Gestational Diabetes Mellitus

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Acknowledgements

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Preamble

Guidelines outline recommendations, informed by both the best available evidence and by midwifery philosophy, to guide midwives in specific practice situations and to support their process of informed decision-making with clients. The midwifery philosophy recognizes the client as the primary decision maker in all aspects of her care and respects the autonomy of the client (15).

The best evidence is helpful in assisting thoughtful management decisions and may be balanced by experiential knowledge and clinical judgment. It is not intended to demand unquestioning adherence to its doctrine as even the best evidence may be vulnerable to critique and interpretation.

The purpose of practice guidelines is to enhance clinical assessment and decision-making in a way that supports practitioners in offering a high standard of care. This is supported within a model of well-informed, shared decision making with clients in order to achieve optimal clinical outcomes.

As is the case with many clinical practice issues in maternity care, available research on gestational diabetes mellitus (GDM) presents care providers with a great volume of conflicting information. Evidence-based practice must still be balanced with community standards. This guideline presents some of the available evidence surrounding GDM and a guideline for midwifery practice.

Definition

"Gestational Diabetes Mellitus (GDM) is defined as carbohydrate intolerance of variable severity with onset or first recognition during the present pregnancy" (1)(2).

Prevalence

Prevalence of GDM is reported to be between 1.1 to 14.3% among pregnant women in the US. Canadian data cited in the SOGC Clinical Practice Guideline (2002) on GDM ranges from 3.8 to 6.5% (1). Of note, these prevalence rates are likely be higher with the new screening recommendations listed below.

Complications Associated with GDM

- Macrosomia: Fetal macrosomia is defined as infants whose birth weight exceeds 4500 g (2). Up to 30% of women who have an abnormal glucose tolerance test will deliver an infant weighing 4000 g or more (3). Macrosomia is associated with increased labour dystocia, birth trauma, shoulder dystocia, and operative deliveries (1)(2)(3). However, about 95% of all infants weighing over 4000 g will not have shoulder dystocia (4). In addition, the majority of macrosomic infants will be delivered by women with normal glucose tolerance test results (3).
- Hypoglycemia and associated metabolic complications in the neonate (1)(2).
- GDM is associated with increased risk of developing obesity, sustained glucose intolerance and Type II Diabetes later in life for both mother and infant (1)(5).

Risk Factors

- Advanced maternal age (1)*
- BMI >/= 28
- Ethnic origin: Hispanic, African, Aboriginal, Asian, Middle Eastern
- Maternal family history of Type II or Gestational Diabetes Mellitus, or glucose intolerance
- Repeated glucosuria in pregnancy
- Multiple pregnancy
- Polyhydramnios
- Suspected macrosomia
- Previous infant weighing > 4000g
- Previous unexplained stillbirth
- Previous infant with congenital malformations
- Previous neonatal hypoglycemia, hyperbilirubinemia, or hypocalcaemia (1)(2)(6)

* There is discrepancy in the literature regarding which age increases a woman's risk, ranging from >30 to >35 years. The SOGC states that age of <25 years makes a woman "low risk" (1)

Clinical Signs and Symptoms

- Fundal height >3cm higher than gestational age
- Hypertension
- Excessive weight gain
- Persistent glucosuria
- Persistent yeast or urinary tract infections

Understanding Screening and Diagnosis

The original purpose of GDM screening and diagnosis, established in the 1960s, was to identify women at high risk of diabetes following pregnancy, rather than identification of pregnancies at increased risk for adverse outcomes [ref IADPSG]. At present there is lack of consensus in the literature as to risk of adverse perinatal outcomes associated with maternal glucose intolerance of lesser severity than those of overt diabetes in pregnancy [ref IADPSG & HAPO].

