, visit our website www.jaypeebrothers.com, for detailed information on obstetrics & gynecology books, visit our website www.jaypeebrothers

Volume 2

Dr Malhotra's Series

FAQs on Stem Cell, Urogynecology and Gestational Diabetes

Series Editor
Jaideep Malhotra

Editors
Ajay Rane
Apoorva Pallam Reddy
Keshav Malhotra
Narendra Malhotra
Neharika Malhotra Bora

JAYPEE

Contents

Chapter 1 FAQs on Stem Cell Cord Blood Banking **1**
Keshav Malhotra, Neharika Malhotra Bora

Chapter 2 101 FAQs in Urogynecology **16**
Ajay Rane

Urinary Incontinence 16
Assessment 17
Diagnosis 17
Investigations 17
Treatment 17
Trouble Shooting 18
Prolapse 19
Assessment 19
Diagnosis 20
Treatment 20
Trouble Shooting 21
Anatomy and Physiology 22
Fistula 24
Pregnancy 26
3rd/4th Degree Tears 26
Recurrent Urinary Tract Infections (UTIs) 29
Interstitial Cystitis 30
Medical Disorders 31
Menopause 32
Mesh in Urogynecology 32
Female Genital Cosmetic Surgery 34

Chapter 3 FAQs for Doctors on GDM **35**
Apoorva Pallam Reddy

Basic 35
Screening 41
Diagnosis 42
Effects of GDM on Pregnancy 49
Management of Pregnancy with GDM 55
Complications of GDM in Pregnancy 58

Risk Factors for Progression of DR 59
Managing Delivery 73
Management of Fetus 77
Contraception 82

Appendix *85*
Index *91*

3 CHAPTER

FAQs for Doctors on GDM

Apoorva Pallam Reddy

JAYPEE BROTHERS

BASIC

Q. 1. What is diabetes mellitus?

Diabetes mellitus is a group of metabolic diseases characterized by phenotype of hyperglycemia resulting from defects in insulin secretion, insulin action, or both. India is the diabetic capital of the world with approximately 150 million affected worldwide.

Classification of diabetes

DM is classified on the basis of the pathogenic process that leads to hyperglycemia. The two broad categories of DM are designated type 1 and type 2. Both types of diabetes are preceded by a phase of abnormal glucose homeostasis as the pathogenic processes progress.

Type 1 diabetes mellitus	Immune-mediated DM (cell-mediated immune destruction of beta cells of pancreas)
	Idiopathic DM (forms of the disease with no known etiology)
Type 2 diabetes mellitus	Relative rather than absolute insulin deficiency
Impaired glucose homeostasis	Impaired fasting glucose (fasting glucose higher than normal, but less than diagnostic)
	Impaired glucose tolerance (plasma glucose following a 75 g challenge higher than normal, but less than diagnostic)
Gestational diabetes mellitus	Glucose intolerance in pregnancy
Other specific types DM due to specific etiologies	• Genetic defects of beta cell function (MODY 1, 2, 3)
	• Genetic defects of insulin action
	• Disease of exocrine pancreas (pancreatitis, cystic fibrosis)

Contd...

Contd...

	• Endocrine (Cushing's)
	• Drug or chemical induced
	• Infection (rubella, coxsackie, cytomegalovirus)
	• Uncommon forms of immune-related diabetes
	• Other genetic syndromes

Diagnosis of diabetes

The diagnosis of diabetes in non-pregnant subjects is made on the finding of elevated fasting blood glucose and/or elevated blood glucose following an oral glucose challenge.

	Fasting Plasma Glucose		*2-h Plasma Glucose*
Impaired fasting glucose	110–125 mg/dl		
Impaired glucose tolerance	≤126 mg/dl	And	140–200 mg/dl
Diabetes	≥126 mg/dl	Or	≥200 mg/dl

Q. 2. What is gestational diabetes?

Gestational diabetes refers to "Carbohydrate intolerance of variable severity with onset or first recognition during the pregnancy. The definition applies irrespective of whether or not insulin is used for the treatment or the condition persists after pregnancy".

