Managing diabetes in pregnancy

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Overview

- Types of diabetes
- Importance of pre-conception counselling in women with pre-existing diabetes
- Risks of poorly controlled diabetes in pregnancy to the mother and fetus
- Managing diabetes in each trimester of pregnancy
- Other considerations
- KEMH Telehealth Service

TYPES Of DIA BETES

- **Type 1**
  - B-cell destruction
  - Usually autoimmune
- **LADA (Latent Autoimmune Diabetes of Adult)**
- **Type 2**
  - Insulin resistance and insulin secretory defect
  - **MODY**
  - Monogenic diabetes-caused by a single gene mutation affecting 1-2%-MODY
- **Gestational diabetes**
  - Usually appears during pregnancy, 2-3rd trimester
  - Within 5-10years, 30-40% will develop T2DM
- **Pre-diabetes (IFG and IGT)**

- Defects of Beta cell function due to genetic mutations
    - various types MODY (14 diff MODY mutations)
        - monogenic, single gene defects
        - dominant inheritance, affects several generations.
- Genetic defects in Insulin action.
- Diseases of the Exocrine Pancreas
    - CF
    - Pancreatitis.
- Endocrinopathies
    - Drug or chemical induced

Preconception care

- Ideally offered to all women with pre-existing diabetes of reproductive age
- Reduces the risks of major congenital anomalies and perinatal morbidity
- This care aims to:

➢Optimise glycaemic control

➢Assess and manage diabetes complications

➢Review of potentially teratogenic medications

➢Commencement of folic acid

Effects of pregnancy on diabetes

- Increased insulin resistance and altered carbohydrate metabolism
- Increased insulin requirements
- Accelerated vascular damage
- Ketoacidosis can be precipitated by:

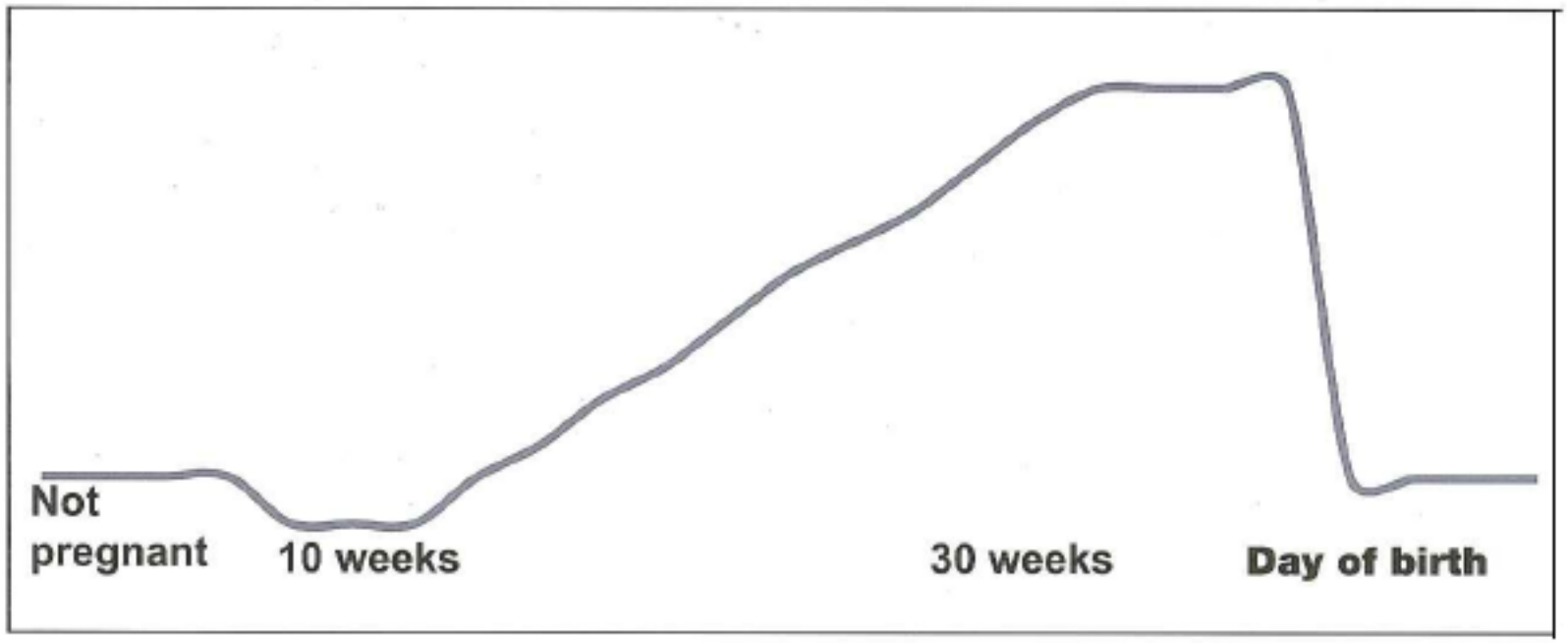
➢Hyperemesis

➢Infection

➢Corticosteroids

➢Tocolytics

Insulin requirements during pregnancy



Effects of diabetes on pregnancy

Maternal Risks:

