



CANADIAN *diabetes*

Diabetes in Pregnancy: International Recommendations Provide an Opportunity for Improved Care

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EDITORS' NOTE

Diabetes in pregnancy has been the subject of recent major international guidelines for screening, diagnosis and management, some of which have suggested changes to previous guidelines. In 2009, the International Diabetes Federation (IDF) introduced the *Global Guideline on Pregnancy and Diabetes* (1). The International Association of Diabetes and Pregnancy Study Groups (IADPSG) was initially formed to help manage the international Hyperglycemia and Adverse Pregnancy Outcome (HAPO) trial, and was subsequently expanded to include countries not involved in that study, in an attempt to reach worldwide consensus on consistent methods of screening, diagnosis and classification of gestational diabetes mellitus (GDM). Their recommendations were also published recently (2).

The primary purpose of addressing these issues is to raise awareness of the importance of diagnosing and appropriately treating women with any form of diabetes in pregnancy. In the 2008 Canadian Diabetes Association (CDA) clinical practice guidelines (3), there was recognition that postpartum evaluation of these women falls far short of guideline recommendations (often only 20 to 30%, rather than the desired 100%), and thus represents an area that should be addressed aggressively. Over the next 6 months, as part of the CDA's guidelines implementation initiative, numerous community and healthcare system alerts will be released to educate women who have had GDM, as well as any healthcare professional with whom they interact, about the importance of postpartum follow-up. This issue of *Canadian Diabetes* puts this need in perspective.

On page 3, Dr. Denice Feig compares the CDA and IDF guidelines, wherein she highlights an important issue, i.e. the need for optimal glycemic control prior to and during pregnancy, especially in light of the increasing number of pregnant women who

may have undiagnosed type 2 diabetes, or who have a pregnancy complicated by GDM (4). It is crucial that women with type 2 diabetes be diagnosed, as pre-pregnancy planning is as important to them as it is for women with type 1 diabetes. It is also key that women understand *why* they should strive for optimal glycemic control prior to pregnancy, i.e. to avoid pregnancy loss and congenital abnormalities in their offspring. Thus, clinicians must use every interaction with women who have any form of diabetes in their reproductive years to raise awareness, confirm appropriate birth control protection and help them plan their pregnancies. For women with diabetes, pre-pregnancy planning includes folic acid supplementation; discontinuation of angiotensin-converting enzyme inhibitors, angiotensin-receptor blockers and statins; and evaluation for retinal changes or any evidence of nephropathic, neuropathic or cardiovascular (CV) complications. Women who are well-controlled on oral antihyperglycemic agents (metformin and/or glyburide) should ideally be converted to the use of insulin and establish good control on their insulin regimen prior to pregnancy.

In Canada, whenever possible, pregnant women should be seen by an interdisciplinary healthcare team that specializes in diabetes and pregnancy. During pregnancy, the CDA guidelines offer specific recommendations for glycemic control, including pre-meal adjustments in type 1 diabetes and post-meal adjustments in type 2 diabetes and GDM. Both the IDF and CDA guidelines emphasize the importance of postpartum assessments, with the CDA noting the importance of follow-up for retinal changes in the year following pregnancy

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We are conducting a brief survey to ensure that *Canadian Diabetes* continues to meet the needs of our readers, as well as ensuring that we are providing useful and valuable information on the subject of diabetes. The survey will take a few moments to complete and can be faxed back to the Canadian Diabetes Association offices (416-363-7465). Alternatively, you can complete the survey on-line by visiting www.diabetes.ca/for-professionals/resources/publications. Thank you for your contribution to *Canadian Diabetes*.

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- Other: _____

11. Can you identify the key advertisers with *Canadian Diabetes*?

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The International Diabetes Federation Guidelines in Pregnancy: How do They Compare with the Canadian Diabetes Association Guidelines?

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In October 2009, the International Diabetes Federation published the *Global Guideline on Pregnancy and Diabetes* (1). This article will help readers understand the similarities and differences between the IDF guideline and the Canadian Diabetes Association (CDA) 2008 clinical practice guidelines (2), particularly with respect to management of women with pregestational diabetes in pregnancy.

While the previous 2005 IDF guideline contained a section on type 2 diabetes and pregnancy, it did not address the management of women with type 1 diabetes. As well, in this iteration, IDF members wished to address wider issues for women with gestational diabetes mellitus (GDM) and prevention of diabetes. Comments in this paper will be limited to the management of women with pregestational diabetes.

