Gestational diabetes(GDM):

Professor

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Objectiv e:aim from this lecture

1.understand the morbidity of gestational diabetes

2.be able to manage cases with gestational diabetes

GDM complicates 10–15% of pregnancies depending on the diagnostic criteria used. (GDM) Definition: carbohydrate intolerance of variable severity first diagnosed during pregnancy and may or may not resolve after pregnancy. This definition includes women with previously undiagnosed diabetes at one end of the spectrum and those with disturbances of glucose intolerance resulting from the metabolic changes in late pregnancy that abut onto the upper limit of the normal range.The definition is applicable regardless of whether insulin is used for treatment or the condition persists after pregnancy.

The classic GDM diagnosed at 24 to 28 weeks' gestation is carbohydrate intolerance unmasked by diabetogenic hormones of pregnancy.

GDM diagnosed before 24 weeks is probably undiagnosed type 2 DM and is managed as pregestational DM.

Of the women who develop GDM, 20% to 50% will develop overt diabetes in the next 5 to 10 years, and 33% to 50% will have recurrent GDM in any future pregnancy. If GDM develops in subsequent pregnancies, the risk increases of developing overt diabetes.

Screening, for gestational diabetes

Methods:

Despite more than 40 years of research, there is still no agreement

regarding optimal gestational diabetes screening

FBS, RBS, glycoseurea) are not reliable during pregnancy)1.

2.HbA1c

3.OGTT. (The ‘gold standard’ diagnostic test for gestational diabetes )

sometimespreceded by a glucose challenge howeverthe consensus recommends a one-step 2-hour 75 g oral glucose tolerance test (OGTT) ,the ‘gold standard’ diagnostic test for gestational diabetes should be used to test for all women not already known to be diabetic at 24–28 weeks of gestation.

Diabetes is diagnosed where one or morethreshold value is exceeded

The UK National Institute for Health and Care Excellence

(NICE) guidelines (2015) recommend a diagnosis of GDM with a fasting glucose

≥5.6 mmol/l and/or a 2 hour (post-75 g glucose load) of 7.8 mmol/l.

The WHO guidelines (2013) recommend a diagnosis with a fasting glucose of 5.1 mmol/l and/or a 1 hour (post 75 g glucose load) of 10.0 mmol/l or 2 hour of 8.5 mmol/l.

Diagnosis of diabetes during the first half of pregnancy is suspicious for undiagnosed pre-gestational DM; GDM is usually a disorder of late gestation. In general, GDM is asymptomatic, although glycosuria and random hyperglycemia may be present

Preparation for oral GTT:.

Test done after overnight fasting. with the patient sitting quietly and not smoking; it is also important that the patient should have normal meals for the previous three days and should not have been dieting.

FBS is checked. Ask to take 75 g glucose dissolved in 300 ml water.

Blood glucose is checked after 1, 2hours.

Indications for oral GTT:

1. Glycoseuria in the first trimester.
2. Glycosuria on 2 or more occasions (second specimen taken after fasting) in the second or third trimester..
3. Polyhydramnios in the current pregnancy.
4. Macrosomia in the current pregnancy.
5. Previous unexplained still birth.
6. Obesity (BMI > 30).
7. Previous baby > 4.5 Kg.
8. Previous congenital abnormality.
9. Age > 35years.
10. Previous GDM.
11. > 3 spontaneous abortions in the 1st or 2nd trimester.
12. Family history of diabetes (1st degree relation).
13. Family origin with a high prevalence of diabetes:
    * 1. South Asian (specifically women whose country of family origin is India, Pakistan or Bangladesh)
      2. black Caribbean
      3. Middle Eastern (specifically women whose country of family origin is Saudi Arabia, United Arab Emirates, Iraq, Jordan, Syria, Oman, Qatar, Kuwait, Lebanon or Egypt).

Risks of GDM to women and babies include:

1.The infants of GDM women are at an increased risk for stillbirth .

2.Fetal macrosomia

3.Birth trauma (to mother and baby)

4.Induction of labour or caesarean section

5.Transient neonatal respiratory complications.

6.Neonatal metabolic( e.g hypoglycaemia and hypocalcemia),

7.Neonatal hematological (e.g. Bilirubinemia and polycythemia)

8. Increased perinatal mortality.

9. Pre-eclampsia,

10. In addition, there are long-term effects associated with GDM pregnancies such as an increased maternal risk of developing metabolic syndrome and Type 2 diabetes later in life, and an increased risk of obesity and glucose intolerance in the offspring developing later in the baby’s life.

11. There is adverse neurological and cognitive outcomes in addition to the possibility of early development of metabolic syndrome (hypertension, obesity and diabetes) when gestational diabetes is not treated or poorly managed

Congenital anomalies and spontaneous abortions are not as serious complications in GDM as they are in pre-gestational diabetes. However, due to the relatively high rate of undiagnosed Type 2 (10%) diabetic women in the GDM population, there should be a concerted effort to rule out the presence of congenital malformations .

Management of GDM.

The principles of management during pregnancy are the same as for women withpre-existing diabetes.