- Miscarriage
- Hypertensive disorders
- Infection
- polyhydramnios

Women with pre-existing diabetes:

- Worsening retinopathy, nethropathy
- Increasing insulin requirements
- Hypoglycaemia
- ketoacidosis

Chronic complications of Diabetes
1) Hypertension

- 1 in 10 diabetic pregnancies
- Those with underlying renal or retinal vascular disease are at higher risk
  - 40% will have chronic hypertension
- Patients with chronic hypertension and diabetes are at increased risk of:
  - IUGR
  - Superimposed PET
  - Abruptio placentae
  - Maternal stroke

2) Renal dysfunction

- Patients with underlying nephropathy can expect deterioration of renal function during pregnancy
- Renal blood flow and glomerular filtration rate increase 30-50% during pregnancy
    - Results in the degree of proteinuria increasing
- Pregnancy does not alter the course of diabetic renal disease, nor does it increase the progression to end stage renal disease
    - This is related to the duration of diabetes and degree of glycaemic control
- Perinatal complications are higher in patients with diabetic nephropathy, eg:
    - Preterm birth
    - IUGR
    - PET

3) Diabetic Retinopathy

- Leading cause of blindness in women aged 24-64
- Risk factors for progression during pregnancy
    - Pre-existing retinopathy
    - Poor glucose control preconception
    - Longer diabetes duration
    - Rapid improvement in BGL control during first trimester
    - Previous or current PIH
- Ideally- detailed eye exam preconception.
    - permits appropriate mx before optimisation of BGL control
    - hence reduce risk of progression
- Retinal assessment, ideally (UK guidelines)
    - First AN appointment, if not performed in the previous 12 months
    - At 28 weeks if first assessment is normal
    - Additionally at 16-20 weeks if any retinopathy is present

Miscarriage

- Strong link between quality of glycaemic control prior to conception and miscarriage rate
  - Poor control = increased risk of miscarriage
  - Patients with long-standing (>10 y) and poorly controlled (HbA1c > 11%) diabetes have been shown to have a miscarriage rate of up to 44%
- Conversely, a normalisation of miscarriage rate with excellent glycaemic control

Effects of diabetes on Pregnancy

Fetal risks

- Congenital anomalies
- Fetal macrosomia
- Shoulder dystocia
- Late still birth
- Premature delivery

Neonatal risks

- Neonatal hypoglycaemia
- Polycythemia
- Jaundice
- RDS

Childhood risks

- Obesity
- Type 2 diabetes

Fetal Anomalies

- In the general population, major birth defects occur in 1-2% of births
  - Rises 4-8 fold in women with overt diabetes and suboptimal glycaemic control prior to conception
- All structural anomalies are more common
  - Two-thirds of anomalies involve the cardiovascular and central nervous systems
  - Neural tube defects occur 13-20 times more frequently in diabetic pregnancy
- No increase in birth defects occurs among the offspring of:
  - Fathers who are diabetic; or
  - Women who develop gestational diabetes after the first trimester
  - Meticulous glycemic control periconceptionally – only way to reduce the risk (HbA1C < 6.5% = risk of anomalies in a normal pregnancy population

1st trimester of pregnancy

- Check if on folic acid
- Review and change meds
- Tight glycaemic control
- Dating/viability scan
- Discuss first trimeter screening and options
- Opthalmology screen
- Assess renal function
- Always do 13 week scan even if has low risk NIPT

2nd trimester

- Consider 16/40 anatomy for HbA1c above 10%
- Optimise diabetes control
- 20/40 GTT for high risk women
- Switch from megafol to pregnancy multi's
- Repeat HbA1c
- Consider commencing aspirin and calcium if prev PET or high risk of PET

3rd trimester

- Serial growth and well being scans
- Repeat ophthalmology screening
- Review renal function
- Repeat hbA1c, continue optimizing control
- Watch for decreasing insulin requirements
- CTG's as indicated
- Antenatal expressing from 36/40 if no contraindications
- Planning timing and MOD
- Delivery by 41+3 for GDM diet with normally grown fetus

Gestational Diabetes

Risk factors:

- Ethnicity
- Advanced maternal age
- Obesity
- Family history of diabetes
- PCOS
- Previous poor obstetric history

