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Consultant Obstetrician & Gynecologist at Navi Mumbai

Vice Chairman, Indian College of Obstetrics & Gynecology (2018) & Chairman Elect 2021

VICE PRESIDENT Federation of Obstetrics and Gynecological Societies of India (2015)

Treasurer, PCOS Society Of India

Chairperson Medical Disorders of Pregnancy Committee of FOGSI (2006-2008)

Founder Secretary & Past President Of Navi Mumbai Obstetric & Gynec Soc.

Joint Secretary FOGSI (2005)


Ultrasonography/ Maternal Medicine/ Fetal Medicine/ High Risk Pregnancy
Gestational Diabetes

Dr Uday Thanawala
MD, DGO, FCPS, DNB.

18th Symposium of Cambodian Gynecology and Obstetrics on “Maternal and Newborn Health”
22-23rd November 2019
Changing Priorities of Mankind

Twentieth Century – Famine / Plague / War / Manageable Challenges

Twenty-first Century -

More deaths due to NCD & Obesity
2012 – 56 million deaths
620,000 died due to human violence
8,000,000 committed suicide
1.5 million died of diabetes – sugar is more dangerous than gun powder
Diabetes: A global emergency

FIGO recommends that hyperglycemia/Gestational Diabetes Mellitus (GDM) be considered a global health priority.
FETAL ORIGIN OF ADULT DISEASE

Edited by DJP Barker

BMJ
Maternal health – impacts NCD burden
Foetal Programming IUGR and Macrosomia

Maternal under nutrition
Maternal stunting
Anaemia
Malaria
Other medical conditions

Barker’s Hypothesis
Low birth weight

Pederson’s hypothesis
Macrosomia

Maternal overweight / obesity
Diabetes
Excess weight gain during pregnancy

Predisposes development of HTN, Type 2 DM & IGT

Solution
Optimal birth weight
3000 – 3500 g.
It all starts with a healthy pregnancy

- Prenatal period a window of opportunity for prevention of childhood obesity & adult diabetes
Where we were a decade back -

- Lack of awareness :
- Importance of diagnosing & treating GDM
- Incidence of GDM in our population
- Controversies in testing -
  Whom to test?
  When to test?
  Which test?
Incidence in our population:

Chennai - 17.8% women in urban, 13.8% in semi urban, 9.9% in rural areas.


King et al. (16), in 2005, reported on diabetes in Cambodia – 5% (rural) and 11% (semiurban).

In India alone, an estimated 5 million women have GDM/year.

One out of five pregnancies have Diabetes - HIP

Global
21 million
GDM per year
Different Health Provider settings in INDIA

How to test so many women for GDM?
Which Screening tests? (numbers in each group)

GDM - A survey amongst Obstetricians in India (2009)
2 Step testing - Challenges with the OGTT

- Poor recall once a screening test came positive
- Cumbersome test (True for IADPSG also)
- Logistically difficult to implement in low resource settings
A single test procedure to diagnose gestational diabetes mellitus

C. Anjalakshi · V. Balaji · Madhuri S. Balaji · S. Ashaala · Sheela Suganthi · T. Arthi · M. Thamizharasi · V. Seshiah

Received: 19 July 2007/Accepted: 9 September 2008/Published online: 2 October 2008
© Springer-Verlag 2008

Abstract Universal screening for gestational diabetes mellitus (GDM), detects more cases and improves maternal and offspring prognosis. Of all the screening tests, World Health Organization (WHO) procedure is simple and cost effective; the only disadvantage is that the pregnant woman has to come in the fasting state to undergo oral glucose tolerance test (OGTT). Hence, we undertook a study to elucidate a test that is casual and reliable to diagnose GDM. A total of 800 pregnant women underwent 75-g glucose challenge test (GCT) irrespective of the time of the last meal and their 2-h plasma glucose (PG) was estimated. They also underwent a 2-h 75-g OGTT recommended by WHO after 72 h. There was no statistically significant difference in the glycemic profile between GCT and WHO OGTT in the diagnosis of GDM. In conclusion, GCT

Introduction

Gestational diabetes mellitus (GDM) is defined as carbohydrate intolerance of variable severity with onset or first recognition during pregnancy [1]. GDM is not only associated with increasing pregnancy morbidity but also increases the likelihood of subsequent diabetes in the mother. As such GDM has implications beyond the index pregnancy, identifying two generations at risk of future diabetes [2]. Hence, detection and care of women with GDM becomes necessary in the strategy for the primary prevention of diabetes [3]. American Diabetes Association (ADA) recommends selective screening to detect GDM. This policy may not be applicable for population belonging to the ethnic group with high
This single test performed irrespective of the last meal timing is rational and patient friendly.