Various methods of screening and diagnosis of GDM are described in the literature. Random glucose tests, post-prandial glucose tests, 50 g glucose challenge test (GCT) and 75 g and 100 g oral glucose tolerance test (OGTT), as well as screening by risk factors versus universal screening are presently debated. The 2008 Hyperglycemia and Adverse Pregnancy Outcomes (HAPO) study, an observational study, examined the risks of adverse outcomes associated with varying degrees of maternal glucose intolerance less severe than that in overt diabetes [ref HAPO]. The 75g OGTT was administered to 25,505 women, and data were collected on adverse perinatal outcomes among these women. They cite a plausible relationship between maternal glycemia and adverse outcomes, without the data to demonstrate a causal relationship [ref HAPO]. The findings show associations between maternal glucose levels below overt diabetic levels with increased birth weight and

increased cord-blood serum C-peptide levels (evidence of fetal hyperinsulinemia) [ref HAPO]. The IADPSG sought international consensus for GDM diagnosis in order to translate the HAPO results into clinical practice; their recommendations are listed below.

Detection rates for GDM will vary depending on the testing method used. For example, in the HAPO study, universal use of the 75g OGTT yielded a 17.8% incidence of GDM [ref HAPO & IADPSG]. This increases diagnosis of GDM up from the previously reported incidence level of 1.1%-14.3%, although the SOGC guideline states that Canadian figures may be more around 6.5% incidence rate with the 50g followed by 100g testing method. Another study reports treating GDM with diet and exercise or with insulin as appropriate, may reduce serious perinatal morbidity and may improve women's health-related quality of life (5), although limited research exists which demonstrates improvements in fetal/maternal outcomes from universal screening (3)(7)(16).

The 2002 SOGC Guideline on Screening for Gestational Diabetes states that as there is not enough evidence-based data to demonstrate improved clinical outcomes after universal screening, diagnosis or treatment of GDM, various approaches are acceptable. These include: universal screening; screening on a case by case basis using risk factors and clinical findings; or not screening (1).

Note: One study introduced the "jelly bean challenge", in which 28 jelly beans were given in place of the 50 g glucose drink, with comparable results (17). Although this test was shown to be more tolerable for women, it remains questionable whether individual laboratories will accept it as an alternative test.

Nutritional and Holistic Counseling

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Midwives have the opportunity to provide holistic care with a focus on lifestyle and nutrition counseling. Our model of care highlights informed choice decision making as well as emphasizes our ability to promote natural ways of maintaining health and wellbeing. Counseling can start early in pregnancy. The health history is an important opportunity for education and discussions regarding lifestyle choices. All women can benefit from a discussion about maintaining a healthy diet and engaging in regular exercise (24). Additionally, women at higher risk of developing gestational diabetes may benefit from other dietary and natural remedies to support their body's ability to maintain normal blood sugars. These can include:

- Low glycemic diet (20)
- Frequent small meals with increased fiber and protein (23)
- Decrease carbohydrates and high starch vegetables
- Supplements including, Vitamin D, Zinc, B6, B12, folic acid, Magnesium, Vitamin C, Vitamin E have been shown to have beneficial properties in controlling blood sugar (21, 22)
- Cinnamon may also increase the effectiveness of insulin and foods high in antioxidants support and maintain overall health
- Stress reduction

(Adapted from presentation by Cathy Calson-Rink, ND RM)

Guideline for Screening

1. At the Intake appointment, counsel all women regarding diet and exercise and consider A1C or Random Glucose testing for women at high risk for type II Diabetes.
2. At 22-26 weeks GA, an informed choice discussion regarding GDM and screening/diagnostic tests is recommended including a review of diet and exercise. GDM screening is *most reliable* when done between 24-28 weeks.
3. Given the lack of adequate evidence regarding best practice for GDM screening in low risk women, an informed choice discussion with clients is recommended, reviewing the approaches below. The IADPSG recommendations should be considered critically as causal relationship between diagnosis of GDM with positive 75g OGTT and adverse perinatal outcomes cannot be demonstrated.