Both the IDF and the CDA guidelines' pregnancy chapter were written by experts in the area of diabetes in pregnancy; however, given the mandate of the IDF, they were able to gather an impressive group of experts from around the world, from both developed and developing countries. While the IDF recommendations were based on evidence cited in the text of the document, the CDA guidelines are more transparent in their process in that each CDA recommendation is based upon existing literature, and is graded and assigned a level of evidence.

The first IDF recommendation deals with pre-pregnancy counselling and notes that "for all fertile women of child-bearing age with diabetes," one must "identify the possibility of pregnancy by direct questioning on every relevant occasion" and provide contraceptive advice where appropriate (1). The CDA also advises pre-pregnancy counselling; however, the need for direct questioning on every relevant occasion, as stated in the IDF recommendations,

is critical to the issue of pre-pregnancy counselling. At every encounter we have with women of child-bearing age who have diabetes, the opportunity must be taken to ensure the patient has contraception when needed, to avoid the increased risk of congenital anomalies seen with unplanned pregnancies and uncontrolled hyperglycemia.

OPTIMIZING GLYCEMIC CONTROL

With respect to ideal glycemic control needed in the pregnancy planning or pre-conception period, the IDF recommends a pre-conception target A1C <6.5%, or <7.0% if on insulin, while actively discouraging women with A1C above 8.0% from becoming pregnant until their glycemic control has improved. The CDA recommends that women strive to attain a pre-conception A1C of <7.0%, or <6.0% if achievable. As indicated in the CDA guidelines, there are numerous reasons to achieve this A1C, including decreased risk of spontaneous abortions, congenital anomalies, preeclampsia and progression of retinopathy. In a study of 138 women with type 1 diabetes in France, 85% stated they had received pre-pregnancy counselling, while only 52% were aware of the risk of congenital anomalies. Thus, we may be communicating the importance of good glycemic control to our patients, but the reason for its importance is still not completely understood

Canadian Diabetes / Le Diabète au Canada Spring 2010

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Change of address notices to:
Canadian Diabetes Association
1400-522 University Avenue
Toronto, Ontario M5G 2R5

Canada Post Publication agreement number 40063447.

ISSN0841-9388

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by them. If the reason for excellent glycemic control at conception was clearer, perhaps we would see better compliance with these guidelines.

PHARMACOTHERAPY CONSIDERATIONS

In Canada, the prevalence of type 2 diabetes in pregnancy is rising (3), and clinicians are increasingly faced with women who are on oral antihyperglycemic agents (OHAs) and are planning pregnancies or have an unplanned pregnancy. While the CDA recommends that women with type 2 diabetes who are planning a pregnancy or to become pregnant should switch from OHAs to insulin, preferably pre-pregnancy, an exception may be the setting of polycystic ovary syndrome, where metformin may be used to induce ovulation. By contrast, the IDF advises discussion of the advantages and theoretical risks of OHAs, and recommends insulin only "where appropriate." In the situation of women with type 2 diabetes planning pregnancy, while ideally they should switch to insulin, the reality is that OHAs are convenient and less expensive, and women with excellent glycemic control may prefer to receive the data on the advantages and risks of OHAs, and then make their own decision. In Canada, the use of both metformin and glyburide in pregnancy is still considered "off label" and clinicians should obtain written informed consent prior to its use. Clearly, in both guidelines, women who do not have optimal glycemic control on OHAs should switch to insulin pre-pregnancy.

The CDA recommends that women who have an unplanned pregnancy should switch to insulin; however, the IDF states "be prepared to change from oral glucose-lowering agents to insulin, if required." The evidence is lacking for the continuation of OHAs throughout pregnancy in women with type 2 diabetes, and the use of sulfonylureas has been associated with increased perinatal mortality (4). However, the evidence to date indicates that metformin and glyburide are not likely teratogenic when used early in pregnancy (5). Therefore, for women who have an unplanned pregnancy while on OHAs, it is critical that physicians not discontinue these agents prior to initiating insulin. The hyperglycemia experienced if they stop OHAs before initiating insulin is teratogenic, while the medications themselves are not.

Both the IDF and the CDA recommend the discontinuation of potentially teratogenic drugs prior to conception, including angiotensin-converting enzyme inhibitors, angiotensin-receptor blockers and statins. They both also recommend clarifying thyroid status, folic acid supplementation in early gestation and assessment of diabetes complications, whenever possible, prior

to or very early in pregnancy. The CDA is more specific in their recommendation of 5 mg of folic acid pre-pregnancy to be continued up to 12 weeks, an ophthalmic evaluation by an eye care specialist, and screening for nephropathy pre-pregnancy. The CDA also recommends the following antihypertensive agents may be used pre-pregnancy and during pregnancy: calcium

channel blockers, beta blockers, labetalol, hydralazine and methyldopa.