Postpartum management

- Baby needs feeding within 1 hour of birth
- Monitoring of PGL's pre 2nd and 4th feed
- Type 1's insulin requirements
- Stop type 2's and GDM's insulin
- Metformin can be recommenced
- Review pre pregnancy medication with possibility of recommencing
- Offer contraception
- Follow up GTT for GDM's
- Discuss/offer preconception review 3 months prior to ceasing contraception

Antenatal corticosteroids and the Diabetic Patient

- Bsl's increase
- Will require insulin dose adjustment for up to 4 days
- Watch for DKA
- Test for blood ketones not urine

Bariatric surgery considerations

- Rates of bariatric surgery have risen 800% worldwide
- Women account for 80%
- 56% of child bearing age
- Ideally weight 12 to 18 months
- Offer contraception
- Most women will not be at their goal weight by conception
- Monitor for nutritional deficiencies in pregnancy

- Monitor fetal growth closely in women who have had bypass surgery
- GTT's not well tolerated
- High risk or early or late dumping following glucose load
- Other options to GTT:

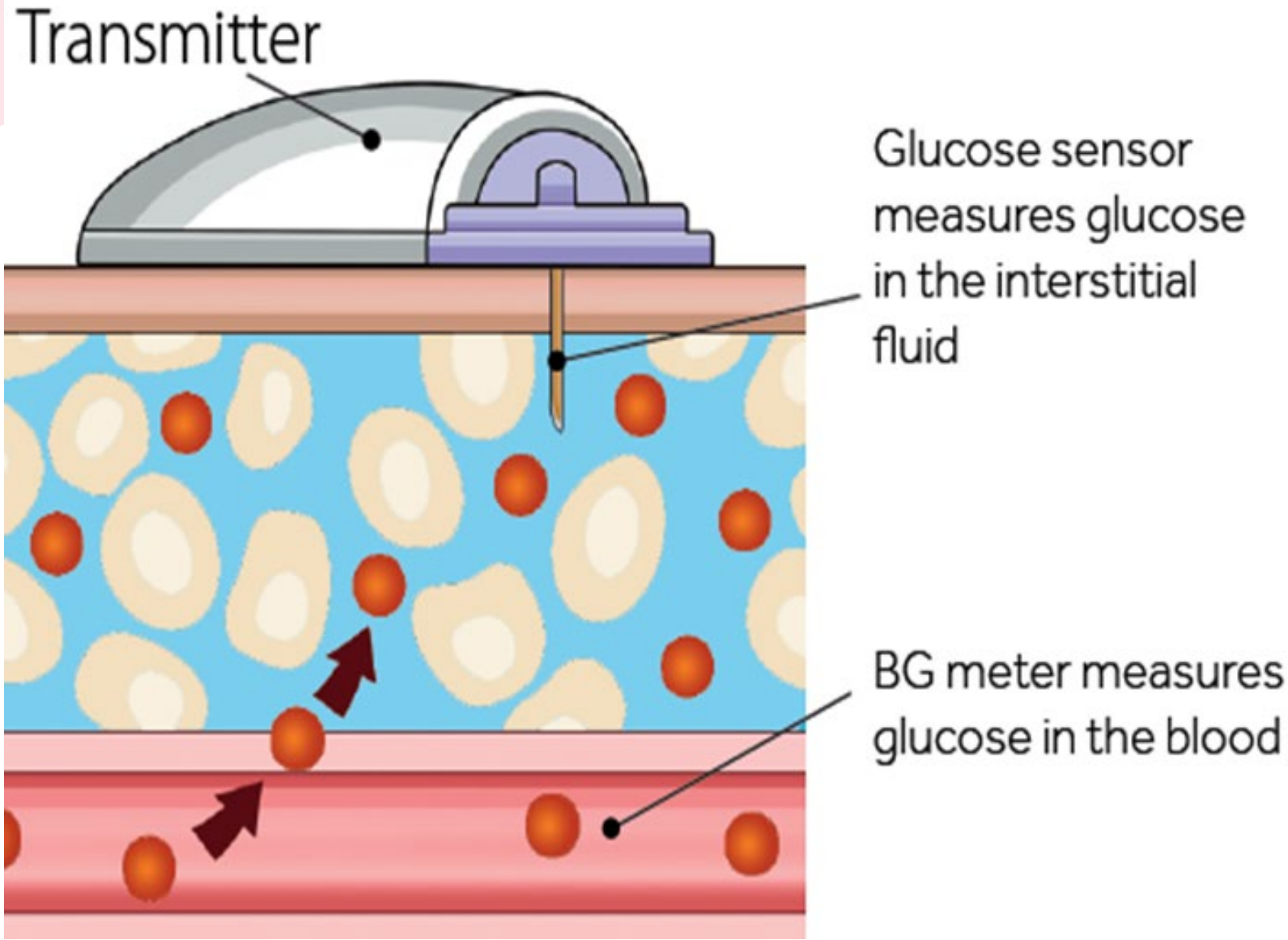
➢Fasting plasma glucose after 12/40

➢CGM for 7 days

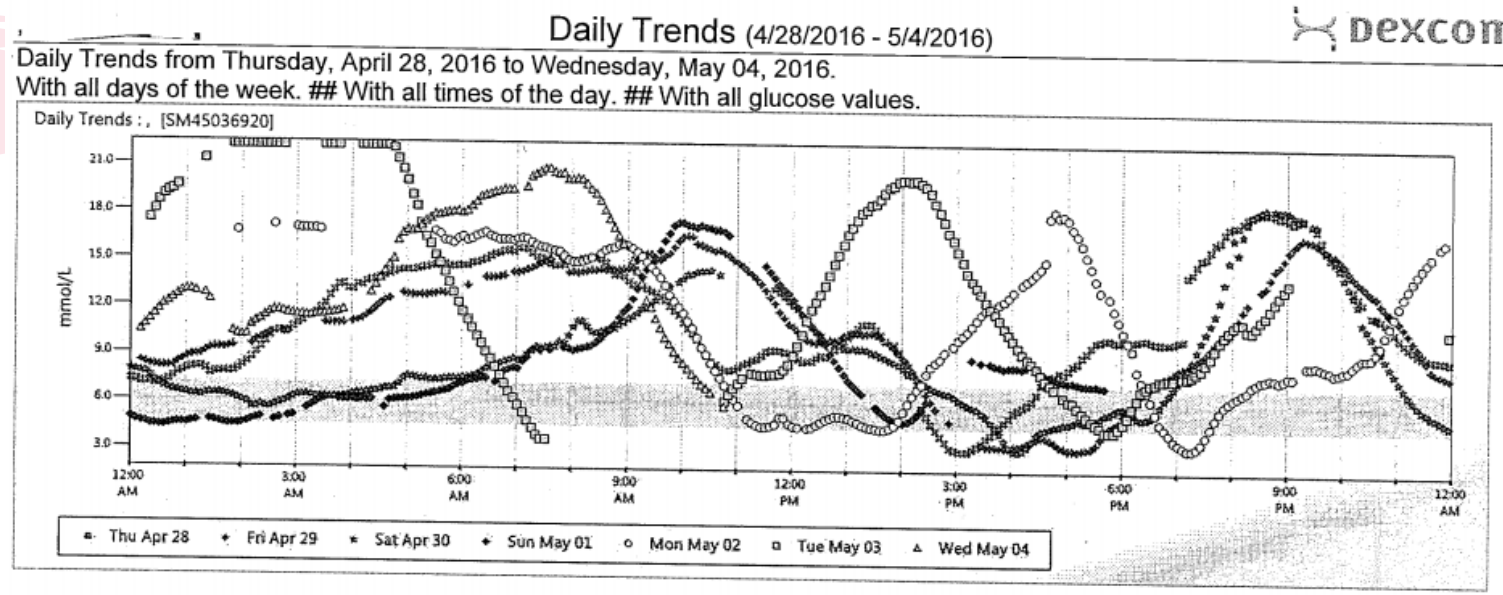
➢Bsl testing for 1 week from 24 – 28/40

CGM

- Translation of data into management decisions.
- Patterns, ranges, summaries of statistics, possible considerations