Glucose monitoring is carried out using a glucometer. The patient should record fasting glucose values and 1-hour (or 2-hour) postprandial glucose values with each meal to determine the adequacy of diabetic control. 1 h should be preferred as it corresponds to the blood glucose postprandial peak in healthy pregnant women. If the goal values are consistently exceeded, then further therapy is needed

Women areencouraged to maintain capillary blood (fingerprick) glucose

* Preprandial levels <5.3 mmol/l before meals

• 1 h Postprandial glucose≤ 7.8 mmol/L (140 mg/dL)

or

• 2 h Postprandial glucose ≤ 6.7 mmol/L (120 mg/dL)

Follow-up at the diabetes clinic should be performed monthly until the 28th week of gestation, fortnightly until the 36th week and weekly until term. Additional clinic visits

should be programmed if needed. Maternal surveillance should include monitoring of blood pressure and of urinary protein excretion to detect hypertensive disorders. Follow-up at the diabetes clinic should be performed monthly until the 28th week of gestation, fortnightly until the 36th week and weekly until term.

Glucose control.

The first line of treatment of GDM is with diet and modest exercise alone; however if the glycaemic targets are not met,

GDM is divided into two categories:

A1 (euglycemia achieved by diet alone)

A2 (glycemic status inadequately controlled by diet alone). If glucose levels cannot be controlled with diet alone, then further therapy is needed.

gestational diabetes will respond to changes in diet and exercise in most women

-Exercise. Moderate exercise has been shown to lower maternal glucose concentrations in women with GDM. Patients should be encouraged to maintain a healthy, consistent level of activity throughout pregnancy, provided that no complicating factors (i.e., preterm labor, pre-eclampsia, etc.) exist. Exercise alone may achieve euglycemia and therefore avoid the need for medical therapy

Criteria for insulin treatment of GDM.

Historically, insulin has been considered standard therapy

in women with gestational diabetes when target glucose levels

cannot be consistently achieved through nutrition and

exercise.insulin—is typically added:

1. if fasting levels persistently exceed 95 mg/dL
2. in women with 1-hour postprandial levels that persistently exceed 140 mg/dL
3. or those with 2-hour levels above 120 mg/dL.

Insulin Management

Depending on the maternal weight and recorded glucose levels, the insulin dosage should be initiated as follows: 0.7 units/kg for gestational age of 6 to 18 weeks; 0.8 units/kg for gestational age of 18 to 26 weeks; 0.9 to 1.1 units/kg for gestational age of 26 to 40 weeks.

A combination of intermediate-acting and short-acting insulin may be used, and

dose adjustments are based on glucose levels at particular times of the day.

Total daily dose should be divided in half, given every morning and evening.

Morning dose (before breakfast): two-thirds of dose given as intermediate (NPH) insulin (peak activity of 5 to 12 hours), one-third of dose given as a rapid acting insulin (soluble) The peak activity of this rapid acting insulin is 2 to 4 hours, the onset of action is 5 to 15 minutes. Evening dose (before dinner): one-half of dose given as NPH, one-half of dose given as soluble insulin. Evening NPH insulin may need to be moved to bedtime to achieve optimal fasting blood sugars. Occasionally, patients may require only one dose of NPH insulin at bedtime to obtain euglycemia.

Oral hypoglycemic agent

women who fail to achieve adequate glycaemic control with diet and exercise alone: oral hypoglycaemic agents or insulin will be required to control their gestational diabetes .Until further evidence is available oral hypoglycemic agents should be avoided in pregnancy. Nevertheless in the third world countries when insulin may not be readily available. Glyburide is an acceptable alternative to insulin when dietary management of GDM fails. Glyburide works by increasing tissue sensitivity to insulin. The starting dose is usually 2.5 mg at bedtime or 2.5 mg twice daily.Both glibenclamide(known in the US as glyburide) and metformin are effective treatments for gestational diabetes Metformin and glibenclamide cross the placenta and, while no immediate safety concerns for the fetus have been demonstrated, potential long-term effects remain under investigation.

Fetal monitoring.

GDM-A1 diabetic patients are not at increased risk for fetal demise before 40 weeks' gestation. Therefore, no antepartum testing is required beyond that recommended for a normal pregnancy. Women with GDM-A2 require antenatal testing similar to that recommended for pre-gestational DM (twice weekly NSTs/BPP from 32 to 34 weeks until delivery). A 34- to 36-week fetal growth ultrasonographic examination is recommended to assess fetal size.

Delivery.

GDM is not an indication for delivery by Cesarean section nor for delivery before 38 completed weeks of gestation. The prolongation of the gestation beyond 38 weeks increases the risk of fetal macrosomia without reducing Cesarean section rates, so that delivery during the 38th week has been recommended unless obstetric considerations dictate otherwise. Other authors suggest prolonging pregnancy till the due time in women treated with diet alone and presenting good metabolic control.

Induction of labor: GDM on diet control do not require any specific measure during labor other than ensure that hypoglycemia not occur. prolonged induction –delivery should be avoided. Women with GDM on insulin should be managed in same way to pre gestational diabetes.

Cesarean section:Women undergoing elective C/S should have an infusion of insulin & dexsrose.

Postpartum care:

Women who have been diagnosed with gestational diabetes should discontinue hypoglycaemic treatment immediately after birth.

Information and follow-up after birth

Women who were diagnosed with gestational diabetes should be offered lifestyle advice (including weight control, diet and exercise) and offered a fasting plasma glucose measurement (but not an OGTT) at the 6-week postnatal check and annually thereafter.