MANAGEMENT OF DIABETES MELLITUS IN PREGNANCY

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January 2009

MANAGEMENT GUIDELINES OF DIABETES MELLITUS IN PREGNANCY

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A. DIAGNOSIS AND SCREENING

1. CATEGORIES OF PREGNANT DIABETICS

Pre-gestational Diabetes

Women with diabetes and glucose intolerance before the onset of pregnancy

Gestational Diabetes (GDM)

Women with any degree of glucose intolerance with onset or first recognition during pregnancy

2. SCREENING FOR GESTATIONAL DIABETES

Risk Assessment
to be undertaken at the first antenatal visit.

Maternal risk factors

- Previous abnormal glucose tolerance / GDM
- 1st degree relatives with DM
- Maternal obesity: ≥80 kg or BMI ≥30 at any time in pregnancy
- Maternal age > 35 years
- History of Polycystic Ovarian Syndrome (PCOS)

Obstetric risk factors

- Previous big baby (3.8 kg or more)
- Bad obstetric history (recurrent abortions, congenital malformations, unexplained intra-uterine death)
- Polyhydramnios (from 24th weeks onwards)
- Fetal abdominal circumference ≥ 90th centile (from 24th weeks onwards)

- Women with any one risk factor to proceed to the **diagnostic test**
  - perform as soon as possible after confirmation of pregnancy
  - repeat at 24-28 weeks if normal in the first instance
- All other women without any of the risk factors
  - Urine glucose at each antenatal visit
  - If urine glucose 2+, check Capillary blood glucose and proceed to OGTT if >7 mmol/L, or proceed straight to OGTT
  - if 2 episodes of glycosuria (trace or 1+)→ proceed to OGTT

3. DIAGNOSIS OF GDM

a) Random or fasting plasma glucose.

- Random plasma glucose ≥11.1mmol/L **or**
- Fasting plasma glucose ≥7.0 mmol/L

Diagnostic of GDM if present on 2 separate occasions, no OGTT needed.

b) 75g Oral Glucose Tolerance Test (OGTT)

- Non-CHO restricted diet >3 days before test.
- Fasted for 10hrs overnight.
- Venous blood samples at 0 and 2h after oral glucose load.

2h PGL ≥7.8mmol/L = diagnostic of GDM

B. MANAGEMENT

1. PRECONCEPTION CARE

Target audience: all diabetic women with childbearing potential

Pre-pregnancy Counseling

- Risk of malformation, spontaneous miscarriage, stillbirth and neonatal death associated with unplanned pregnancies and poor metabolic control
- Establishing good glycaemic control before conception and continuing this throughout pregnancy will reduce (but not eliminate) above risks
- Use of effective contraception until good metabolic control is achieved (at least HbA1c < 7%)
- Women with diabetes whose HbA1c > 10% should be strongly advised to delay pregnancy till good control is achieved
- Women with diabetes who are planning pregnancy should be advised to take folic acid (5mg/day) until 12 weeks of gestation to reduce the risk of having a baby with a neural tube defect
- Stop smoking

Diabetes Treatment

- Evaluate pre-existing medical conditions and diabetic complications.

- Convert patients on oral antidiabetic drugs to insulin therapy. **(Note:** Patients with Type 2 DM on metformin should be allowed to <u>continue</u> their medication till she is converted to insulin.**)**

- Metformin use during pregnancy, on a case to case basis, **MUST** be discussed with specialist first before starting.

- Use regular human insulins.

- Education on diabetic home management skills
  - Appropriate meal plan and physical activity
  - Self-monitoring of blood glucose (pre- and post meal readings)
  - Management of hypoglycemia
  - Plasma ketone monitoring (for selected Type 1 DM patients)

- Glycaemic Target
  - HbA1c ≤ 6%
  - Premeal capillary BG 4.0 - 5.3 mmol/l
  - 2h postprandial capillary BG < 6.7mmol/l
  - (1h postprandial BG < 7.8 mmol/l)

2. ANTENATAL MANAGEMENT

a) Referral

MCH/clinic level to refer all cases of GDM to a MO within 2 weeks

- Follow up and management of such patients can be done at the district hospital/MCH level where specialist care may not be easily accessible to patients
- Refer to specialist if possible complications are detected or if difficult to attain good glycaemic control or if unable to manage.