Compares well with the IADPSG test (no significant difference in pick up rates)

Seshiah V, Balaji V, Siddharth S, Shashank Joshi, AK Das, Sahay BK, et al. Diagnosis of gestational diabetes mellitus in the community. J Assoc Phys India,

FOGSI also supports this as it is validated and can be applied in all settings
WHO Observations and Recommendations - 2013

- For a pregnant woman, the request to attend fasting for a blood test may not be realistic because of the long travel distance to the clinic in many parts of the world, and increased tendency to nausea in the fasting state. Consequently non-fasting testing may be the only practical option.

- Considerations in testing for hyperglycaemia in pregnancy Feasibility
  - Laboratory glucose measurement is often not available and testing with a portable blood glucose meter is the only option.

Strategies for Implementing the WHO Diagnostic Criteria and Classification of Hyperglycaemia First Detected in Pregnancy - Ref - WHO/NMH/MND/13.2
GESTATIONAL DIABETES MELLITUS – Indian Guidelines

Seshiah V, Sahay BK, Das AK, Siddharth Shah, Samar Banerjee, Rao PV, Ammini A, Balaji V, Sunil Gupta, Hema Divakar, Sujata Misra, Uday Thanawala

Associated medical fraternity: Diabetes In Pregnancy Study Group India [DIPSII]
- V Seshiah (Chennai), A K Das (Puduchery), V Balaji (Chennai), Madhuri S Balaji (Chennai), Sunil Gupta (Nagpur), A Panneerselvam (Chennai), Anuj Maheshwari (Lucknow), Shyam Mukundan (Alwaye), Mary John (Ludhiana), Lilly Rodrigues (Hyderabad), Association of Physicians of India [API] - Siddharth N Shah (Mumbai), B K Sahay (Hyderabad), Muralidhar Rao (Gulbarga), N Rajendran (Chennai), Indian Medical Association [IMA] - Samar Bannerjee (Kolkata), A Bhavadharini (Erode), Federation of Obstetric & Gynecological Societies of India [FOGSI] – C N Purandare (Mumbai), Sanjay Gupte (Pune), Sujata Misra (Cuttack), Hema Divakar (Bengaluru), Uday Thanawala (Navi Mumbai), Ambarish Bhandiwad (Mysore), Cynthia Alexander (Chennai), Anjalakshi C (Chennai), Research Society for the Study of Diabetes in India [RSSDI] - K M Prasanna Kumar (Bangalore), P V Rao (Hyderabad), Iteendra Singh (Jammu), Manvir Patel.
• Importance of Standardization

Single, standard approach to upgrade Ob Gyn workforce will be more efficient, especially in semi urban and rural settings.

Uniformity of professional and community expectation is really important.

Time to follow INDIAN GUIDELINES.
Methodology:
Test for universal screening as per GOI guidelines

Single step testing using 75 g oral glucose & measuring plasma glucose 2 hour after ingestion.

75 g glucose is to be given orally with approximately 300 ml water whether the PW comes in fasting or non-fasting state, irrespective of the last meal. The intake of the solution has to be completed within 5 min.

A plasma standardized Glucometer should be used to evaluate blood glucose after 2 hours of oral glucose load.

If vomiting occurs within 30 min of oral glucose intake, the test has to be repeated the next day; if vomiting occurs after 30 mins, the test continues.