The IDF offers advice regarding what is to be done during the first prenatal visit. If the woman has had pre-pregnancy counselling, then a review of management of diabetes during pregnancy, current drug therapy, blood glucose (BG) control, diabetes compli-

Table 1. Comparison of the CDA and IDF guidelines for diabetes in pregnancy		
Area of interest	CDA recommendation	IDF recommendation
Mandate	<ul style="list-style-type: none"> National, with transparent process Evidence-based, with recommendations supported by graded literature 	<ul style="list-style-type: none"> International, with experts from developed and developing countries Recommendations supported by literature but not graded
Pre-conception A1C target	<ul style="list-style-type: none"> <7.0%, or <6.0% if achievable 	<ul style="list-style-type: none"> <6.5%, or <7.0% if on insulin Actively discourage pregnancy if above 8.0%
Women on OHAs who are planning pregnancy	<ul style="list-style-type: none"> Switch from OHAs to insulin, preferably pre-pregnancy, except in the setting of polycystic ovary syndrome, where metformin may be used for ovulation induction 	<ul style="list-style-type: none"> Discuss advantages and theoretical risks of OHAs Start insulin where appropriate
Women on OHAs who have an unplanned pregnancy	<ul style="list-style-type: none"> Switch to insulin 	<ul style="list-style-type: none"> Be prepared to change from OHAs to insulin, if required
SMBG in pregnancy	<ul style="list-style-type: none"> Women should perform SMBG pre- and post-prandially to achieve glycemic targets 	<ul style="list-style-type: none"> SMBG should be done frequently The frequency will relate to their previous pattern of testing and type of insulin regimen
Glucose targets in pregnancy	<ul style="list-style-type: none"> No A1C targets specified BG: <ul style="list-style-type: none"> Fasting: 3.8–5.2 mmol/L 1-h postprandial : 5.5–7.7 mmol/L 2-h postprandial 5.0–6.6 mmol/L 	<ul style="list-style-type: none"> A1C <6.0% No BG targets specified
Assessment of retinopathy during pregnancy	<ul style="list-style-type: none"> First trimester, by an eye care specialist As needed during the remainder of pregnancy and within the first year postpartum 	<ul style="list-style-type: none"> At the first visit and each trimester
Use of metformin and glyburide during lactation	<ul style="list-style-type: none"> Stated in text, not a recommendation: <ul style="list-style-type: none"> Metformin and glyburide may be considered for use during breastfeeding, although further long-term studies are needed to better clarify the safety of these drugs 	<ul style="list-style-type: none"> Metformin, and possibly glyburide, may be used

A1C = glycated hemoglobin

BG = blood glucose

CDA = Canadian Diabetes Association

IDF = International Diabetes Federation

OHA = oral antihyperglycemic agent

SMBG = self-monitoring of blood glucose

cations and presence of other medical conditions is advised. If the woman missed pre-pregnancy counselling, they recommend doing an A1C as soon as is practical, and offering advice on the risks on the basis of the result. The CDA does not offer specific advice regarding the first prenatal visit; however, they are more specific in recommending that care be given by an interdisciplinary diabetes healthcare team composed of diabetes nurse educators, dietitians, obstetricians and endocrinologists, both prior to conception and during pregnancy, to minimize maternal and fetal risks.

The IDF advises discussion of the advantages and theoretical risks of OHAs, and recommends insulin only “where appropriate.”

For ongoing management, both the IDF and CDA recommend that the patient receive nutritional counselling from an expert in medical nutrition therapy. The IDF encourages physical activity, “tailoring advice to the previous exercise habits of the individual” (1). The CDA encourages physical activity, but does not specifically advise on physical activity in their recommendations (2).

Regarding Self-monitoring of blood glucose (SMBG), the CDA recommends that all women perform both pre- and postprandial BG tests to achieve glycemic targets (2), while the IDF suggests that SMBG should be done frequently and the frequency “will relate to their previous pattern of testing and type of insulin regimen” (1). The CDA recommends BG targets during pregnancy (fasting: 3.8–5.2 mmol/L; 1-h postprandial: 5.5–7.7 mmol/L; 2-h postprandial: 5.0–6.6 mmol/L), and does not make A1C recommendations; the IDF recommends an A1C of 6.0%, or lower if it can be safely achieved, but does not state glycemic targets.

RETINOPATHY

Both the CDA and IDF recommend assessment of retinopathy during pregnancy. The IDF recommends an eye examination at the first visit and at each trimester (they do not specify who should conduct this test), while the CDA recommends that women be

evaluated by an eye care specialist during the first trimester, and as needed during the remainder of pregnancy and within the first year postpartum. The latter recommendation is an important one, since a recent study found that retinopathy can continue to progress up to 1 year postpartum (6).