Where specialist care is accessible, refer to:

i) Antenatal Combined Clinic / Antenatal Diabetic Clinic

- All pre-gestational diabetics at booking
- GDM when initiated with insulin

ii) Diabetes nurse educator and dietitian

- All pre-gestational diabetics and GDM patients to be referred on booking for counseling and education e.g. hypoglycaemia, injection instructions, instruction book, and home glucose monitoring (use and calibration of reflectance meter)

iii) Opthalmologist (where available)

- All pregestational diabetics for screening and monitoring of retinopathy at first antenatal visit and again at 28 weeks if first assessment if normal
- If any diabetic retinopathy is detected, additional retinal assessment should be done at 16-20 weeks
- Women who have pre-proliferative retinopathy diagnosed during pregnancy should have an eye follow up for at least 6 months following the birth of the baby

b) Monitoring

- **Pregestational DM**

Home glucose monitoring (strongly encouraged)

- Type 1 DM
- Poorly controlled Type 2 DM
- (All pregestational Diabetes to be encouraged if able to afford.)

Minimal weekly monitoring at Daycare

- Premeal tds and prebed, alternate with
- 2-hour postprandial tds the next week

(2-weekly monitoring at antenatal daycare, only for low risk patients with good glycemic control.)

- **Gestational Diabetes**

  - Home glucose monitoring encouraged if able to afford
  - 2-weekly monitoring at daycare
  - Premeal tds alternate with 2-hour postprandial the next visit.

- **High risk GDM**

  - High glucose level
  - FBS>7.0 mmol/L
  - 2-hour post OGTT > 11.1 mmol/L
  - HbA1c > 6.5%
  - GDM diagnosed before midgestation

  Likely to represent undiagnosed type 2 DM
  To be managed and monitored as for pregestational DM

- **Monitoring in Clinic Visit**

  - Urine dipstix for urine glucose, ketones and protein at each visit
  - BP measurement at each visit
  - Random or 2h post-prandial finger prick capillary glucose
  - HbA1c (first trimester only and if clinically indicated)

c) <u>Insulin Therapy</u>

- GDM
  Indicated if BSP unsatisfactory after minimum of 3 days dietary treatment.

- Pregestational diabetes
  Type 2: convert oral agents to insulin treatment if not done pre-conception. May need intensive insulin treatment

  Type 1: will need intensified 3-4 daily insulin injections.

d) Glycemic Targets

- Pre-meal capillary BG 4.0 – 5.3 mmol/l
- 2h post-meal capillary BG < 6.7 mmol/l
- (1h post meal capillary BG< 7.8 mmol/l)
- HbA1c < 6 %

3. ANTENATAL CARE

- All GDM should be managed by doctors and should deliver in a hospital setting.
- Where specialist care is accessible, shared care with MCH/Polyclinic is ideal. When shared care is not practical, patients with GDM should at least see a specialist once.
- The aim is to achieve normoglycaemia from as early in gestation as possible.
- Early booking is encouraged. If possible, those on insulin therapy should be referred to antenatal diabetic clinic.
- At booking, check BP, urine (protein / ketones), HbA1c (first trimester only), BUSE and creatinine. Perform ultrasound at **first visit** to confirm viability and date of gestation age (use CRL if < 14w, 14-24w BPD, >24w HC). When dating is carried out in the second or third trimester, it is essential to book a follow-up growth scan to assess growth velocity, in 4 weeks.
- Refer to eye clinic for those with pre gestational diabetes mellitus.
- Referral should be made as early as possible to the dietician and diabetic nurse to re-emphasize on dietary control and to re-evaluate compliance with insulin use
- BP and urine (protein & glycosuria) check at every clinic visit.
- Very high risk patients with the following criteria: (1) high HbA1c on conception >8.5% (2) previous affected fetal anomalies (3) previous intrauterine deaths (4) other poorly controlled endocrine disorders, please arrange for detailed anomaly scan and fetal echocardiography at 20-22 weeks gestation by Dr. Nicholas Ngeh.
- Routine Serial ultrasound biometry BPD, HC, FL, AC, liquor volume and umbilical artery doppler should be arranged and scanned by MOs from 24 weeks gestation onwards for ALL patients. The growth scan should be repeated every 4 weeks to check the growth velocity. Please consult the obstetrician in clinic if any of the above is abnormal. Additional scan is indicated if macrosomia is detected.
- Correct Growth charts must be plotted after each scan.
- Insulin intensification may be considered if there is accelerated growth.