The Threshold plasma glucose level of ≥140 mg/dL is taken as cut off for diagnosis of GDM.
Universal Testing 75 gm OGTT

Universal GDM screening of pregnant women

Negative (90% of Pregnant women)

Positive (10% of Pregnant women)

1\textsuperscript{st} screening in first trimester

2\textsuperscript{nd} screening between 24-28 weeks

Easy procedure – no medical expertise required

Client friendly – irrespective of last-meal

No interference with routine - Done during routine antenatal check-ups

One step procedure for screening and diagnosis
FIGO recognizes that management of diabetes in pregnancy should be made in accord with available national resources and infrastructure, even without high quality evidence, as it is preferred to the alternative of no or poor care.

FIGO recommends and supports the call for greater attention and focus on the links between maternal health and non-communicable diseases as a developmental agenda.

On behalf of the HIP Working Group: Professor Moshe Hod (Chair), Dr Hema Divakar (Co-Chair)
### Alternative strategies as currently used in specified countries

<table>
<thead>
<tr>
<th>Country</th>
<th>At booking/first trimester</th>
<th>First test to detect diabetes in pregnancy</th>
<th>FPG values</th>
<th>Second test for confirmation of GDM</th>
</tr>
</thead>
<tbody>
<tr>
<td>China: Medium- to low-resource settings serving populations at high risk</td>
<td>All women</td>
<td>Measure FPG</td>
<td>&gt;7.0 mmol/L or &gt;126 mg/dL</td>
<td>If negative: perform 75-g 2-hour OGTT</td>
</tr>
<tr>
<td></td>
<td>24–28 weeks</td>
<td>Or To reduce number of OGTTs measure FPG. Only in women with values between 4.5 mmol/L and 5.0 mmol/L (81–90 mg/dL) perform 75-g 2-hour OGTT</td>
<td>Value &gt;5.1 mmol/L or &gt;92 mg/dL</td>
<td>2</td>
</tr>
<tr>
<td>Indian subcontinent: Medium- to low-resource settings serving rural/semi-urban/urban ethnic populations at high risk</td>
<td>All women</td>
<td>Measure fasting or nonfasting 2-hour value after 75-g OGTT</td>
<td>Reading between 7.8 and 11.0 mmol/L or 140 and 199 mg/dL indicates GDM</td>
<td>2</td>
</tr>
</tbody>
</table>

## Two hour plasma glucose

<table>
<thead>
<tr>
<th>Plasma glucose level</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;200 mg/dl</td>
<td>Diabetes</td>
</tr>
<tr>
<td>&gt;140-199 mg/dl</td>
<td>GDM</td>
</tr>
<tr>
<td>120-139 mg/dl</td>
<td>GGI</td>
</tr>
<tr>
<td>&lt;120 mg/dl</td>
<td>Normal</td>
</tr>
</tbody>
</table>
Universal testing of GDM

Pregnant Women in Community

Testing for GDM at 1st Antenatal visit (75gm oral glucose in 300 ml water, 2 hrs later plasma glucose value)

- Positive (2 hrs PG >140mg/dl)
  - Manage as GDM as per GOI guidelines

- Negative (2 hrs PG <140mg/dl)
  - Repeat Test at 24-28 week
    - Positive (2 hrs PG >140mg/dl)
      - Manage as GDM as per guidelines
    - Negative (2 hrs PG <140mg/dl)
      - Manage as Normal ANC
3 MILLION GDMs IDENTIFIED EVERY YEAR IN INDIA

WHEN EVERY ONE STARTS DOING THE TESTS

WHO WILL TAKE CARE?

ONLY 1000 DIABETOLOGISTS
MANAGEMENT OF GDM

IDEOALLY

A team approach is ideal for managing GDM.

an obstetrician,

diabetes physician,
a diabetes educator, dietitian,

Ultrasonologist

midwife and

pediatrician.
BARRIERS to PROVISION –
Once diagnosed – what next?

