Diabetes in pregnancy

Lec: NO. 8
Classification

- pre-existing insulin-dependent diabetes mellitus (IDDM) or
- non-insulin-dependent diabetes mellitus (NIDDM) before pregnancy
- transient impaired glucose tolerance or diabetes during the course of her pregnancy (GDM).
Pre-pregnancy counseling

The aim of pre pregnancy counseling is to:
• Achieve the best possible glycaemic control before pregnancy
• To educate diabetic women about the implications of pregnancy.

Advice to:
take high dose (5 mg) folic acid pre-conception and for the first 12 weeks.

Hyperglycemia exerts its teratogenic effects during the period of organogenesis – the first 42 days of pregnancy – often before the pregnancy is medically confirmed.

The level of HbA1c in early pregnancy correlates well with the risk of early fetal loss and congenital abnormality.

Once HbA1c is 10 per cent, the risk of fetal loss during pregnancy is around 30 per cent, while the risk of congenital malformation is similar. Pre-pregnancy care could significantly reduce the rates of congenital malformation.
Targets for therapy pre-pregnancy should be to maintain HbA1c at 6.5 per cent and pre-meal glucose levels of 4–7 mmol/L. Finally, for women with established diabetic nephropathy, the chance of successful pregnancy diminishes sharply as serum creatinine increases (80 per cent chance if 125–180 μmol/L, 75 per cent chance if 180–220 μmol/L and 60 per cent chance if 220 μmol/L). The higher the pre-pregnancy creatinine concentrations, the higher the risk of permanent loss of renal function.
**Maternal and fetal complications of diabetes:**

**FETAL:**
- Congenital abnormality
- Perinatal mortality
- Fetal macrosomia
- Shoulder dystocia and therefore possible hypoxic damage
- Sudden, unexplained, late stillbirths historically occurred in 10–30 percent of diabetic pregnancies

**MATERNAL:**
Maternal morbidity in diabetic pregnancies is related to the severity of diabetic-related disease preceding the pregnancy
- Have pre-existing coronary artery disease.
- Pre-eclampsia is increased two- to four-fold in women with diabetes.
- Coexisting microalbuminuria or frank nephropathy
- Diabetic retinopathy are at risk of progression of the disease
- Increased incidence of infection, severe hyperglycaemia or hypoglycaemia, diabetic ketoacidosis and the complications that may arise from the increased operative delivery rate.
Management in pregnancy

• Pregnant women with diabetes should be managed in a joint clinic with an obstetrician and physician. Input from a dietician is also important and often a nurse or midwife specialist will act as an adviser to adjust the dose of insulin.
• A plan for the pregnancy should be set out and should include targets for glycaemic control, renal and retinal screening, fetal surveillance and plan for delivery.

Insulin doses will change in pregnancy due to the physiological increase in insulin resistance.
• Targets for therapy are to maintain HbA1c 6 per cent, with pre-meal glucose levels at 3.5–5.5 mmol/L and 2-hour postprandial levels of 6.5 mmol/L. This relative normoglycaemia means that asymptomatic hypoglycaemia can occur more frequently. Therefore, careful self-monitoring of glucose levels by women with diabetes is a critical aspect of care.
• nuchal translucency scanning,
• detailed ultrasound assessment for fetal anomalies
• fetal echocardiography.
• Serial growth scans are recommended to detect fetal macrosomia and polyhydramnios.
• Any concern for fetal well-being should lead to increased surveillance with Doppler ultrasound and CTG.
• If antenatal corticosteroids are indicated, an increase of 40 per cent at the time of the first dose and until 24 hours after the second dose will usually prevent loss of control
• Timing and mode of delivery should be determined on an individual basis. In general, provided the pregnancy has gone well, management aims to achieve a vaginal delivery between 38 and 39 weeks.
• Caesarean section rate among diabetic women often is as high as 50 per cent.
• A sliding scale of insulin and glucose should be commenced in labour, and maternal blood glucose levels maintained at 4–8 mmol/L to reduce risks of neonatal hypoglycaemia.
• The insulin dose can be halved after delivery.
Gestational diabetes

- occurs in 2–9 per cent of all pregnancies.
- Screening for diabetes in pregnancy can be justified to diagnose previously unrecognized cases of pre-existing diabetes and to identify a group of women who are at risk of developing NIDDM later in life.
- Oral glucose tolerance test commonly used.
- The aim of glucose control is to keep fasting levels between 3.5 and 5.5 mmol/L and postprandial levels 7.1 mmol/L
GDM risk assessment: Should be ascertained at the first prenatal visit

**Low Risk:** Blood glucose testing not routinely required if all the following are present: — Member of an ethnic group with a low prevalence of GDM — No known diabetes in first-degree relatives — Age < 25 years — Weight normal before pregnancy — Weight normal at birth — No history of abnormal glucose metabolism — No history of poor obstetrical outcome

**Average Risk:** Perform blood glucose testing at 24 to 28 weeks using either: — Two-step procedure: 50-g oral glucose challenge test (GCT), followed by a diagnostic 100-g oral glucose tolerance test for those meeting the threshold value in the GCT. — One-step procedure: Diagnostic 100-g oral glucose tolerance test performed on all subjects.

**High Risk:** Perform blood glucose testing as soon as feasible, using the procedures described above if one or more of these are present: — Severe obesity — Strong family history of type 2 diabetes — Previous history of GDM, impaired glucose metabolism, or glucosuria. If GDM is not diagnosed, blood glucose testing should be repeated at 24 to 28 weeks or at any time there are symptoms or signs suggestive of hyperglycemia.
Effects of pregnancy on diabetes

- Change in eating pattern
- Increase in insulin dose requirements
- Greater importance of tight glucose control
- Increased risk of severe hypoglycaemia
- Risk of deterioration of pre-existing retinopathy
- Risk of deterioration of established nephropathy
Non-proliferative diabetic retinopathy

- Aneurysm
- Hard exudate
- Hemorrhage

Proliferative diabetic retinopathy

- Growth of abnormal blood vessels
Factors associated with poor pregnancy outcome in diabetes

• Maternal social deprivation

• No folic acid intake pre-pregnancy

• Suboptimal approach of the woman to managing her diabetes

• Suboptimal pre-conception care

• Suboptimal glycaemic control at any stage

• Suboptimal maternity care during pregnancy

• Suboptimal fetal surveillance of big babies
Effects of diabetes on pregnancy

- Increased risk of miscarriage
- Risk of congenital malformation
- Risk of macrosomia
- Increased risk of pre-eclampsia
- Increased risk of stillbirth
- Increased risk of infection
- Increased operative delivery rate
Gestational Diabetes Overview