4. DELIVERY

a) Timing of delivery

- In well controlled diabetics, aim for vaginal delivery at 38-40 weeks gestation.
  - Elective induction at 38 weeks if requiring insulin for glucose control.
  - GDM on diet control, may allow up to 40 weeks, if blood glucose is well controlled and the serial growth scans are normal.
- In poorly controlled diabetics, the timing and mode of delivery will be decided individually by the specialist

b) Mode of delivery

- GDM by itself is not an indication for delivery by caesarean section or for delivery before 38 weeks
- It is reasonable to recommend caesarean section if suspect of fetal macrosomia (estimated birth weight from growth scan > 4.0 kg), for fear of shoulder dystocia complicating macrosomic vaginal deliveries.

5. INTRAPARTUM CARE

Women should continue their regular diet, insulin and blood glucose monitoring until in labour. During active labour, the blood glucose level should be measured every 1–2 hours, and should be kept within the range of 4–7 mmol/L.

Maintain an infusion of 500ml of 5% dextrose and 1 gram (13.4 mmol/l) KCl at 100ml/hour.

Administer a separate insulin infusion (50 units actrapid in 50 ml normal saline) by infusion pump. Initial rate = total daily requirement of insulin divided by 24 per hour.

Perform hourly blood glucose monitoring (glucometer) and adjust the insulin infusion rate as per sliding scale to keep the BM between 4 - 7 mmol/l.

BM (mmol/l)	Rate (ml/h = unit/h)
0-4	0 (inform MO)
4.1-8	1
8.1-12	2
12.1-16	3
16.1-20	4
20.1-25	5 (inform MO)
>25	Medical review

- Group and match
- BUSE and blood sugar every 4-6 hourly
- continuous CTG in labour
- Vigilance needed to avoid shoulder dystocia or difficult vaginal deliveries

Management of diabetes during caesarean section

As per Labour Ward protocol

C. POSTNATAL CARE

In general, all GDMs and pre-gestational DMs are encouraged to breastfeed.

Pre-gestational DM

Type 1 DM
- Resume insulin regime taken before pregnancy. The dose may have to be adjusted further. (Usual requirement ~0.5U/kg/day)

Type 2 DM
- If breastfeeding, monitor BSL premeal tds. May require od or bd insulin which can be given as Humulin 30/70 or Humulin N.
- Metformin may be used in breastfeeding if necessary after appropriate counseling and informed consent
- If not breastfeeding, may resume OHA.

Need medical follow-up as outpatient for continuing care.

GDM

- Check pre-meals blood glucose for patients with ***GDM on insulin***

- In general, most GDM do not require insulin postpartum

- If BSLs remain persistently high, i.e. pre-meal ≥ 8mmol/l, 2h >10 mmol/l. Managed as for type 2 DM above. Need medical follow-up on discharge.

- Give appointment for repeat FBG +/- 75g OGTT at 6 weeks postpartum

- All patients to be counseled on:

- Risk of GDM in future pregnancy
- Risk of established diabetes or glucose intolerance in future
- Importance of continuing lifestyle modification
- Need for long term follow-up and screening with annual fasting glucose.

Contraception

Any non-hormonal (if breastfeeding) or hormonal (if not breastfeeding) may be considered as appropriate

D. INFANT CARE

All babies are to be fed early.
BG checked 3 to 4 hours after birth to exclude hypoglycaemia.
BG repeated 6 hoursly for first 24 hours of birth, and more frequently if indicated.
Infant with recurrent hypoglycemia (BG < 2.6 mmol/L) despite feeding, should be admitted to nursery.

For pregestational DM, screen infant for congenital malformations associated with diabetes.

Other associated morbidities include polycythaemia, hyperbilirubinaemia, hypocalcaemia and respiratory difficulties.