BREASTFEEDING

Finally, breastfeeding is encouraged by both groups. With respect to OHAs and breastfeeding, the IDF states that “metformin and possibly glyburide may be used,” while the CDA states in their text (not as a recommendation) that “metformin and glyburide can be considered for use during breastfeeding, although further long-term studies are needed to better clarify the safety of these drugs.” (2)

CONCLUSION

In summary, while there are some minor differences between the CDA and IDF recommendations, similarities abound. Both guidelines can help clinicians improve maternal and fetal outcomes of their patients.

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Gestational Diabetes Mellitus: Time to Change our Approach to Screening, Diagnosis and Postpartum Care?

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There is much confusion internationally regarding the optimal method of diagnosing gestational diabetes mellitus (GDM). In an effort to resolve this conundrum, the large, multicentre Hyperglycemia and Adverse Pregnancy Outcome (HAPO) trial was undertaken (1).

The HAPO study demonstrated a strong, continuous and positive association between maternal glucose and increased birth weight and fetal hyperinsulinemia at levels below the current Canadian Diabetes Association (CDA) guidelines, diagnostic thresholds for GDM. However, no obvious glucose thresholds were found for fetal overgrowth and a variety of other maternal and neonatal outcomes. Thus, controversy continues to surround appropriate diagnostic thresholds for GDM. The daunting task of finding international consensus for GDM diagnosis has been spearheaded by the International Association of Diabetes and Pregnancy Study Groups (IADPSG). This group was initially formed through the efforts of various study groups around the world, to facilitate the HAPO study. The Canadian Diabetes in Pregnancy Study group (CanDIPS) also joined the IADPSG and contributed to deliberations regarding diagnostic criteria for GDM at conferences, and in working and writing groups. The IADPSG guidelines were published recently in the journal *Diabetes Care* (2).

The objectives of this article are to: introduce the IADPSG guidelines; highlight the key differences between them and the current CDA guidelines; discuss the impact of implementing the IADPSG recommendations in Canada; and emphasize the importance of postpartum follow-up of women with GDM.

SCREENING AND DIAGNOSTIC TESTING FOR GDM **Key differences and impact of the IADPSG guidelines for Canada**

Identification of overt diabetes first diagnosed during pregnancy

There has been an alarming increase in the prevalence of type 2 diabetes in women of reproductive age. Diabetes screening in high-risk individuals should occur prior to conception, so that women with diabetes are referred to appropriate resources for optimal blood glucose (BG) control prior to conception. Sadly, the extent to which type 2 diabetes is identified prior to pregnancy varies greatly worldwide, in part because it depends on the patient's ability to pay for this service in many countries. Thus, the proportion of patients with previously undiagnosed type 2 diabetes who are currently classified as having GDM varies widely worldwide, and this limits our ability to compare different studies. If pre-conception diabetes screening has not occurred, the IADPSG recommendations for diagnosing overt diabetes listed in Table 1 should be performed immediately after the pregnancy is confirmed. By screening for overt diabetes and excluding these patients from a diagnosis of GDM, it will be easier to compare studies. Further research is required to determine the most appropriate test and thresholds for diagnosing overt diabetes during pregnancy.

If we fail to exclude overt diabetes in pregnancy from GDM, we risk inadequate care of patients with overt diabetes, who carry a

Table 1: Current CDA and IADPSG recommendations

Diagnostic criteria	CDA recommendations	IADPSG recommendations
Screening	<ul style="list-style-type: none"> In women at high risk in their first trimester, and in all women at 24–28 weeks pregnant, do a 50-g glucose screen followed by 1-h PG If 1-h PG: <ul style="list-style-type: none"> <7.8 mmol/L: normal; retest only if risk factors increase 7.8–10.2 mmol/L: perform an OGTT ≥10.3 mmol/L: diagnosis is GDM 	<ul style="list-style-type: none"> 50g glucose screen eliminated
Diagnostic test	75-g OGTT	75-g OGTT
Thresholds		
Fasting PG	5.3 mmol/L	5.1 mmol/L
1-h PG	10.6 mmol/L	10.0 mmol/L
2-h PG	8.9 mmol/L	8.5 mmol/L
GDM diagnosed if ...	2 values ≥ thresholds	1 value ≥ thresholds
IGT	1 value ≥ thresholds	diagnosis eliminated
Identification of overt diabetes	<ul style="list-style-type: none"> Not diagnosed until postpartum test done 	In all or only high-risk women* measured FPG or random PG or A1C with first prenatal bloods. Overt diabetes diagnosed if: <ul style="list-style-type: none"> A1C ≥6.5% at any time in pregnancy. FPG ≥7.0 mmol/L. Random PG ≥11.1 mmol/L if reconfirmed by FPG or A1C