- **Dietecian** –
  - not available
  - varied diet across the country

- **Diabetologist** –
  - not enough numbers in all cities
  - And non existent in rural
Innovative ways to build capacities to offer alternatives

TRIUMPH
TO TRAIN OBGYNs
TO HANDLE THESE CASES

MULTITASK
 Developing a set of power point training slides by FIGO
 and used by master trainers in their presentations at training courses
involve other stakeholders

**TARGET GROUPS** for training and capacity building
- Specialists
- Postgraduates
- Medical officers
- Midwives/Nurses
- Other Health care providers
- Community health workers
Inform her about GDM and how it affects her and her baby (during and after pregnancy)

Ensure she understands the need to take care of herself and her baby during this pregnancy and after delivery during the postpartum period and later

Inform her why this pregnancy is different from others and why she needs extra care

Counsel pregnant women with GDM that she should continue diet control (MNT) and physical exercise during pregnancy and throughout the postpartum period.
How good should be the sugar control?

- The fetus in-utero should not come to know that the mother has diabetes! – *Prof Sunil Gupta; Nagpur*
- If maternal sugar well controlled then perinatal outcome like any normal pregnancy
- SMBS
- Ensure good control of Blood Sugar – Diet, Exercise, Drugs.

- Target Values – Fasting 90mg/dl; Post meal 2 hrs – 120mg/dl
Recommendations

- FIGO recognizes that nutrition counseling and physical activity are the primary tools in the management of GDM.
- FIGO recommends that women with GDM receive practical nutrition education and counseling that empowers them to choose the right quantity and quality of food.
- Women with GDM must be repeatedly advised to continue the same healthy eating habits after delivery to reduce the risk of future T2DM.

### Box 9

**Recommendations for nutrition therapy**

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Resource setting</th>
<th>Strength of recommendation and quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>We recommend that the following principles should be adhered for all pregnant women with diabetes:</td>
<td>All</td>
<td>1</td>
</tr>
<tr>
<td>• Design an appropriate diet with respect to prepregnancy BMI, desired body weight, physical activity, habits, and personal and cultural preferences.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Provide routine follow-up and diet adjustments throughout pregnancy to achieve and maintain treatment goals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Offer training, education, support, and follow-up by a qualified dietitian experienced in care of women with diabetes. Issues for discussion include: weight control, food records, carbohydrate counting, prevention of hypoglycemia, healthy foods, and physical activity.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>We suggest that caloric intake be calculated based on prepregnancy BMI and desirable weight gain as follows:</td>
<td>All</td>
<td>2</td>
</tr>
<tr>
<td>• 35–40 kcal/kg desirable body weight for underweight women</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 30–35 kcal/kg desirable body weight for normal weight women</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 25–30 kcal/kg desirable body weight for overweight women</td>
<td></td>
<td></td>
</tr>
<tr>
<td>We recommend limiting carbohydrate intake to 35%–45% of total calories, with a minimum of 175 g carbohydrate per day, distributed in three small-to-moderate sized meals and 2–4 snacks.</td>
<td>All</td>
<td>1</td>
</tr>
<tr>
<td>For obese women, caloric intake may be reduced by 30%, but not below 1600–1800 kcal/d</td>
<td>All</td>
<td>2</td>
</tr>
<tr>
<td>For women with diabetic nephropathy, protein may be lowered to 0.6–0.8 g/kg ideal body weight</td>
<td>All</td>
<td>2</td>
</tr>
</tbody>
</table>

Nutrition counselling and physical activity are KEY to reduce risk of future obesity, type 2 diabetes, and cardiovascular diseases.
Composition of lunch and dinner thali

- Half portion of thali should contain **vegetables** (cooked as well as in form of salad)
  - lettuce, broccoli, spinach, carrots, green beans, tomatoes, celery, cabbage, mushrooms

- One serving of dairy product
  - at least 1 ser-free yoghurt, curd or milk.

- One serving of fruit
  - guava, apple, berries or any citrus fruits during the day

- One fourth of thali should contain **cereals**
  - chapati, brown rice, bread, cereals

- One fourth of thali should contain **protein** rich foods
  - dal, soy nuggets, tofu, eggs, paneer, chicken, fish
### Box 10

**Recommendations for physical activity in women with gestational diabetes mellitus.**

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Resource setting</th>
<th>Strength of recommendation and quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>We suggest that appropriate, personally adapted, physical activity be recommended for all women with diabetes:</td>
<td>All</td>
<td>2</td>
</tr>
<tr>
<td>• Planned physical activity of 30 min/day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Brisk walking or arm exercises while seated in a chair for 10 min after each meal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Women physically active prior to pregnancy should be encouraged to continue their previous exercise routine.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Medical Therapy – Metformin

