

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

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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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