* Recommendation for population to be screened should be determined based on local or national risk for diabetes

A1C = glycated hemoglobin

CDA = Canadian Diabetes Association

FPG = fasting plasma glucose

GDM = gestational diabetes mellitus

IADPSG = International Association of the Diabetes and Pregnancy Study Groups

IGT = impaired glucose tolerance

OGTT = oral glucose tolerance test

PG = plasma glucose

much greater risk of maternal hypertension, neonatal congenital malformations and stillbirth; we also risk unnecessarily aggressive care of GDM patients who have much lower risks of these complications.

Elimination of gestational impaired glucose tolerance

One or more elevated plasma glucose (PG) results on an oral glucose tolerance test (OGTT) in pregnancy is a predictor for future increased risk of diabetes in the affected woman as well as for neonatal macrosomia, especially if isolated fasting glucose is observed (3). This IADPSG recommendation will increase the number of women officially diagnosed with GDM. The impact of this recommendation will likely be small, since many Canadian

centres provide similar management to women with GDM and gestational impaired glucose tolerance (IGT).

One single glucose load test

There is no evidence that a single glucose test for GDM will be any more or less effective for influencing maternal or neonatal outcomes of GDM. Elimination of the simpler 1-h 50-g glucose screening could result in the delay of pregnant women being tested for GDM. A single-step test may result in earlier diagnosis and treatment of women with GDM. In an urban Canadian centre, Meltzer and colleagues demonstrated that cost analysis favoured the 2-step approach when direct patient expense was included in their analysis, except where very high-risk ethnic groups were involved (4).

Lower glycemic thresholds for a diagnosis of GDM

Implementation of IADPSG thresholds would mean that a significantly greater proportion of women would be diagnosed with GDM. HAPO data suggest this could approach 17.8% of pregnant women, compared with approximately 8% if GDM and gestational IGT presently diagnosed are considered. IADPSG thresholds are the maternal glucose values from HAPO associated with a 1.75-fold increase of large-for-gestational age, elevated C-peptide, high neonatal body fat or a combination of these factors, compared with the mean maternal BG values of women studied. Randomized controlled trials in GDM suggest that rates of macrosomia, maternal weight gain, shoulder dystocia and hypertension in pregnancy should be reduced by glycemic management of women diagnosed at IADPSG thresholds (5,6).

The most compelling reason to reject IADPSG thresholds stems from the recognition that the outcomes upon which they are based are not necessarily serious negative outcomes. Rather, they are surrogate markers for other key clinical outcomes, i.e. future poor metabolic outcomes in offspring, and neurologic complications resulting from birth trauma. Randomized controlled trials in GDM have not had sufficient power to assess serious outcomes independently, nor has there been long-term follow-up of the offspring of the women involved in these studies, apart from a small Canadian study. Malcolm and colleagues showed that tight maternal glycemic control of GDM compared with minimal intervention did not reduce rates of glucose intolerance in offspring at ages 7 to 11 years, and there was an insignificant trend for more abnormal glucose tolerance in the treated group (9% [5/47]) vs. the control group (0% [0/25]) (7). Given the small sample size and incomplete follow-up in this study, it is difficult to draw definitive conclusions.

Offspring exposed to maternal dysglycemia in utero have increased risk of poor metabolic outcomes later in life (7). However, the relative causal contributions of genetic/epigenetic factors, in utero glycemic/nutritional environment, early infant feeding choices and lifestyle factors in the home remain speculative. Experimental human data showing that alterations in maternal glycemia can modify the offspring's future risk of poor metabolic outcomes are lacking, despite epidemiologic data in humans and experimental animal data that support this hypothesis (8,9).

No one would dispute that the incidence of type 2 diabetes is increasing rapidly and that the development of a novel intervention to reverse this trend is urgently desired. The hypothesis that diabetes begets diabetes by in utero exposure to maternal

hyperglycemia, and that diabetes can be reversed by treating at-risk mother-fetus pairs, is an attractive one. Many fear the consequences of not embracing this hypothesis now, especially given the decades of follow-up study required to support it. To that end, we must ask ourselves if there is any potential harm in accepting this hypothesis as true now and applying the implications that arise.

The most compelling reason to reject IADPSG thresholds stems from the recognition that the outcomes upon which they are based are not necessarily serious negative outcomes.

