Indian Journal of Obstetrics and Gynecology
Volume 3 Number 1, January - June 2015
DOI:https: / / dx.doi.org / 10.21088 / ijog.2321.1636.3115.1

Screening & Diagnosis of Diabetes Mellitus During Pregnancy "Diversity needs uniformity"

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Gestational Diabetes Mellitus (GDM) is a substantial health problem in many parts of the world specially in our country, India. Diagnosis of GDM is a subject of considerable controversy and there are no uniform international standards to identify GDM.

Many unanswered queries remain, like:

- Is GDM an entity worth diagnosis?
- Whether to treat minimally higher level of blood sugars (BS)
- What to do if only one value is abnormal in oral glucose tolerance test (OGTT)
- How useful is the screening on basis of risk factors or should it be universal screening ?
- When to start diagnosing GDM?
- How to diagnose? In one or two steps?
- How to differentiate from pregestational diabetes when GDM is first recognized during pregnancy?
- The most important issue is: What cut off and how many values should be considered to diagnose GDM?

It was once thought that whether GDM is entity worth diagnosis but now it is evident that GDM is associated not only with increased perinatal morbidity and mortality but also leads to future development of obesity, diabetes and metabolic consequences in offspring and increased incidence of type II diabetes mellitus (DM) in mother. It increase each additional pregnancy having GDM. It can be considered as stage of evolution of type II DM and can be considered as sentinel event in women's life opportunity to prevent or delay onset of type II DM in them. Now evidences exists that there is benefit of even treating mild GDM.[1] There is intergeneration transmission of DM and two generations are at risk. Early diagnosis and treatment of GDM may help in prevention of diabetic epidemic. I personally feel that each and every woman should be assessed for GDM after all it is just a matter one simple blood test.

To obviate the need of OGTT in all women, selective screening strategies are there on the basis of risk factors. Various risk factors and their relative risks are depicted in Table 1. Screening strategies by different organization are shown in table 2. In a study, 2426 pregnant women were evaluated by NICE, ADA, ADIPS screening guidelines (Table 3). Large number of women needed to be screened on

Table 1: Risk factors of GDM and their relative risk

	Relative risk
Age >25 years (>35 years)	1.4 (2.3)
Over weight (obesity)	2 (3.7)
Family history of diabetes (first degree)	3.2 (7)
Previous GDM	23
Previous unexplained IUD	-
Large baby	3.3
Member of ethnic group of high prevalence	7.6
Polycystic ovary syndrome	2.9
Polyhydramnios during pregnancy	-

(Data for Clinic North America, 2010)

Table 2: Screening guidelines in various countries for GDM 2011

UKNICE *Any one of following*	USADA *No screening if all criteria present*	ADIPS *Universal screening selective in limited resources*
Previous macrosomia (>4.5 kg)	Normal weight	Age >30 yr, obesity
BMI >30kg/m^2	Age <25 yr,	Glycosuria
Previous GDM	No poor obs outcome	Previous adverse pregnancy outcome
Family h/o diabetes	No previous GDM or abnormal glucose metabolism	Previous GDM or abnormal glucose tolerance
Origin from high prevalence	No family history	Family h/o Type II DM
	No high risk ethnic group	High risk ethnic group

Table 3: Selection and detection rate by various guidelines

	No. of women need to be screened	Detection rate	Missed cases	Specificity
NICE	70%	92.7%	7.3%	32%
ADA	96.5%	100%	0%	4%
ADIPS	87%	98.6%	1.4%	14%

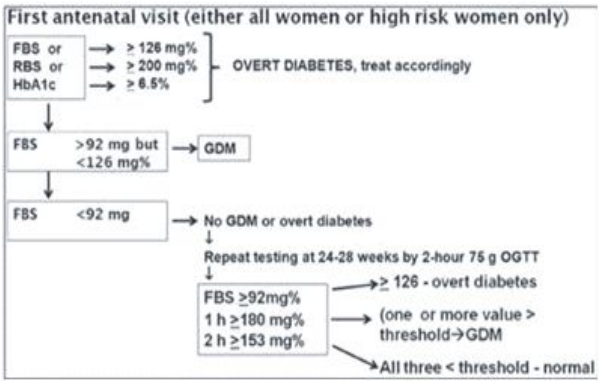
basis of risk factors.

