

## 10.0 Special areas of care

### 10.1 Recommendations

**Pregnancy and diabetes:** see 10.2.3-10.2.4

**Diabetes in young people:** see 10.3

**Diabetes in older adults:** see 10.4

### 10.2 Diabetes in pregnancy

Management of diabetes during pregnancy is the responsibility of diabetes specialists and obstetricians with special interest in diabetes. Multidisciplinary team care and high-risk pregnancy clinics are essential in managing pregnant women with pre-existing and gestational diabetes throughout pregnancy and postpartum. If feasible, joint medical-obstetric clinics should be established.

#### 10.2.1 Types of diabetes in pregnancy

Two types of diabetes are found namely pre-existing diabetes and gestational diabetes.

##### **Pre-existing diabetes and pregnancy**

Preconception care is essential. Women with type 1 and type 2 diabetes should be educated about effective contraception, the importance of planning pregnancy and regular follow-up visits.

##### **Gestational diabetes mellitus (GDM)**

Defined as carbohydrate intolerance of varying degrees of severity with onset or first recognition during pregnancy

If criteria for diagnosis of diabetes (Table 10.1), the diabetes is however managed as overt diabetes, likely to have been present before conception.

**Table 10.1 Classification of diabetes and gestational diabetes on screening during pregnancy**

<i>Classification</i>	<i>Criterion</i>
Diabetes	
Fasting glucose (mg/dl)	≥126
Random glucose (mg/dl)	≥200
HbA <sub>1c</sub> (%)	≥6.5
GDM (if not overt diabetes)	
Fasting glucose (mg/dl)	≥92
1-hour glucose (mg/dl)	≥180
2-hour glucose (mg/dl)	≥153

## 10.2.2 Screening and diagnosis of gestational diabetes (GDM)

Measure plasma glucose and/or HbA<sub>1c</sub> at the first prenatal visit in all women

- In those with a normal result at the first visit repeat at 24-28 weeks,
- In those with a normal result at the first visit who are high risk for GDM perform a 75-g OGTT at 24-28 weeks.

High risk for GDM is defined as:

- Age greater than 35 years
  - Marked obesity
  - personal history of GDM, prediabetes
  - Diabetes in first degree relative
  - History of poor obstetric outcome
  - Neonatal weight > 4.0 kg or >90th percentile for gestational age
  - History of adverse pregnancy outcomes
  - polycystic ovarian syndrome.
- Women with intermediate result at initial visit (Table 10.1) should have 75-g OGTT, and if normal repeat at 24-28 weeks
  - Women who meet the criteria for diabetes (Table 10.1) should have this managed as below
  - Repeat screening at any time in 3rd trimester if any clinical indicator of glucose intolerance arises (macrosomia, polyhydramnios, intra-uterine growth retardation, or persisting glycosuria) with an OGTT.

## 10.2.3 Management of diabetes mellitus in pregnancy

### 10.2.3.1 Pre-conception care of pre-existing diabetes mellitus

Women with type 1 and type 2 diabetes should be educated about effective contraception, the importance of planning pregnancy and regular follow-up visits. Optimal glycaemic control before conception and throughout pregnancy will reduce the risk of adverse pregnancy outcomes such as miscarriage, congenital malformations, birth trauma, and stillbirth.

Advise women to use reliable contraception and not to become pregnant if until pre-conception glycaemic goal is achieved.

Pre-conceptions goals are:

- HbA<sub>1c</sub> ≤ 7.0 %  
or
- Fasting and pre-meal glucose 80 – 110 mg/dl
- 2 hour post-meal glucose <140 mg/dl

### 10.2.3.2 Assessment of women before or when pregnant

Medical assessment should include:

- Review of medical and obstetric history and current medical management plan
- Type and duration of diabetes
- Assessment for diabetes-related complications
- Retinal, renal and cardiovascular assessment
- Body mass index
- Gynaecological assessment

### *10.2.3.3 Management advice for pregnant women*

Management should include:

- advice from a joint obstetric medical team
- continuation of metformin throughout pregnancy
- continuation of insulin if used, adjusting doses and regimen to achieve glycaemic goals
- use of anti-hypertensive drugs as indicated: discontinue ACE inhibitors and angiotensin II receptor blockers (preferably before conception), and replace with hydralazine, methyldopa, a calcium channel blocker or labetalol
- discontinuing statins (preferably before conception)
- prescription of multivitamins containing 5 mg/day folic acid
- referral to registered dietician for assistance and provision of an individualized meal plan based on pre-pregnancy weight, activity, hunger, ketosis, hypoglycaemic, and blood glucose profile
- recommendation for individualized activity programme and with re-evaluation according to gestational age and obstetrical status
- referral to an education program for SMBG if not already used
- starting insulin therapy if inadequately controlled on dietary measures and metformin within two weeks
- consideration of use of metformin in women with GDM with inadequate control on medical nutrition therapy
- consideration of addition of glibenclamide to metformin as an alternative in women with GDM who are reluctant to take insulin.