Other well-intentioned dietary manipulations in pregnancy have had negative long-term consequences for offspring (10). Greater maternal consumption of meat and fish in the second half of pregnancy has been linked with higher systolic blood pressure in adult offspring at 27 to 30 years of age (10). An excess of small-for-gestational-age (SGA) neonates has occurred when excessively strict mean BG levels have been achieved in GDM (11). SGA is also associated with poor metabolic outcomes, particularly when offspring are subsequently exposed to overnutrition postnatally (12). Additionally, the diagnosis and treatment of GDM may be stressful for some women; indeed, maternal stress has been associated with poor metabolic consequences in offspring (13).

If we accept the IADPSG thresholds, then we must ensure that medical practices which may increase long-term risks—i.e. maternal stress, rates of SGA neonates, and breastfeeding failure, resulting from higher rates of early infant separation and unnecessary caesarean-section deliveries—are avoided when women are labelled with GDM, as has occurred in the past (6,14). We must also assess how population health strategies to achieve a desirable pre-conception weight, appropriate pregnancy weight gain and use of low-dose Aspirin in women at risk of pregnancy-induced

hypertension compare with the cost of GDM management. These unanswered questions should cause us, in Canada, to pause before rushing to endorse or implement the IADPSG guidelines without careful deliberation, in conjunction with our obstetrical colleagues, of the evidence and the potential consequences.

POSTPARTUM MANAGEMENT OF WOMEN WITH A HISTORY OF GDM

Breastfeeding should be strongly encouraged in women with GDM. Research supports the beneficial effects of breastfeeding in reducing the long-term risk of obesity in offspring and maternal risk of metabolic syndrome (15).

Postpartum testing of women with GDM is required to clarify glucose tolerance outside of pregnancy, so that appropriate recommendations about prevention or treatment of diabetes are provided. This is particularly important in women who go on to have future pregnancies and have persistent diabetes or develop diabetes pre-conception, so as not to miss the opportunity to intervene and prevent congenital malformations in their offspring. The cumulative risk for dysglycemia after a diagnosis of GDM approaches 90% in some populations. Unfortunately, many women do not receive adequate postpartum care, perhaps because it is not clear who “owns” the problem: the patient, the primary care physician, the obstetrician or the diabetes-in-pregnancy team. Postnatal FPG alone may miss up to half of the woman with diabetes and virtually all those with IGT (16). The CDA sub-committee for the dissemination and implementation of clinical practice guidelines has developed tools for patients and doctors to assist in prompting postpartum testing, which were released in Spring 2010. Let’s all use these tools and seize the opportunity to prevent diabetes, diabetes-related complications and congenital malformations.

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EDITORS' NOTE...CONTINUED FROM PAGE 1

in women with pre-existing diabetes. Both guidelines support the advantages of breastfeeding in these women, for their own health and to decrease obesity in their at-risk offspring.

On page 7, Dr. Lois Donovan guides us through the IADPSG recommendations, which may lead to changes in clinical practice, if adopted. A major recommendation is that not every woman who develops diabetes in pregnancy requires the postpartum test to clarify her status. The recommendations suggest that the same criteria be used to diagnose type 2 diabetes in pregnancy as well as outside of pregnancy, and include a standardized A1C level above 6.5%. As well, a recommendation is made that every woman undergo a glucose evaluation with her first-trimester blood tests. This ideally would include a fasting plasma glucose (FPG) or random PG if fasting is not available, as well as an A1C test. In an effort to recognize and treat any early-in-pregnancy-onset GDM, the FPG is the preferred test since a first-trimester FPG ≥ 5.1 mmol/L (i.e. above the recommended diagnostic value in the 75-g oral glucose tolerance test [OGTT]) would automatically mean she would be treated for GDM.

*In Canada, whenever possible,
pregnant women should be seen
by a specialized healthcare team.*

A more controversial aspect of the IADPSG guidelines is the recommendation that only a 75-g OGTT be used, i.e. to abandon the well-proven 50-g glucose screen. Also controversial is the new diagnostic criteria suggested (FPG > 5.1 mmol/L, 1-h PG > 10.0 mmol/L and 2-h PG > 8.5 mmol/L) and the recommendation that any single abnormal value would justify treatment. The impact this may have on the healthcare system remains to be evaluated, although a recent economic assessment would suggest that, at least in Canada, this may be an expensive option (5).

Regardless of how GDM is diagnosed, it is critical that clinicians use this opportunity to optimize glycemic control to obtain improved results for pregnant women and their offspring, immediately and in the long term (6,7). More importantly, recognition of abnormal glucose tolerance in pregnancy identifies a population of women who are at high risk for diabetes in the future (12.4 times that of the background population according to

a Canadian study), and who have associated metabolic syndrome and increased CV risk (8,9). Even women who remain normoglycemic in longer-term studies have an elevated risk of metabolic syndrome and CV risk factors (10). The offspring of women who convert to diabetes are the most at risk; thus, intervention with care in pregnancy—particularly in the long-term postpartum period—with lifestyle and any needed CV preventive care may decrease not only the risk for the woman, but also for her offspring (10).