Only 5-10% women meet all criteria, need not be screened on basis of risk factor. Hence there seems to be little benefit of selective screening over universal one. In interest of simplicity, universal screening is being accepted by many organizations. In our Indian population being high risk ethnic group, universal screening must be a standard of care.

There is no concensus as how best to identify patients with GDM. After pioneer work of O'Sullivan, 50 gm Glucose Challenge Test (GCT) is used to identify potential cases of GDM for last 3 decades. Traditional method is in 2 steps. First to screen cases with GCT where 50 gm glucose is given in fasting or fed state and BS is checked after 1 hour. Cases with blood sugar ≥140mg% should undergo 100 gm OGTT. Blood sugar values of fasting, 1, 2, 3 hours cut off are taken as 95mg%, 180mg%, 150mg% and 140mg% respectively (Carpentin and Cousten 1982). Any 2 values above cut off can be diagnosed as GDM.

Due to lot of confusion and inconvenience, WHO recommended single step method with 75gm glucose load, 2 hour value ≥ 140mg% (>7.8 nmol / L) can be taken as GDM. It is simple, feasible convenient with less confusion. It can be performed even in non fasting state. Diabetes in pregnancy study group of India (DIPSI) accepts the same criteria. Degree of glucose intolerance to be labeled as GDM is controversial for long and key sticking point in diagnosis of GDM. Results of large observational HAPO study (hyperglycemia and adverse pregnancy outcome), conducted on 25,000 pregnant women in 15 centres of 9 countries (unfortunately India was not a part of the study) with 75 gm OGTT, confirmed the occurrence of adverse pregnancy outcome even below traditional cut off for GDM in continuous association with increasing maternal glucose concentration. These results led to propose the lowering of diagnostic criteria of GDM substantially. International Association of Diabetes and Pregnancy Study Group (IADPSG)-panel of experts from 40 countries established the new criteria of maternal glucose concentration on the basis of adverse pregnancy outcome (birth weight

IADPSG 2: phase strategy for detecting diabetes in pregnancy



and c-peptide, infant body fat >90th percentile) which occurred by odd ratio of 1.75 compared to mean. American association (ADA) also approves the same[3].

IADPSG and ADA criteria to diagnose GDM[4] by 75 gm glucose after fasting.

- Fasting >92mg%
- One hour value ≥180 mg%
- 2 hour value ≥153 mg%

GDM is diagnosed when any one or more out of these three values is abnormal. So now previous query of what to do if one value is abnormal in bygone.

Now the last problem is definition of GDM (still used by ACOG) is any degree of glucose intolerance (at any period of gestation) first diagnosed during pregnancy is GDM. This definition does not exclude diabetes existing prior to pregnancy. Whereas this distinction is crucial, as diabetes at the time of inception is definitely associated with higher risk of adverse outcome specially congenital anomalies in fetus and diabetes complication in mother. IADPSG recommended new terminology, where diabetes first recognized during pregnancy can be classified as either overt or gestational.

Overt diabetes is present if any of following is found at first antenatal visit.

- Fasting blood sugar >126mg%
- HbA1C >6.5%
- Random blood sugar ≥200 mg%

Diagnosis of overt diabetes is a separate entity now and indicates towards type II DM in women in childbearing age. IADOSG has purpose 2 phase strategy for diagnosis of diabetes during pregnancy.

It is as follows:

1. At first antenatal visit we can diagnose diabetes during pregnancy with just one value of BS.
2. We can differentiate between GDM and overt diabetes as this distinction is very crucial for pregnancy outcome.
3. Need of OGTT is obviated if diagnosed at first visit
4. OGTT is same as non-pregnant, hence no lab confusion
5. Although it does not differentiate to test in high risk or all, I personally feel, it is a matter of just one blood test FBS or RBS. It should be in panel of basic investigation of all pregnant women so GDM or overt diabetes can be detected early. It has to be done for all pregnant women in our population.
6. Now no dilemma of management if one abnormal value of OGTT which we used to face previously.

In my view, the guidelines given above has merits.

There were so many confusions and debates in diagnosis of GDM. Diversity in diagnosis needed uniformity. After HAPO study results, IAPSG proposal is probably the right approach and this seems to be the beginning of end now towards uniformity.

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