Pregnancy causes a physiologic increase in insulin resistance in maternal tissues, presumably to satisfy the nutritional demands of the fetus. It is essential to differentiate patients with exaggerated carbohydrate intolerance in pregnancy and those with pre-existing Diabetes mellitus.

Significance: Diabetes is associated with both microvascular and macrovascular disease. Microvascular disease leads to retinopathy, nephropathy, and neuropathy, whereas accelerated atherosclerosis of large vessels predisposes to myocardial infarction, stroke and limb ischemia.

It effects adversely all the phases of pregnancy. Hence early diagnosis and appropriate management significantly decreases the associated morbidity.

Q. 3. What is insulin resistance?

Insulin is an anabolic hormone produced by the beta-cells of pancreas in response to glucose in blood stream.

Insulin releases in two phases → Rapid release
Insulin releases in two phases → Sustained basal release

JAYPEE BROTHERS

It acts on three tissues for glucose utilization

Skeletal muscles	→	Utilization of glucose for energy production
Liver	→	Stores glucose as glycogen
Adipose tissue	→	Storage as triglycerides (Fat)

Any decreased response to insulin action is referred to as insulin resistance.

Q. 4. How does insulin resistance vary in pregnancy

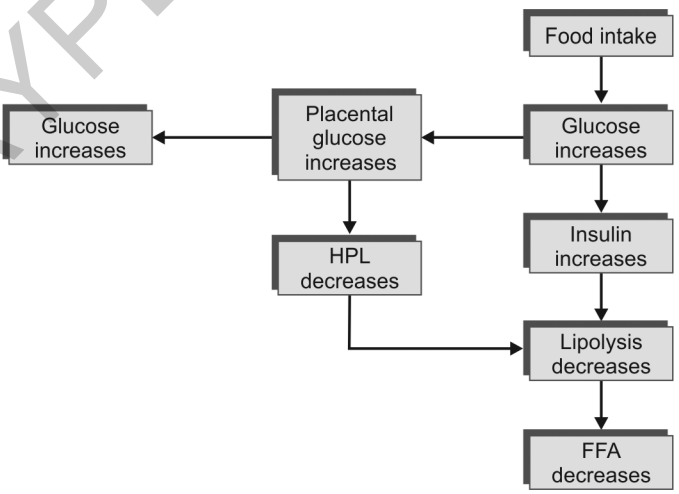
Insulin resistance, to certain degree, is physiological in pregnancy.

Mechanism: It is mediated by the various hormones of pregnancy like human placental lactogen, cortisol, progesterone among others. The mechanism for the insulin antagonism by hPL may be the hPL-stimulated increase in free fatty acid levels, which, in turn, directly interfere with insulin-directed entry of glucose into cells. Insulin resistance also changes in direct correlation with that of plasma hPL levels. The peak hPL levels seen at 32–36 weeks correlate with maximum insulin resistance observed.

Importance: Due to insulin resistance, the circulating levels of glucose are increased in the mother. This phenomenon is to conserve the glucose utilization by the mother, and thus increase the supply of free glucose to the fetus.

Q. 5. What is hPL?

Human placental lactogen (hPL) also called human chorionic somatomammotropin, is secreted by the syncytiotrophoblast. The level of hPL in the maternal circulation is correlated with fetal and placental weight, steadily increasing until plateauing in the last 4 weeks of pregnancy. In the mother, hPL stimulates insulin secretion and IGF-I production and induces insulin resistance and carbohydrate intolerance.



JAYPEE BROTHERS

Q. 6. What are the risk factors for GDM?

Risk factors associated with GDM

- Maternal age
- Family history of type 2 DM
- Non white ethnic origin
- Obesity
- Smoking
- Increased weight gain in early childhood
- Polycystic ovary syndrome
- Previous large infant > 95th percentile
- Previous unexplained still birth
- Glucosuria
- H/O congenital anomaly
- H/O prematurity
- Polyhydramnios
- H/O GDM in previous pregnancy
- H/O unexplained neonatal death

Q. 7. What is Glycation? What is Glycosylation?

All blood sugars are reducing molecules. **Glycation** is covalent bonding of a protein or lipid molecule with a sugar molecule, such as fructose or glucose, without the controlling action of an enzyme. Enzyme-controlled addition of sugars to protein or lipid molecules is termed glycosylation.