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NOTE DE LA RÉDACTION...SUITE DE LA PAGE 16

importante, à savoir le besoin d'un contrôle optimal de la glycémie avant et pendant la grossesse, surtout que de plus en plus de femmes enceintes ignorent qu'elles souffrent de diabète de type 2 ou qu'elles présentent un DG⁴. Il faut absolument diagnostiquer le diabète de type 2 chez les femmes, car la planification d'une grossesse est aussi importante chez elles que chez les femmes atteintes de diabète de type 1. Il faut aussi que les femmes comprennent *pourquoi* elles doivent rechercher un contrôle optimal de la glycémie avant de tomber enceintes, soit pour prévenir les fausses couches et les anomalies congénitales. Les cliniciens doivent donc profiter de tous leurs contacts avec les femmes qui souffrent d'une forme quelconque de diabète pendant leurs années de reproduction pour les conscientiser, confirmer qu'elles utilisent une méthode de contraception valable et les aider à planifier les grossesses. Avant de tomber enceintes, les femmes diabétiques doivent prendre un supplément d'acide folique, abandonner le traitement par un inhibiteur de l'enzyme de conversion de l'angiotensine, un antagoniste des récepteurs de l'angiotensine ou une statine et faire l'objet d'une évaluation visant à rechercher les changements rétinien et tout signe de complications à type de néphropathie, de neuropathie ou de trouble cardiovasculaire. Les femmes chez qui les antihyperglycémiant oraux (metformine et/ou glibenclamide) contrôlent bien la glycémie devraient idéalement passer à l'insulinothérapie et s'assurer que celle-ci produit un bon contrôle avant de tomber enceintes.

Au Canada, quand c'est possible, les femmes enceintes doivent consulter une équipe de soins interdisciplinaire qui se spécialise dans le diabète chez les femmes enceintes. Les lignes directrices de l'ACD contiennent des recommandations spécifiques sur le contrôle de la glycémie pendant la grossesse, entre autres sur les ajustements qui s'imposent avant les repas en présence de diabète de type 1 et sur les ajustements qui s'imposent après les repas en présence de diabète de type 2 et de DG. Les lignes directrices de la FID et de l'ACD insistent sur l'importance de faire des évaluations dans le postpartum et l'ACD met l'accent sur l'importance du suivi des changements rétinien au cours de l'année qui suit l'accouchement chez les femmes qui présentaient un diabète avant la grossesse. Les deux ensembles de lignes directrices recommandent l'allaitement chez ces femmes, tant pour leur propre santé que pour la réduction de l'obésité chez les nouveau-nés, qui sont à risque.

Pour sa part, la D^{re} Lois Donovan (page 7) interprète pour le lecteur les recommandations de l'IADPSG, dont l'adoption pourrait modifier la pratique clinique. Selon une des principales

recommandations, toutes les femmes chez qui un diabète survient pendant la grossesse ne doivent pas nécessairement subir un test dans le postpartum pour clarifier leur état. Les recommandations indiquent que les mêmes critères doivent être utilisés pour diagnostiquer le diabète de type 2 pendant la grossesse et en dehors de l'état de grossesse, y compris un taux d'HbA_{1c} de plus de 6,5 % selon une épreuve normalisée. De plus, selon les mêmes recommandations, une évaluation de la glycémie doit être effectuée en même temps que les tests sanguins du premier trimestre de la grossesse. Cette évaluation devrait idéalement être faite à partir d'un échantillon prélevé à jeun ou, faute d'un tel échantillon, d'un échantillon aléatoire, et comporter une détermination du taux d'HbA_{1c}. Le dosage de la glycémie à jeun est préférable pour le diagnostic du DG survenant au début de la grossesse, car une glycémie à jeun de 5,1 mmol/L ou plus au premier trimestre (valeur supérieure au seuil diagnostique recommandé avec l'épreuve d'hyperglycémie provoquée après l'ingestion de 75 g de glucose) entraînerait automatiquement la mise en route d'un traitement contre le DG.