- If adequate control not achieved in reasonable time (1 to 2 weeks) -
- Offer metformin
- (NICE GUIDELINES 2015)
Add Insulin if-

- Blood glucose targets are not met with Diet + Exercise + Metformin
- If there are complications such as macrosomia or hydramnios (Diet + Exercise + /- Metformin)
- NICE 2015
Pharmacological management: If lifestyle modification alone fails to achieve glucose control, metformin, glyburide, or insulin should be considered as safe and effective treatment options for GDM.

Box 5
Recommendations for glucose monitoring in women with gestational diabetes mellitus.

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Resource setting</th>
<th>Strength of recommendation and quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-monitoring of blood glucose is recommended for all pregnant women with diabetes, 3–4 times a day:</td>
<td>All</td>
<td>2</td>
</tr>
<tr>
<td>• Fasting: once daily, following at least 8 hours of overnight fasting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Postprandial: 2–3 times daily, 1 or 2 hours after the onset of meals, rotating meals on different days of the week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-monitoring of blood glucose is recommended for all pregnant women with diabetes at least once daily, with documented relation to timing of meal</td>
<td>Low</td>
<td>2</td>
</tr>
</tbody>
</table>

Glycemic targets
Weight gain
Using the BMI chart and job-aid, based on the woman’s current nutrition status, explains the weight required to be gained during pregnancy.

<table>
<thead>
<tr>
<th>Weight status</th>
<th>Weight gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal weight</td>
<td>11.5-16 kg</td>
</tr>
<tr>
<td>Under weight</td>
<td>12.5 to 18 kg</td>
</tr>
<tr>
<td>Over weight</td>
<td>7 to 11.5 kg</td>
</tr>
<tr>
<td>Obese</td>
<td>5-9 kg</td>
</tr>
</tbody>
</table>
Obstetric Management

- Antenatal visits
- Scans
- Tests for fetal well being
- Decision for time and mode of delivery
- Postnatal care and follow up
Evaluation in first trimester

- Hb A1c - HbA1c & congenital anomalies
  
<table>
<thead>
<tr>
<th>Hba1c level</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>till 6.5%</td>
<td>not increased</td>
</tr>
<tr>
<td>&lt;8%</td>
<td>5%</td>
</tr>
<tr>
<td>&gt;10%</td>
<td>25%</td>
</tr>
</tbody>
</table>

- Scan for viability at 7 weeks – dating
- Anomaly Scan at 11-13 weeks- nuchal Thickness and cardiac evaluation
- Increase risk of congenital abnormalities like sacral agenesis, congenital heart disease, & neural tube defects
- Uterine artery doppler – Screen for future PIH (aspirin)
- Double marker test (if Positive NIPT/ CVS)
First trimester maternal serum free b-human chorionic gonadotropin and pregnancy-associated plasma protein A in pregnancies complicated by diabetes mellitus

MD Savvidou,a,b A Syngelaki,b M Muhaisen,b E Emelyanenko,b KH Nicolaidesb,c  Academic Department of Obstetrics and Gynaecology, Imperial College School of Medicine, London, UK Accepted 14 November 2011

- Maternal median PAPP-A in type-2 diabetes, compared with the non-diabetic group, was reduced (0.75 MoM, IQR 0.50–1.09 MoM versus 1.00 MoM, IQR 0.68–1.42 MoM; P < 0.001), which resulted in doubling in the false-positive rate in the combined screening in this population.
Second trimester - Fetal Structural assessment & Growth by USG

- Anomaly scan at 18-20 weeks
- *Fetal ECHO is mandatory*
- 4 weekly scans from 28 weeks - AC / liquour - use growth charts to pick up Growth restriction or Macrosomia
Ante-partum testing

- Type & frequency of antenatal testing should be determined by the severity of maternal hyperglycemia or presence of other adverse clinical factors.

- NSTs should be “considered” after 32 weeks’ gestation in women on insulin and “at or near” term in those who are diet controlled.

- BPP & Doppler to assess umbilical blood flow “may be considered” if there is excessive or poor growth.