Glycation is a haphazard process that impairs the functioning of biomolecules, whereas glycosylation occurs at defined sites on the target molecule and is required in order for the molecule to function.

Endogenous glycations occur in the bloodstream to a small proportion and leads to production of advanced glycation endproducts (AGEs)) such as hydrogen peroxide. Most AGEs are implicated in many age-related chronic diseases such as cardiovascular diseases (the endothelium, fibrinogen, and collagen are damaged), Alzheimer's disease, beta cells (insulin-producing) in the pancreas are also at high risk of damage. Damage by glycation results in stiffening of the collagen in the blood vessel walls, leading to high blood pressure, especially in diabetes.

Red blood cells have a consistent lifespan of 120 days and are easily accessible for measurement of recent increased presence of glycating product. This fact is used in monitoring blood sugar control in diabetes by monitoring the glycated hemoglobin level, also known as HbA1c. Hence elevated HbA1c values are detrimental to the developing embryo as it represents elevated oxidative stress.

Q. 8. What is HbA1c

Glycated hemoglobin is the Hb formed in a non-enzymatic glycation pathway by hemoglobin's exposure to plasma glucose. As the average amount of

JAYPEE BROTHERS

plasma glucose increases, the fraction of glycated hemoglobin increases in a predictable way. This serves as a marker for average blood glucose levels over the previous months prior to the measurement.

Normal levels of glucose keep HbA1c in the range of. HbA1c should be less than 6.5 before pregnancy as raised levels of HbA1c are associated with higher incidence of congenital malformations.

In diabetes mellitus, higher amounts of glycated hemoglobin, indicating poorer control of blood glucose levels, have been associated with cardiovascular disease, nephropathy, and retinopathy.

Once a hemoglobin molecule is glycated, it remains so till it's destruction. A buildup of glycated hemoglobin within the red cell, therefore, reflects the average level of glucose to which the cell has been exposed during its life-cycle, i.e. HbA1c reflects the glycemic control over the past 3 months (120 days). Measuring glycated hemoglobin assesses the effectiveness of therapy by monitoring long-term serum glucose regulation. The HbA1c level is proportional to average blood glucose concentration over the previous 4 weeks to 3 months. Some researchers state that the major proportion of its value is weighted toward the most recent 2–4 weeks. This is also supported by the data from actual practice showing that HbA1c level improved significantly already after 20 days since glucose-lowering treatment intensification.

Q. 9. What is the target HbA1c level?

HbA1c should be ideally 6.5 before conception. If values are above eight termination of pregnancy should be given as an option and parents counseled for increased risk of congenital anomalies.

Q. 10. What is Fructosamine?

Fructosamines are compounds that result from glycation reactions between a sugar (such as fructose or glucose) and a primary amine. It calculates the fraction of total serum proteins that have undergone glycation. Since albumin is the most common protein in blood, fructosamine levels typically reflect albumin glycation. Because albumin has a half-life of approximately 20 days, the plasma fructosamine concentration reflects relatively recent (1–2 weeks) changes in blood glucose. In patients with diseases that reduce red blood cell lifespan, such as hemolytic anaemia or hemoglobinopathies such as sickle-cell disease, a hemoglobin-based A1c test can be misleadingly low.

$$\text{HbA1c} = 0.017 \times \text{Fructosamine} + 1.61$$

Q. 11. What is DAFNE?

DAFNE (Dose Adjustment for Normal Eating) is a group program designed for adults with type 1 diabetes. DAFNE equips participants with strategies to self-manage their insulin doses, exercise, illness and alcohol more safely. The program covers topics such as carbohydrate estimation, insulin adjustment, blood glucose monitoring, hypoglycemia, illness and exercise. DAFNE

JAYPEE BROTHERS

is a way of managing Type 1 diabetes and provides people with the skills necessary to estimate the carbohydrate in each meal and to inject the right dose of insulin.