Un des aspects plus litigieux des lignes directrices de l'IADPSG est la recommandation selon laquelle seule l'épreuve d'hyperglycémie provoquée après l'ingestion de 75 g de glucose doit être utilisée et qu'il faut délaier l'épreuve de charge en glucose de 50 g, dont l'efficacité est bien démontrée. Les nouveaux critères diagnostiques prêtent également à controverse (glycémie à jeun > 5,1 mmol/L, glycémie une heure après un repas > 10,0 mmol/L et glycémie deux heures après un repas > 8,5 mmol/L), tout comme la recommandation voulant que l'obtention d'un seul résultat anormal justifie la mise en route du traitement. Les répercussions de ces recommandations sur le système de santé restent à déterminer, mais selon une récente évaluation économique, elles seraient très coûteuses, du moins au Canada⁵.

Indépendamment de la façon dont le DG est diagnostiqué, il est essentiel que les cliniciens profitent de l'occasion pour optimiser le contrôle de la glycémie afin d'améliorer le devenir des femmes enceintes et de leurs enfants, tant à court qu'à long terme⁶⁻⁷. Fait encore plus important, chez les femmes qui présentent une intolérance au glucose, il y a un risque élevé de diabète à venir (12,4 fois celui observé dans la population de référence selon une étude canadienne), en association à un risque de syndrome métabolique et de maladies cardiovasculaires^{8,9}. Des études de longue durée ont montré que le syndrome métabolique et les facteurs de risque cardiovasculaire étaient quand même courants chez les femmes dont la glycémie demeurait normale¹⁰. Les enfants

de femmes chez qui l'intolérance au glucose évolue vers un diabète sont ceux chez qui le risque est le plus élevé; par conséquent, les soins pendant la grossesse et, en particulier, longtemps après l'accouchement, ainsi que la modification du mode de vie et, au besoin, les soins visant la prévention des maladies cardiovasculaires, pourraient non seulement réduire le risque chez les femmes, mais aussi chez leurs enfants¹⁰.

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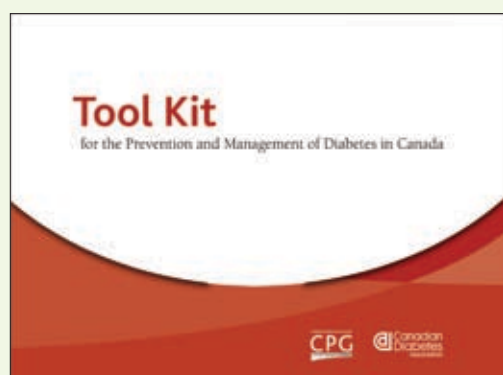
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Diabète et grossesse : l'application des recommandations internationales donne l'occasion d'améliorer les soins

Sara J. Meltzer, MD, FRCPC, et Diana Sherifali, PhD, BScN, CDE

NOTE DE LA RÉDACTION

Récemment, d'importantes recommandations internationales ont été énoncées en ce qui a trait au dépistage, au diagnostic et à la gestion du diabète pendant la grossesse, certaines étant différentes des lignes directrices antérieures. En 2009, la Fédération internationale du diabète (FID) a publié un document intitulé *Global Guideline on Diabetes in Pregnancy*¹. La participation à l'*International Association of Diabetes in Pregnancy Study Groups* (IADPSG), association qui avait d'abord été formée pour gérer l'essai international HAPO (*Hyperglycemia and Adverse Pregnancy Outcome*), a par la suite été ouverte à des pays qui n'avaient pas contribué à l'essai HAPO afin de parvenir à un consensus international sur les méthodes utilisées pour le dépistage, le diagnostic et la classification du diabète gestationnel (DG). Les recommandations de l'IADPSG ont aussi été publiées récemment².

L'examen des questions relatives au diabète pendant la grossesse a comme principal but la conscientisation sur l'importance du diagnostic et du traitement des femmes qui présentent une forme

quelconque de diabète pendant la grossesse. Dans ses lignes directrices de pratique clinique de 2008³, l'Association canadienne du diabète (ACD) reconnaissait que trop peu de femmes faisaient l'objet d'une évaluation dans le postpartum (souvent seulement 20 à 30 % d'entre elles) malgré le fait qu'une évaluation soit recommandée dans tous les cas, ce qui montre que des mesures énergiques doivent être prises pour corriger la situation. Au cours des six prochains mois, dans le cadre d'un projet de mise en application des lignes directrices de l'ACD, de nombreux avis seront diffusés à l'échelle communautaire et du système de santé pour éduquer les femmes qui ont déjà présenté un DG, ainsi que tous les professionnels de la santé qui les traitent, sur l'importance du suivi dans le postpartum. Le présent numéro de *Le diabète au Canada* replace ce besoin en contexte.

À la page 3, la D^{re} Denice Feig compare les lignes directrices de l'ACD à celles de la FID et met l'accent sur une question

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