargas R; Predictive value of screen for GDM Influence of associated risk factors. Acta Obstet Gynecol Scand., 2000; 79(11): 991-998.

7. Seshiah V, Balaji V, Balaji MS, Sekar A, Sanjeevi CB, Green A; One Step procedure for screening and diagnosis of gestational diabetes mellitus. *J Obstet Gynecol India*, 2005; 55(6): 525–529.

8. Wijeratne CN, Ginige S, Amarasinghe A,Egodage C, Wijewardena K; Screening for gestational diabetes mellitus the Sti Lankan experiences. *The Ceylon Medical Jornal;* 2006; 51: 2:53-58.

9. Parikh P, Shah A, Joshi D, Shah R. Prevalence of gestational diabetes mellitus at tertiary care center. *IJSRP*. 2014;4:9.

10. Gopalakrishnan V, Singh R, Pradeep Y, Kapoor D, Rani AK, Pradhan S. Evaluation of the prevalence of gestational diabetes mellitus in North Indians using the International Association of Diabetes and Pregnancy Study groups (IADPSG) criteria. *J Postgrad Med*. 2015;61:155-8.

****