There are websites that contain up-to-date information on DAFNE for both people living with Type 1 diabetes, healthcare professionals and commissioners.

The program has been proven in both Australia and the United Kingdom to:

- Improve HbA1c
- Reduce occurrence of severe hypoglycemia
- Increase dietary freedom
- Improve quality of life

The program involves attending a 5-day course under the supervision of a trained diabetes educator. For eligibility, participants must

- Have had type 1 diabetes for more than 6 months
- Be at least 18 years of age
- Not be on an insulin pump
- Be willing to inject, test and record blood glucose levels at least 4–5 times per day
- Be able to attend all 5 days of the program, from 9 am to 5 pm each day for one full week
- Be motivated to learn and trial new insulin adjustment strategies, and improve diabetes management.

Q. 12. What hormones increase insulin resistance

Hormones responsible for insulin resistance and hyperinsulinemia in pregnancy

Estrogen

1. Increase insulin levels
2. Increase insulin binding

Progesterone

1. Increase insulin response to glucose challenge.
2. Decrease maximum glucose transport.
3. Decrease ability of insulin to suppress endogenous production of glucose.
4. Decrease glucose insulin receptor number.
5. Causes post receptor defect.

Cortisol: In late pregnancy maternal concentration of cortisol is 2–5 folds high. It induces insulin resistance by post receptor mechanism. It increase hepatic glucose production rate. It promotes lipolysis and protein breakdown cause increase FFA and amino acid levels.

Human placental lactogen

- Suggested as primary hormone responsible for insulin resistance.
- It increases with advancing gestation.
- Decreases maximum glucose transport.
- It directly stimulates insulin secretion from islet cells.
- It acts through cell surface receptors. Stimulates IGF-I production.

JAYPEE BROTHERS

Prolactin

- Levels increase 5–10 folds in pregnancy.
- Basal insulin concentration and post challenge glucose and insulin response were greater in women with hyperprolactinemia.
- Decrease maximum glucose transport.

Placental growth hormone (GH): There are increased levels of GH secreted by placenta. Its action is similar to native GH. It increases lipolysis. Shows anti-insulin action:

1. There is no significant decrease in insulin receptor binding in normal and GDM pregnancy. Insulin resistance in pregnancy in possibly tissue specific and related to post-receptor events that are multifactorial, but are exerted at the β subunit of the insulin receptor and IRS-1.

SCREENING

Q. 13. Whom to screen?

The purpose of a screening test is not to diagnose a disease, but to identify a subgroup of a given population that is at risk for a given disorder. Universal screening is the norm for GDM in view of dynamic changes of glucose metabolism in pregnancy. For many patients antenatal period might serve as an opportunity to detect pre-existing diabetes.

Q. 14. What are the tests for screening?

To maximize the utility of a screening test, a screening test should be well defined, easily administered and reproducible and it should optimize sensitivity, perhaps at the expense of some specificity.

- Historic risk factors
- Random glucose sampling screening
- Fasting blood glucose
- Glycosuria
- Oral glucose challenge test
- 75 g 2 hours OGTT as one step measure
- Intravenous glucose tolerance test
- Glycosylated blood proteins-HbA1C
- Fructosamine assay.

Q. 15. When to screen?

The assessment of risk factors for development of GDM should be done at the first antenatal visit. They can be classified as: 1. Low risk, 2. Average risk, 3. High risk

Low risk

- Member of an ethnic group with low prevalence of GDM
- No known first degree relative with diabetes
- Age < 25 years

JAYPEE BROTHERS

- Weight normal before pregnancy
- Weight normal at birth
- No h/o abnormal glucose metabolism.

Average risk

- Member of an ethnic group with high prevalence of GDM
- Diabetes in a first degree relative
- Age >25 years
- Over weight before pregnancy
- Weight high at birth.