- AFI may be misleading.
Complications in the fetus

Maternal excess circulating glucose, lipids, amino acids

- Fetal substrates transfer
- Fetal hyperinsulinemia
- Fetal substrate uptake

- Macrosomia
- Lung surfactant synthesis

- Hypoxia
- Altered oxygen delivery

- Erythropoietin

- Stillbirth, perinatal asphyxia
- Polycythemia
- Hyperbilirubinemia

- Myocardopathy
- Respiratory distress syndrome
In SGA - Doppler is a good surveillance tool to judge and predict the turning point at which the decreased perfusion–adapted fetus decompensates and delivery is necessary.

In contrast, for LGA fetuses, with which the placenta is usually large as well, there is an increased blood flow present, and the wave curve is normal, such that the usual perfusion indexes fail to predict placental insufficiency.

Fetal Well Being

Recommendations for fetal well-being surveillance in women with gestational diabetes mellitus.

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Resource setting</th>
<th>Strength of recommendation and quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use cardiotocography and/or biophysical profile or kick-count as indicated</td>
<td>All</td>
<td>1C000</td>
</tr>
<tr>
<td>according to local protocol</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Maternal monitoring

- Frequent ANC visits –

- Watch for Hypertension / other maternal problems – retinopathy / renal function

- Watch for Pregnancy complications – Hydroamnios, Growth abnormalities
Prematurity - MANAGEMENT OF STEROID PULSES

- Admit ?

- I.M Betamethasone is administered in 2 doses of 12 mg, 12 hours apart OR IM Dexamethasone is administered in 4 doses of 6 mg 6 hours apart

- For patients on subcutaneous insulin increase all insulin doses by 50% 6 to 8 hours after the first dose of steroids

- Maintain this increase until 12 hours after the second dose of Betamethasone or the forth dose of Dexamethasone then revert back to usual insulin doses

- Tayside Diabetes MCN Handbook
Delivery before full term is not indicated unless there is evidence of
- macrosomia,
- ployhydramnios,
- poor metabolic control or
- other obstetric indications (eg pre-elampsia or intrauterine growth retardation)

NICE guidelines say that delivery should be offered at 38 weeks.
Gestational diabetes diagnosis at 24 to 28 weeks of gestation

Counseling, glucose monitoring, nutritional therapy, insulin or oral anti-hyperglycemic drugs (if needed)

Uncomplicated pregnancy, euglycemic on nutritional therapy alone

Ultrasound to estimate fetal weight at 37 to 39 weeks

Estimated fetal weight ≥4500 grams

Counsel* and offer scheduled cesarean delivery at 39 weeks

Estimated fetal weight <4500 grams

Counsel* and offer a trial of labor

Expectant management until 41 weeks. Induce labor at that time.

Uncomplicated pregnancy, poor glucose control on nutritional therapy or using insulin or oral anti-hyperglycemic drugs

Begin twice weekly antenatal fetal monitoring at 32 weeks of gestation (nonstress test with amniotic fluid index)

Ultrasound to estimate fetal weight at 37 to 39 weeks

Estimated fetal weight ≥4500 grams

Counsel* and offer scheduled cesarean delivery at 39 weeks

Estimated fetal weight <4500 grams

Counsel* and offer induction of labor at 39 weeks
What investigations help in preventing still births in a diabetic?

- NONE ! – Cause of still birth uncertain
- Relative fetal hypoxia, which increases the risk of intrauterine fetal death.
- Other possible causes -
  - Placental vasculopathy
  - Villous edema
  - Maternal ketacidosis-20-50%
  - Electrolyte disturbances
  - Fetal hypertrophic cardiomyopathy

(Girz BA et al. J Perinatol 1992;12:229-33)
MODE OF DELIVERY

GDM is not an indication for LSCS
Indivisualize
POST PARTUM FOLLOW UP –
The Unfinished Agenda

**POSTPARTUM AIMS**

- **Early DETECTION** of infections
- **SUPPORT** of breastfeeding
- **ADVICE** on pregnancy spacing
- **RETEST** all women with GDM at 6-12 weeks postpartum
- Future **blood glucose TESTS**
Individual Barriers to Post partum Screening