Current Recommendations	
SOGC (2002)	Perinatal Services BC (2010)
No single approach recommended due to lack of clear evidence.	IADPSG recommendations (2010) (as follows)
Routine screening 24-28w with 50g OGCT, threshold 7.8mmol/L, except in low risk women.	Eliminate 50g OGCT
75 or 100g OGTT for positive 50g OGCT.	Universal screening with 75g OGTT. Diagnosis of GDM with 1 value over threshold: - fasting PG 5.0 mmol/L - 1h PG 10.0 mmol/L - 2h PG 8.5 mmol/L
75g OGTT at 6-12w postpartum for women with GDM diagnosis.	In all or only high risk women: FPG, or random PG, or HbA1C with initial bloodwork. Overt diabetes if: - A1C >/= 6.5 any time in pregnancy - FPG >/= 7.0 mmol/L - random PG >/= 11.1 mmol/L if reconfirmed by FPG or A1C.

4. Consult to endocrinologist, i.e. BCWH Diabetes Clinic, with positive 75g OGTT (8).
5. If diet and exercise therapy do not result in maintenance of normal plasma glucose levels and insulin therapy is required, a consult to an Obstetrician is recommended by the College of Midwives of BC (8).

Prenatal care for clients diagnosed with diet controlled GDM

- Prenatal care remains the same as for other clients as long as there is no underlying disease such as hypertension.
- GDM pregnancies should follow normal post dates management. GDM is not an indication for early induction or caesarean section (9)(10). Consideration should be given, however, to delivering by 40 weeks in women with GDM and gestational hypertension as they have shown an increased risk of perinatal mortality as compared to low risk women (11).

Intrapartum care for clients diagnosed with diet controlled GDM

Management of labour is basically the same as managing an uncomplicated term labour. BCWH and SPH both have policies and standing orders regarding intrapartum management of glucose intolerance, which should be followed. These include:

- If IV fluids are necessary, a glucose mixture should not be used (10)(12). Of note, the BCWH policy on intrapartum care with GDM recommends D5W if ketones are present in a urine sample.
- Check plasma glucose levels q4 hourly, if PG levels were monitored prenatally; with consultation to Obstetrics, administer insulin for elevated PG.
- Continuous EFM
- Prepare for increased possibility of shoulder dystocia and postpartum hemorrhage (10)(12).

Care of the neonate born to clients diagnosed with GDM

- Discuss increased risk for hypoglycemia in the newborn with mother, prenatally and after the birth.
- Recommend breastfeeding as soon as possible after birth. Consider supplementing with EBM/donor EBM/formula as needed.
- Check plasma glucose of newborn at 2 and 6 hours of life; for hypoglycemia of (< 2.4) treat per protocol with supplementation and retest after 30 minutes.
- If newborn is hypoglycemic following supplementation for abnormal 2 or 6h PG, or if symptomatic following feeding, consider consultation with a Pediatrician.
- If newborn is asymptomatic, discuss signs and symptoms of hypoglycemia (poor feeding, lethargy, not waking to feed, jittery, tachypnea, apneas), importance of frequent feeding and when to page the midwife on call.

Postpartum care for clients diagnosed with GDM

- Arrange follow-up at 6-12 weeks postpartum to reassess fasting blood sugar and 75g OGTT to determine if at risk for diabetes (1).
- Educate regarding lifestyle changes to reduce future risk, including maintaining body weight within normal range, and increasing physical activity (9).
- Refer client to her family physician for ongoing assessment.

Benefits/Risks of Screening and Diagnosis

- Women diagnosed with gestational diabetes are at increased risk of developing diabetes later in life. This awareness can motivate healthy lifestyle changes.
- Monitoring, diet and lifestyle changes are very useful in attaining more stable blood glucose, and may result in reducing GDM related risks (5).
- The OGCT and OGTT may be unpleasant for many women, especially those who consume little refined sugar in their diets. Some women may experience nausea, vomiting and/or headache, although these symptoms should resolve soon after taking the test and resuming a normal diet.
- Women diagnosed with GDM may be perceived as “high risk” and as a result may be at increased risk of interventions during pregnancy, labour and delivery (3)(13)(14).

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