CLINICAL PRACTICE GUIDELINE

No. 334 (Replaces No. #121, November 2002)

Diabetes in Pregnancy

This Clinical Practice Guideline has been prepared by the Maternal Fetal Medicine Committee; reviewed by the Family Physicians Advisory, Aboriginal Health Initiative, and Clinical Practice – Obstetrics Guideline Committees and the Canadian Diabetes Association; endorsed by the Canadian Diabetes Association; and approved by the Board of the Society of Obstetricians and Gynaecologists of Canada.

PRINCIPAL AUTHORS

Howard Berger, MD, Toronto ON

Robert Gagnon, MD, Montreal QC

Mathew Sermer, MD, Toronto ON

MATERNAL FETAL MEDICINE COMMITTEE

Melanie Basso, RN, Vancouver BC

Hayley Bos, MD, Victoria BC

Richard N. Brown, MD, Beaconsfield QC

Emmanuel Bujold, MD, Quebec QC

Stephanie L. Cooper, MD, Calgary AB

Robert Gagnon, MD, Montreal QC

Katy Gouin, MD, Quebec QC

N. Lynne McLeod, MD, Halifax NS

Savas M. Menticoglou, MD, Winnipeg MB

William R. Mundle, MD, Windsor ON

Anne Roggensack, MD, Calgary AB

Frank L. Sanderson, MD, Saint John NL

Jennifer D. Walsh, MD, Rothesay NB

Disclosure statements have been received from all members of the committee(s).

Key Words: Diabetes, pregnancy, stillbirth

http://dx.doi.org/10.1016/j.jogc.2016.04.002

J Obstet Gynaecol Can 2016;■(■):1–13

Abstract

Objective: This guideline reviews the evidence relating to the diagnosis and obstetrical management of diabetes in pregnancy.

Outcomes: The outcomes evaluated were short- and long-term maternal outcomes, including preeclampsia, Caesarean section, future diabetes, and other cardiovascular complications, and fetal outcomes, including congenital anomalies, stillbirth, macrosomia, birth trauma, hypoglycemia, and long-term effects.

Evidence: Published literature was retrieved through searches of PubMed and the Cochrane Library using appropriate controlled vocabulary (MeSH terms "diabetes" and "pregnancy"). Where appropriate, results were restricted to systematic reviews, randomized control trials/controlled clinical trials, and observational studies. There were no date limits, but results were limited to English or French language materials.

Values: The quality of evidence was rated using the criteria described in the Report of the Canadian Task Force on Preventive Health Care (Table 1).

Summary Statements

1. The adverse outcomes associated with diabetes in pregnancy are substantially associated with hyperglycemia and the coexisting metabolic environment. Women with preexisting diabetes should receive preconception care to optimize blood sugar control and other comorbidities. Outcomes for the fetus/neonate and the mother in both pre-gestational diabetes mellitus and gestational diabetes mellitus pregnancies are improved by multidisciplinary management in which the goal is achieving optimal blood sugar control and appropriate fetal surveillance. (II-2)
2. Retrospective studies indicate that women with pre-gestational diabetes mellitus have an increased risk of stillbirth before 40 weeks' gestation compared with the general obstetrical population. Similarly, large recent cohort and simulation studies of women with gestational diabetes mellitus pregnancies also indicate a higher risk of stillbirth between 36 to 39 weeks' gestation. (II-2)
3. Women with gestational diabetes mellitus have a higher risk of preeclampsia, shoulder dystocia, Caesarean section, and large for gestational age infants. (II-2)
4. Treatment of women with gestational diabetes mellitus and optimization of glycemic control reduce the risk of preeclampsia, shoulder dystocia, and large for gestational age infants. (I)
5. The occurrence of gestational diabetes mellitus increases the risk of developing type 2 diabetes in the future for the mother. (II-2)

Table 1. Key to evidence statements and grading of recommendations, using the ranking of the Canadian Task Force on Preventative Health Care

Quality of evidence assessment*	Classification of recommendations†
I Evidence obtained from at least one properly randomized controlled trial	A. There is good evidence to recommend the clinical preventive action
II-1 Evidence from well-designed controlled trials without randomization	B. There is fair evidence to recommend the clinical preventive action
II-2 Evidence from well-designed cohort (prospective or retrospective) or case-control studies, preferably from more than one centre or research group	C. The existing evidence is conflicting and does not allow to make a recommendation for or against use of the clinical preventive action; however, other factors may influence decision-making
II-3 Evidence obtained from comparisons between times or places with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of treatment with penicillin in the 1940s) could also be included in the category	D. There is fair evidence to recommend against the clinical preventive action
III Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees	E. There is good evidence to recommend against the clinical preventive action
	F. There is insufficient evidence (in quantity or quality) to make a recommendation; however, other factors may influence decision-making

*The quality of evidence reported in these guidelines has been adapted from The Evaluation of Evidence criteria described in the Canadian Task Force on Preventive Health Care.