High risk

- Marked obesity
- Previous h/o GDM, impaired glucose tolerance or glucosuria.

Q. 16. Should we repeat a normal test?

A normal oral glucose challenge test (OGCT) in the first trimester should be followed with a repeat testing between 28–32 as the insulin resistance is at its peak during this time. This helps in not missing a late onset cases which can effect as adversely as the early onset cases.

DIAGNOSIS

Q. 17. What tests are used to diagnose GDM?

The lack of international uniformity in the approach to ascertainment and diagnosis of GDM has been a major hurdle.

	NDDG (*Plasma*)	*Carpenter and Coustan* (*Whole blood*)	*Carpenter and Coustan* (*Plasma*)	*O'Sullivan* (*Whole blood*)
Fasting	105 mg/dl	80 mg/dl	95 mg/dl	90 mg/dl
1 hour	190 mg/dl	155 mg/dl	180 mg/dl	165 mg/dl
2 hours	165 mg/dl	130 mg/dl	155 mg/dl	145 mg/dl
3 hours	145 mg/dl	120 mg/dl	140 mg/dl	125 mg/dl

Q. 18. When to get a diagnostic test?

Women at "high risk" of GDM (**one** high risk factor or **two** moderate risk factors) should undergo a 75 g glucose OGTT, with venous plasma samples taken fasting, 1 hour and 2 hours at the first opportunity after conception. Women considered as moderate or high risk but with normal early pregnancy glucose testing should have a repeat POGTT at the usual time of 24–28 weeks' gestation.

Q. 19. What is OGCT?

To improve on the sensitivity of screening test by history taking O'Sullivan and coworkers evaluated the use of 50 g. 1 hour glucose challenge test in which threshold of 130 mg/dl was found to be 79% sensitive and 87% specific for

JAYPEE BROTHERS

gestational diabetes mellitus in a cohort of 752 women. This study was unique in the sense that all subjects under went the full glucose tolerance test, so that complete ascertainment of the condition in the population was possible.

Positive predictive value of the test ranged from 9–24%. As O'Sullivan used Somogyi-Nelson method and presently hexokinase test is widely used, the threshold of 130 mg/dl will be translated to 142 mg/dl. The threshold for abnormality in screening for GDM is an important factor for determining the sensitivity and cost of screening programme.

Q. 20. What is OGTT?

Oral glucose tolerance test. Diagnosis of GDM is mainly by OGTT, but similar to many diabetic investigations, there are a lot of controversies regarding which OGTT to use and which cut off to follow.

In the US the diagnostic criteria most commonly used are based on the work of O"Sullivan and Mahan. They administered 100 g and did 3 hour OGTT.

But the cut off values given were based on whole blood instead of plasma or serum.

So NDDG revised the cut off by adding 14 and rounding it up.

It was endorsed by both ADA and ACOG the NDDG recommendations for test performance are as follows:

1. The test should be done in the morning.
2. An unrestricted diet including at least 150 g of carbohydrate should be ingested daily for 3 days preceding the test.
3. Patients should fast for 10–16 hours before test.
4. Patients should be seated during the test and not smoking.

But NDDG did not take into consideration the change in test method, which had now changed to hexokinase method. So Carpenter and Coustan subtracted 5 mg/dl from Sullivan et al original rounded criteria and multiplied this value by a factor of 1.14 and then rounded it to the nearest 5 mg/dl.

Q. 21. What is WHO guidelines?

The 1999 report Definition, Diagnosis and Classification of Diabetes Mellitus and its Complications is the most recent WHO report addressing the classification and diagnosis of gestational diabetes. This report stated:

- Gestational diabetes is a carbohydrate intolerance resulting in hyperglycemia of variable severity with onset or first recognition during pregnancy.
- In the early part of pregnancy (e.g. first trimester and first half of second trimester) fasting and postprandial glucose concentrations are normally lower than in normal, non-pregnant women. Elevated fasting or postprandial plasma glucose levels at this time in pregnancy may well reflect the presence of diabetes which has antedated pregnancy, but criteria for designating abnormally high glucose concentrations at this time have not yet been established.

