Fifth National Conference of Diabetes in Pregnancy Study Group, India

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"Diabetes Free Generation - Focus on the Fetus for the Future"

"A single step procedure with a single glucose value" to diagnose abnormal glucose tolerance during pregnancy in the community - Indian Guidelines*

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1. Gestational Diabetes Mellitus (GDM)

1.1 Defining the condition and the aim of the declaration:

GDM is a clinical entity associated with a significant incidence of diabetes, in the later life of the mother and an increase in the fetal, neonatal morbidity and future development of obesity and diabetes in the offspring.[1,2]

Pregnant women belonging to a high risk ethnic population (e.g. Indians) require ***Universal Screening.*** This observation emphasizes the need for an appropriate diagnostic tool to diagnose and method to treat GDM and to incorporate them into the local health service arrangements.[3]

1.2 Diagnostic criteria:

1.2.1 WHO criteria: In much of the world, WHO diagnostic criteria is followed. GDM is diagnosed, if 2-hour plasma glucose >140mg/dl, with 75-g OGTT similar to that of Impaired Glucose Tolerance (IGT) outside pregnancy.[4] WHO procedure for diagnosing GDM was not developed specifically for use during pregnancy, nor are thresholds set for detection of either maternal or fetal complications.

1.2.2 Diabetes in Pregnancy and Awareness Project (DIPAP) - Validation of WHO criteria: In India, a community based study (DIPAP), was performed to ascertain the prevalence of GDM in a cohort of 12,056 pregnant women living in urban, semi - urban, and rural areas by using WHO criteria. Among them, the overall prevalence of GDM was 13.9%.[5] Further, to ascertain the consistency of WHO criteria in diagnosing GDM, after determining the desired sample size with the required statistical power, a total of 1246 pregnant women underwent 75g OGTT. Among them 13.2% were detected to have GDM with a 2hr PG ≥ 140 mg/dl. This finding substantiates and validates the previous prevalence data as well as the WHO criteria. Thus 2 hour plasma glucose ≥ 140 mg with 75 gm oral glucose load has been accepted by the Diabetes in pregnancy Study group India (DIPSI) for diagnosing GDM (our population do not accept diagnosis based on FPG).

1.3 Short Term and Long Term Implications for the Progeny of GDM:

1.3.1 Increased birth weight of neonates was observed even when the mother's glucose tolerance was less than the glycemic criteria recommended by WHO for diagnosing GDM.[6] The occurrence of macrosomia was continuum as the 2 hour plasma glucose with 75 gm OGTT, increased from 120 mg/ dl.[7,8]

1.3.2 In children born to mothers who had third trimester plasma glucose 120 - 139 mg/ dl, the cumulative risk of developing type 2 diabetes was 19 % at age 24 years and this risk almost doubled to 30% with respect to those women who had 2 hour plasma glucose 140- 199 mg/ dl.[9]

1.3.3 Thus both short - term and long - term morbidity in the offspring increases with increasing maternal glycemic levels, however the mode change occurs at the inflection point of maternal 2 hour plasma glucose > 140 mg/dl.

1.4 "A one step procedure with a single glycemic value", to diagnose GDM in the community:

1.4.1 In the antenatal clinic, a pregnant woman after undergoing preliminary clinical examination is given a 75 g oral glucose load, irrespective of whether she is in the fasting or non fasting state, without regard to the time of the last meal. A venous blood sample is collected at 2 hours for estimating plasma glucose by the GOD- POD method#. GDM is diagnosed if 2- hour plasma glucose is ≥ 140 mg/ dl.

1.4.2 This procedure assumes clinical relevance as WHO criteria based on glucose level > 140 mg/ dl at 2 hours after, 75 g oral glucose load administered irrespective of whether the pregnant woman had anything to eat or not, was able to correctly identify subjects with GDM, as well as woman

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with normal glucose tolerance.[10]

a. Causes least disturbance in a pregnant woman's routine activities.

b. Serves as both screening and diagnostic procedure.

1.5 Clarity in Categorizing Abnormal Glucose Tolerance in Pregnancy

2 hr plasma Glucose	In Pregnancy	Outside Pregnancy
> 200 mg/ dl	Diabetes	Diabetes
> 140 - 199 mg/ dl	Gestational Diabetes Mellitus(GDM)	Impaired Glucose Tolerance (IGT)
120- 139 mg/ dl*	Gestational Glucose Intolerance (GGI)	-
< 120 mg/ dl	Normal	Normal

* Needs follow up

The term IGT should not be used to indicate any glucose intolerance in pregnancy (as this terminology is used outside pregnancy)

1.6 Gestational Weeks for Screening

By following the usual recommendation of screening between 24 and 28 weeks of gestation, the type 2 diabetes that existed prior to this index pregnancy is likely to be missed. Hence early screening in the first trimester is suggested[11] and if the 2hr PG > 200mg/dl, she is an overt diabetic detected during this pregnancy.

1.7 Target Blood Glucose Levels

a. In normal pregnancy, the mean plasma glucose (MPG) + 1 SD value for fasting is 89 mg/ dl, and 2- hour is 122 mg/dl (DIPAP, n= 12, 056).[5,12]

b. Thus, maintenance of MPG level ~ 105 to 110 mg/ dl is desirable for a good fetal outcome.[13]

c. This is possible if FPG and peak postprandial glucose levels are maintained ~ 90 (80- 90) mg/ dl and ~ 120 (110 - 129) mg/ dl respectively.

2. Monitoring#

Two hour post meal monitoring is preferred as the diagnosis of GDM is also based on 2 hour plasma glucose. It is easier to remember this timing, as the time for diagnosis and also for monitoring is the same.

#Laboratory facilities and technical staffs are not available in all the places. A simple procedure of measuring capillary blood glucose (cbg) seems to be more convenient than venous plasma glucose (vpg) in general practice[14] for diagnosis of GDM and monitoring glycemic control. No significant difference was seen, in the inter relations of cbg and vpg with respect to gestation, glucose tolerance and analytical method[15,16] provided the glucometer of high precision is used with continuous quality assurance procedures are followed.

3. Conclusion

Preventive measures against type 2 DM should start during intra- uterine period and continued throughout life from early childhood. The maternal health and fetal outcome depends on the care by the committed team of physicians, obstetricians and neonatologists.

"Clinical wisdom dictates that type of screening, universal or selective, and threshold selection should be performed in conjunction with the population-specific profile. This practical, cost-effective approach will address patient needs and remove from the stage an artificial controversy that leads to sophistry and pontification at public expense".[17]

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