†Recommendations included in these guidelines have been adapted from the Classification of Recommendations criteria described in The Canadian Task Force on Preventive Health Care.

Woolf SH, Battista RN, Angerson GM, Logan AG, Eel W. Canadian Task Force on Preventive Health Care. New grades for recommendations from the Canadian Task Force on Preventive Health Care. CMAJ 2003;169:207e8.

Recommendations

1. The "preferred screening and diagnostic 2-step" approach for gestational diabetes mellitus of the Canadian Diabetes Association 2013 guidelines is endorsed. All pregnant women should be offered screening between 24 to 28 weeks using a standardized non-fasting 50-g glucose challenge screening test with plasma glucose measured 1 hour later. (III-B)

   1.1. If the value is $<$ 7.8 mmol/L, no further testing is required.

   1.2. If the value of the glucose challenge screening test is 7.8 to 11.0, a 2-hour 75-g oral glucose tolerance test with fasting plasma glucose, 1-hour plasma glucose, and 2-hour plasma glucose should be performed.

   Gestational diabetes mellitus is diagnosed if 1 value is met or exceeded:

   i. Fasting plasma glucose $\geq$ 5.3 mmol/L

   ii. 1-hour plasma glucose $\geq$ 10.6 mmol/L

   iii. 2-hour plasma glucose $\geq$ 9.0 mmol/L

   1.3. If the value of the glucose challenge screening test is $\geq$ 11.1 mmol/L, gestational diabetes mellitus is diagnosed.

2. The "alternative 1-step diagnostic" approach of the Canadian Diabetes Association 2013 guidelines is acceptable. In this strategy pregnant women should be offered testing between 24 to 28 weeks using a standardized 2-hour 75-g oral glucose tolerance test with fasting plasma glucose, 1-hour plasma glucose, and 2-hour plasma glucose. (III-B)

   Gestational diabetes mellitus is diagnosed if 1 value is met or exceeded:

   i. Fasting plasma glucose $\geq$ 5.1 mmol/L

   ii. 1-hour plasma glucose $\geq$ 10.0 mmol/L

   iii. 2-hour plasma glucose $\geq$ 8.5 mmol/L It is recognized that the use of different diagnostic thresholds for the "preferred" and "alternative" strategies could cause confusion in certain settings. Despite this, the committee has identified the importance of remaining aligned with the current Canadian Diabetes Association 2013 guidelines as being a priority. It is thus recommended that each care centre strategically align with 1 of the 2 strategies and implement protocols to ensure consistent and uniform reporting of test results.

3. If there is a high risk of gestational diabetes mellitus based on multiple risk factors, screening or testing should be offered during the first half of the pregnancy and repeated at 24 to 28 weeks' gestation if initially normal. If for any reason it was missed or if there is a clinical suspicion of later onset of gestational diabetes, a screening or diagnostic test should be performed. (II-2B)

4. Women with preexisting or gestational diabetes mellitus should be provided with care by a multidisciplinary team aimed at attaining and then maintaining euglycemia. (II-2B)

ABBREVIATIONS

ACOG	American College of Obstetricians and Gynecologists
BMI	body mass index
CDA	Canadian Diabetes Association
DM	diabetes mellitus
FPG	fasting plasma glucose
GCT	glucose challenge screening test
GDM	gestational diabetes mellitus
HAPO	Hyperglycemia and Adverse Pregnancy Outcome
IADPSG	International Association of Diabetes and Pregnancy Study Groups
LGA	large for gestational age
NST	non-stress test
OGTT	oral glucose tolerance test
PG	plasma glucose
PGDM	pre-gestational diabetes mellitus
RR	relative risk
SMBG	self-monitored blood glucose