- Lack of time - burden of child care, baby’s health issues, adjustment to the new baby
- Not informed about post partum test
- Emotional stress, feeling overwhelmed
- Cost, dependence, transportation
- Lost requisition, or move to parental home for delivery
- Feeling healthy and not in need for care, or fear of receiving bad news
- Poor delivery experience, dissatisfaction with care and logistics of accessing care and lack of trust in HCP
FIGO encourages obstetricians to establish connections with family physicians, internists, pediatricians, and other healthcare providers to support postpartum follow-up of GDM mothers linked to the regular check-up and vaccination program of the child to ensure continued engagement of the high-risk mother-child pair.

A sticker like this could alert the nurse/pediatrician that the child is Off spring of GDM Mother and this could initiate a brief discussion on lifestyle, weight and reminder for follow up.
Thank You
- FIGO supports the concept that the postpartum period in women with GDM provides an important platform to initiate early preventive health for both the mother and the child who are both at a heightened risk for future obesity, metabolic syndrome, diabetes, hypertension, and cardiovascular disorders.

- FIGO encourages obstetricians to establish connections with family physicians, internists, pediatricians, and other healthcare providers to support postpartum follow-up of GDM mothers linked to the regular check-up and vaccination program of the child to ensure continued engagement of the high-risk mother-child pair.

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PREGNANCY OFFERS A WINDOW OF OPPORTUNITY TO:

→ Establish services
→ Improve health
→ Prevent intergenerational transmission of non-communicable diseases

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POSTPARTUM AIMS

- Early DETECTION of infections
- SUPPORT of breastfeeding
- ADVICE on pregnancy spacing
- RETEST all women with GDM at 6-12 weeks postpartum
- Future blood glucose TESTS

---

A sticker like this could alert the nurse/pediatrician that the child is offspring of GDM Mother and this could initiate a brief discussion on lifestyle, weight and reminder for follow up.
Links between maternal health and NCD prevention – the health economic arguments

From HIP (Hyperglycemia in Pregnancy) to prevention of DAP (Diabetes after Pregnancy)

Life course approach to management, prediction and prevention of NCD – Mother and Offspring
Thank You
Complications on the fetus –

First trimester - Malformations; fetal wastage

Second Trimester - Hypertrophic cardiomyopathy; polyhydromnios Prematurity

Third Trimester - Macrosomia IUGR; IUD

Neonatal Problems - Birth Injuries; Metabolic disturbances; RDS, polycythemia hyperbilirubinemia
One step 75gm non fasting - Advantages

- 3times more pick up than with two step
- Suitable for Indian setting
- Saves time
- Saves cost
- Avoids repeated visits
- Reduces repeated invasive sampling
Indian Guidelines – DIPSI

- Universal Screening
- Screening in each trimester

- Early screening – to pick up undiagnosed preexisting diabetes (HbA1c >6)
- Early Screening - In patients with High Risk factors
- Repeat at 24-28 weeks
- Also around 32-34 weeks

- Test suggested by DIPSI, most pragmatic in Indian Settings
Point of care testing

Testing time is more in laboratories, which results in number of women leaving community health centres before diagnosis established.

Point of care testing will have a transformative effect on health care
Testing for GDM is recommended twice during ANC.

The first testing should be done during first antenatal contact as early as possible in pregnancy.

The second testing should be done during 24-28 weeks of pregnancy if the first test is negative.

There should be at least 4 weeks gap between the two tests.

The test is to be conducted for all PW even if she comes late in pregnancy for ANC at the time of first contact.

If she presents beyond 28 weeks of pregnancy, only one test is to be done at the first point of contact.
Starting dose: 4 units before breakfast

Every 4th day increase 2 units till 10 units

If FPG remains > 90 mg/dl and 2hr PG > 120mg/dl advised → 6 units of regular insulin before breakfast & 6 units of premixed insulin before dinner

Review with blood sugar test → Adjust dose further

Total insulin dose per day can be divided as 2/3 in the morning & 1/3 in the evening

* Initially if post breakfast plasma glucose is high → Start Premix 50/50