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Identifying postpartum diabetes following gestational diabetes mellitus: choosing the right test

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Which glucose test should be performed after a delivery for gestational diabetes (GDM) and when should it be done? Medical organizations differ (Table). In the next few paragraphs, we review briefly the existing evidence for specific tests and frequency of testing.

Traditionally, postpartum glucose testing is performed at the 6 weeks postpartum due to the coincident healthcare visit. However, Lawrence et al[1] have reported that fasting plasma glucose (FPG) and 2-hour glucose levels obtained prior to 6 weeks postpartum are not elevated compared to levels obtained 6–12 weeks postpartum, suggesting that earlier testing would not lead to falsely elevated values. Thereafter, frequency of testing is recommended anywhere from annually to every 3 years. While studies comparing the benefits of these 2 strategies are limited, mathematical models suggest that if FPG is employed, annual testing may yield lower costs per case, whereas if a 2-hour 75 gram oral glucose tolerance test (OGTT) is employed, every 3-year testing would yield the lowest costs per case.[2]

Regarding choice of test, the hemoglobin A1c (HbA1c) can identify individuals at risk for future diabetes and diabetes complications; is easily obtained; and has minimal intra-individual variation in persons without recent deliveries.[3] The HbA1c is not known to be influenced by breastfeeding during the actual blood draw, unlike the FPG or the OGTT.[4] Because HbA1c levels 6 weeks postpartum may be affected by perinatal hemoglobin shifts and prenatal therapies, postpartum HbA1c correlates weakly with glucose levels,[5] and the ADA has recommended it not be used at the postpartum visit.[3] Whether or not it is used at

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subsequent visits was not addressed due to relative lack of data beyond several years. Of note, the HbA1c did not improve sensitivity and specificity of FPG compared to an 75-gram 2-hour OGTT at 1-year postpartum.[6]

Thus the primary choice for postpartum glucose testing is FPG vs. OGTT. The post-challenge glucose level identifies a different population of women with glucose dysregulation than the FPG,[7] and thus the OGTT will always have greater sensitivity than FPG alone. However, the 2-hour glucose value has variability sometimes exceeding 15% within individuals,[8] and moreover presents logistical barriers compared to the FPG alone. Thus, the questions are: will more women comply with an FPG than an OGTT and what proportion of these women are consequently identified with impaired fasting glucose (IFG) or diabetes? Do these women justify missing those who have an isolated 2-hour glucose? Systematic information on who refuses an OGTT but accepts an FPG is not available. In one series, a third of women with glucose dysregulation had normal FPGs.[7] This implies that FPG alone is justified only if approximately 30% more of women with IFG are identified as a result of reduced barriers to testing posed by the FPG. Existing studies suggest that despite the additional burden posed by the OGTT, other barriers are more important.[9]

It is important to note that if less stringent i.e. lowered glucose criteria for the diagnosis of GDM are used, more women will be diagnosed with GDM. The additional women detected will have lower glucose levels and the GDM population, as a whole, will be at lower risk for postpartum diabetes. In a sense, the burden of performing a more sensitive test for glucose intolerance is shifted to the prenatal period from the postpartum period. Indeed, studies that have compared the prevalence of postpartum glucose intolerance in women identified with Carpenter and Coustan criteria vs. National Diabetes Data Group criteria have found that the prevalence of isolated impaired glucose tolerance (IGT) drops from 16% to 8%.[1] The benefit of performing a postpartum OGTT as opposed to an FPG only will subsequently be reduced. Since International Association of Diabetes and Pregnancy Study Groupcriteria identify more women with GDM than older criteria,[3] the denominator for those at risk for postpartum diabetes will be higher, and the relative benefit of OGTT vs. FPG will be lower. Of note, women diagnosed with GDM by postprandial values alone would be most likely to benefit from a postpartum OGTT.

When deciding upon a postpartum glucose testing strategy, the provider and patient should consider these questions: did the identification of GDM occur with older, less sensitive strategies, and thus is the benefit of postpartum testing and increased frequency of testing greater? Is performance of testing truly contingent upon whether an FPG vs. an OGTT is ordered? What changes will be made in the event of IFG or IGT, if any? Will the identification of glucose intolerance affect any future pregnancies in the mother? The answers will guide frequency and choice of test as we await uniformity in the guidelines for diagnosis of GDM as well as data from randomized trials and cohorts pinpointing diabetes risk.

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Table

Postpartum diabetes screening guidelines for women with histories of gestational diabetes mellitus (GDM) from the National Institute for Health and Clinical Excellence (NICE), the World Health Organization (WHO), the American Diabetes Association (ADA), the American College of Obstetrics and Gynecology (ACOG), and the Canadian Diabetes Association (CDA). OGTT indicates oral glucose tolerance test.

	NICE[13]	WHO[14]	ADA[2]	ACOG[15]
Who	All women with GDM	All women with GDM	All women with GDM	All women with GDM
When	6 weeks postpartum; If normal, annually	6 weeks postpartum	6–12 weeks postpartum If normal, every 3 years if impaired fasting glucose or elevated 2-hour glucose, annually	6–12 weeks postpartum If normal, every 3 years if impaired fasting glucose or elevated 2-hour glucose, annually
Which test	Fasting blood glucose	Fasting blood glucose or 75-g 2-hour OGTT	75-g 2-hour OGTT (Hb1c not recommended)	Fasting blood glucose or 75-g 2-hour OGTT

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