JAYPEE BROTHERS

- Formal systematic testing for gestational diabetes is usually done between 24 and 28 weeks of gestation.
- To determine if gestational diabetes is present in pregnant women, a standard OGTT should be performed after overnight fasting (8–14 hours) by giving 75 g anhydrous glucose in 250–300 ml water. Plasma glucose is measured fasting and after 2 hours. Pregnant women who meet WHO criteria for diabetes mellitus or impaired glucose tolerance (IGT) are classified as having GDM. After the pregnancy ends, the woman should be re-classified as having either diabetes mellitus, or IGT, or normal glucose tolerance based on the results of a 75 g OGTT 6 weeks or more after delivery. The significance of impaired fasting glycemia (IFG) in pregnancy remains to be established. Any woman with IFG, however, should have a 75 g OGTT.

Organization	*Fasting plasma glucose*	*Glucose challenge*	*1-h plasma glucose*	*2-h plasma glucose*	*3-h plasma glucose*
WHO 1999*	≥ 7.0	75 g OGTT	Not required	≥ 7.8	Not required
American Congress of Obstetricians and Gynecologists**	≥ 5.3	100 g OGTT	≥ 10.0	≥ 8.6	≥ 7.8
Canadian Diabetes Association	≥ 5.3	75 g OGTT	≥ 10.6	≥ 8.9	Not required
IADPSG	≥ 5.1	75 g OGTT	≥ 10.0	≥ 8.5	Not required

*one value is sufficient for diagnosis
**two or more values are required for diagnosis

In 2010, the WHO convened an expert group to review the current WHO recommendations on definition, diagnosis and classification of glucose intolerance in pregnancy. **The strength of recommendations is stated only for recommendations arrived at by the GRADE process.**

Strong: Moderate or high quality evidence of effectiveness for at least one critical outcome, desirable effects judged to outbalance the undesirable, or very low quality evidence on undesirable effects; can be adopted in most settings.

Weak/conditional: Low or very low quality evidence of effectiveness for all critical outcomes, small benefits, or harms judged to dominate over benefits; questionable feasibility in low-resource settings.

Recommendation 1

Hyperglycemia first detected at any time during pregnancy should be classified as either:

- Diabetes mellitus in pregnancy
- Gestational diabetes mellitus

JAYPEE BROTHERS

Quality of evidence: not graded

Strength of recommendation: not evaluated

Recommendation 2

Diabetes mellitus in pregnancy should be diagnosed by the 2006 WHO criteria for diabetes if one or more of the following criteria are met:

- Fasting plasma glucose ≥7.0 mmol/L (126 mg/dl)
- 2-hour plasma glucose ≥11.1 mmol/L (200 mg/dl) following a 75 g oral glucose load
- Random plasma glucose ≥ 11.1 mmol/L (200 mg/dl) in the presence of diabetes symptoms.

Quality of evidence: not graded

Strength of recommendation: not evaluated.

Recommendation 3

The diagnosis of gestational diabetes mellitus at any time during pregnancy should be based on any one of the following values:

- Fasting plasma glucose = 5.1–6.9 mmol/l (92–125 mg/dl)
- 1-h post 75g oral glucose load ≥ 10.0 mmol/L (180 mg/dl)
- 2-h post 75g oral glucose load 8.5–11.0 mmol/L (153-199 mg/dl)

The GDG considered that the method proposed by IADPSG (risk level of 1.75) was appropriate and rather than further complicate the current situation by proposing another new set of criteria, it was advisable to adopt the same methodology for setting diagnostic cut-points. The difference from IADPSG guidelines is that these new WHO guidelines set a range of plasma glucose levels to distinguish diabetes in pregnancy and GDM.

Q. 22. What is new in these diagnostic criteria for diabetes in pregnancy?

These diagnostic criteria for diabetes are universally accepted in non-pregnant individuals, but pregnant women with these cut-off values were classified as having GDM when first detected during pregnancy.