### *10.2.3.4 Nutritional management of gestational diabetes*

Weight loss is not recommended during pregnancy but for overweight and obese women with GDM moderate caloric restriction by 30% of estimated energy need may improve glycaemic control without ketonaemia and reduce maternal weight gain. Due to continuous fetal draw of glucose from the mother, maintaining consistency of time and amounts of food eaten are important to avoid hypoglycaemia.

There are four principles of diet for gestational diabetes:

- A minimum of 175 g carbohydrate per day should be provided
- Encourage complex high fibre carbohydrate (28 g/day)
- Encourage consumption of unsaturated fatty acids including n-6 and n-3 fatty acids; limit saturated fat and trans fat to minimum (<10% of energy intake)
- Consumption of adequate amount of protein (1.1 g/kg/day).

#### 10.2.3.5 *Goals of glucose control during pregnancy*

- Fasting and pre-meal glucose 70-90 mg/dl
- Post-meal glucose <140 mg /dl
- HbA<sub>1c</sub> <6.5 %
- Urine ketones negative

Blood glucose targets must be relaxed for patient with hypoglycaemia unawareness or recurrent hypoglycaemia.

#### 10.2.3.6 *Intra-partum glucose monitoring*

Avoid maternal hypoglycaemia, which increase the risk of fetal acidaemia and neonatal hypoglycaemia and monitor bedside capillary blood glucose:

- on admission to labour ward
- every 2 h in early labour
- every 1 h in active labour
- every 1 h during insulin injection
- check urine for ketones.

Women with gestational diabetes well controlled with diet and exercise therapy alone rarely require insulin during labour so capillary blood glucose levels can be checked on admission and every 4-6 hours.

Where insulin is required to maintain blood glucose control during labour, it should be given as an intravenous infusion according to blood glucose levels beginning at 1-2 U/h, avoiding hypoglycaemia.

#### 10.2.3.7 *Goals of glucose control during pregnancy*

- Encourage breast feeding
- Discuss family planning before discharging the patient from hospital
- Avoid unplanned pregnancy and attend pre-conception care when planning for future pregnancy
- Refer women with pre-existing diabetes back to their routine diabetes care
- Assess women diagnosed with GDM, and refer back to community care if their blood glucose level showed persisting hyperglycaemia
- Inform woman diagnosed with GDM to seek medical advice if they develop symptoms of suggestive of hyperglycaemia

- Follow individualized lifestyle advice regarding diet and exercise
- Inform women with GDM about their risk of developing type 2 diabetes.

## **10.3 Diabetes in young people**

### **10.3.1 An overview**

Approximately three-quarter of all newly diagnosed cases of type 1 diabetes occur in individuals younger than 18 years. Care of this group requires integration of diabetes management with the complicated physical and emotional growth needs of children, adolescents, and their families.

Information should be supplied to the school or day care setting so that school personnel are aware of the diagnosis of diabetes in the student and of the signs and symptoms and treatment of hypoglycaemia.

Management of diabetes during childhood remains the responsibility of the paediatric departments in hospitals. In smaller hospitals, a paediatrician with interest in diabetes should be designated to look after the cohort in the district. In larger teaching hospitals, care should be organized in specialist clinics, to education, training and research. These will be acting as tertiary referral centres for the smaller hospitals. Doctors in primary care sectors should be competent in recognizing diabetic emergencies in children and be familiar with the appropriate clinics in their locality.

A detailed descriptive account of practical management of diabetes in young people is beyond the scope of these guidelines. However, local protocols for care with adequate details should be made available in every paediatric department. These should be prepared and maintained up to date by the local paediatric endocrinologists and made available in hard and soft copies.

### **10.3.2 Specific challenges to diabetic care in younger people at different stages**

#### *10.3.2.1 Challenges for infants and toddlers, and their caregivers*

- Dependence on parents and care providers for managing diabetes
- Irregular eating and activity levels
- Difficulties for caregivers to distinguish normal behaviour from diabetes-related mood swings
- Pain caused by injections and glucose monitoring
- Hypoglycaemia (low blood sugar) is more common.

#### *10.3.2.2 Challenges for school-age children*

- Adjusting to change from home to school environment
- Establishing relationships with other children
- Learning to self-manage their diabetes
- Adapting their diabetes to the school environment.