- Best interpreted with diary information, including insulin administered, meals exercise & hypo symptoms.
- Some allow real time use and other retrospective data analysis. Alarms and Alerts
- Active Monitoring when patients cannot
- Hypoglycaemia…unawareness , nocturnal, reduced occurrence.
- Tighter control and fine tuning…where your glucose is, where its going and how fast its getting there.
- What you put in…you get out.


Transmitter
Glucose sensor measures glucose in the interstitial fluid
BG meter measures glucose in the blood

Freestyl e Libre


Daily Trends (4/28/2016 - 5/4/2016)
dexcom
Daily Trends from Thursday, April 28, 2016 to Wednesday, May 04, 2016.
With all days of the week. ## With all times of the day. ## With all glucose values.
Daily Trends : , [SM45036920]
mmol/L
21.0
18.0
15.0
12.0
9.0
6.0
3.0
12:00 AM
3:00 AM
6:00 AM
9:00 AM
12:00 PM
3:00 PM
6:00 PM
9:00 PM
12:00 AM
Thu Apr 28
Fri Apr 29
Sat Apr 30
Sun May 01
Mon May 02
Tue May 03
Wed May 04

CGM

KEMH Diabetes Telehealth Service

- Established for 13 years now
- Available to country WA, Christmas and Cocos Islands
- GDM education done through Diabetes WA
- Women do not have to be delivering at KEMH
- Aim is for majority of care in country town with apps coinciding with scans at KEMH
- VC's with multi disc team during diabetes ANC