Q. 23. Why need new criterion for diagnosis?

The classic O'Sullivan criteria were based on blood glucose values from an index pregnancy among women who subsequently developed diabetes later in life. The glucose testing method at that time was the Somogyi-Nelson method, which utilized whole blood. In addition to glucose, the Somogyi-Nelsonal measured some other non-specific reducing sugars in the blood. The O'Sullivan criteria were later refined by Carpenter and Coustan to reflect the current use of enzymatic methods, which measured glucose alone. Hence the two main criteria used in North America are based on women who subsequently developed glucose intolerance later in life, and the current O'Sullivan-based criteria do not screen for either obstetric or neonatal outcomes.

JAYPEE BROTHERS

The drawback of ADA criteria is that it permits both 100 g and 75 g OGTT. Though the glucose loads are different, the cut-off value is the same. Further the 3 hour value for 75 g OGTT is not given at all. Though the criteria are still followed in USA they are used little elsewhere.

Murphy N. First evidence-based criteria for diagnosis of gestational diabetes (Southcentral Foundation and Alaska Native Medical Center). 2010;35(9).

Q. 24. What is the ADA criterion?

The American Diabetes Association (ADA) has adopted the IADPSG recommendation since December 2010, while the American College of Obstetricians and Gynecologists advises to continue with the two-step screening strategy (universal screening with a 50 g glucose challenge test (GCT), followed by a 3-h 100 g OGTT only when the GCT is abnormal)

In March 2013 an independent expert panel, appointed by the National Institute of Health, recommended that the two-step approach be continued. The panel is particularly concerned that the adoption of the IADPSG criteria would increase the prevalence of GDM, and the corresponding costs and interventions, without clear demonstration of improvements in the most clinically important health and patient-centered outcomes.

Benhalima K, Crombrugge PV, Devlieger R, Benhalima, et al. Diabetology and Metabolic Syndrome. 2013;5:66.

Q. 25. What are RCOG guidelines?

RCOG recommends screening for gestational diabetes using risk factors in a healthy population. At the booking appointment, the following risk factors for gestational diabetes should be determined:

- Body mass index above 30 kg/m^2
- Previous macrosomic baby weighing 4.5 kg or above
- Previous gestational diabetes
- Family history of diabetes (first-degree relative with diabetes)
- Family origin with a high prevalence of diabetes
  - South Asian (specifically women whose country of family origin is India, Pakistan or Bangladesh)
  - Black Caribbean
  - Middle Eastern (specifically women whose country of family origin is Saudi Arabia,

United Arab Emirates, Iraq, Jordan, Syria, Oman, Qatar, Kuwait, Lebanon or Egypt).

Women with any one of these risk factors should be offered testing for gestational diabetes with OGCT. Screening for gestational diabetes using fasting plasma glucose, random blood glucose, glucose challenge test and urinalysis for glucose should not be undertaken.*

The 2 hours 75 g oral glucose tolerance test (OGTT) should be used to test for gestational diabetes and diagnosis made using the criteria defined by the

JAYPEE BROTHERS

detailed information on obstetrics & gynecology books, visit our website www.jaypeebrothers.com, for detailed information on obstetrics & gyn

Dr Malhotra's Series

FAQs on Stem Cell, Urogynecology and Gestational Diabetes

Salient Features

- A valuable and user-friendly handbook
- Focuses on the three important aspects of women's health: stem cells, urogynecology and gestational diabetes
- Deals with the issues in all the possible aspects
- Provides 100 frequently asked questions with answers on each of the three topics
- Helpful for the general practitioners, clinicians, students, patients and counsellors.

Available at all medical bookstores or buy online at www.jaypeebrothers.com

JAYPEE BROTHERS
Medical Publishers (P) Ltd.
www.jaypeebrothers.com

Join us on facebook.com/JaypeeMedicalPublishers

Shelving recommendation
OBSTETRICS & GYNECOLOGY

ISBN 978-93-5152-882-1