Contents lists available at ScienceDirect

Primary Care Diabetes

journal homepage: http://www.elsevier.com/locate/pcd

Review

Glucose intolerance in early postpartum in women with gestational diabetes: Who is at increased risk?

Liesbeth Leuridan[a], *Johan Wens*[b], *Roland Devlieger*[c], *Johan Verhaeghe*[c], *Chantal Mathieu*[a], *Katrien Benhalima*[a,*]

[a] *Department of Endocrinology, UZ Gasthuisberg, KU Leuven, Herestraat 49, 3000 Leuven, Belgium*
[b] *Department of Primary and Interdisciplinary Care, Centre for General Practice/Family Medicine, University of Antwerp, Universiteitsplein 1, 2610 Wilrijk, Belgium*
[c] *Department of Gynecology, UZ Gasthuisberg, KU Leuven, Herestraat 49, 3000 Leuven, Belgium*

ARTICLE INFO

Article history:
Received 17 October 2014
Received in revised form
9 March 2015
Accepted 19 March 2015
Available online 18 April 2015

Keywords:
Gestational diabetes
Glucose intolerance
Early postpartum
Risk factors
Screening

ABSTRACT

Women with a history of gestational diabetes (GDM) have an increased risk for developing type 2 diabetes in the years after the index pregnancy. Some women with GDM already develop glucose intolerance in early postpartum. The best screening strategy for glucose intolerance in early postpartum among women with a history of GDM is still debated. We review the most important risk factors of women with GDM to develop glucose intolerance within one year postpartum. We also discuss the current recommendations for screening in early postpartum and the many challenges to organize postpartum follow up in primary care.

Contents

* *Corresponding author*. Tel.: +32 16340614; fax: +32 16346989.
E-mail address: katrien.benhalima@uzleuven.be (K. Benhalima).

http://dx.doi.org/10.1016/j.pcd.2015.03.007

1. Introduction

Gestational diabetes (GDM) was historically defined as 'any degree of glucose intolerance with onset or first recognition during pregnancy' [1]. During pregnancy insulin resistance progressively increases and by the third trimester this can reach the degree of resistance seen in non-pregnant women with type 2 diabetes mellitus (T2DM). It has long been thought that the insulin resistance provided a short-term challenge to the β-cells, with GDM arising in those women whose β-cells were unable to meet this challenge. Progressively more data show now that the defect in β-cell compensation that characterizes GDM is chronic and probably not just acquired during pregnancy. Shortly after delivery the insulin resistance is generally restored to the pre-pregnancy level but often the chronic β-cell dysfunction persists [2,3]. Women with a previous history of GDM are therefore at increased risk to develop T2DM [4]. Some women with GDM already develop glucose intolerance within the first year postpartum. Primary care has a crucial role in diagnosing GDM and even more in detecting progression to T2DM postpartum and counseling these women in lifestyle changes that can alter progression toward disease [5]. We review here the most important risk factors of women with GDM to develop glucose intolerance within one year postpartum and discuss the current recommendations for postpartum screening and the challenges for primary care to organize the follow up postpartum.

2. Screening for glucose intolerance postpartum

The American Diabetes Association (ADA) and the Endocrine Society recommendations advise screening for T2DM in all women who have had GDM at 6–12 weeks postpartum with a 2-h 75 g oral glucose tolerance test (OGTT) with non-pregnancy diagnostic criteria [1,6]. A HbA1c or fasting plasma glucose (FPG) is more commonly used screening tests for diabetes in the general population. These tests are easier to perform and cheaper than an OGTT. Moreover, a reasonable sensitivity for the diagnosis of T2DM has been shown when used in the general population. Studies evaluating the use of FPG alone or FPG in combination with HbA1c in women with a recent history of GDM show conflicting results with sensitivity rates of resp. 60–83% and 83–90% compared to the use of an OGTT [7–9]. The measurement of HbA1c alone does not seem to perform properly in this setting as shown by a low sensitivity of 22–65% compared to the use of an OGTT [8,10]. Beyond the first year postpartum, the ADA recommends that women with a history of GDM should have lifelong screening for the development of glucose intolerance, at least every 3 years [1]. Currently there is insufficient evidence to recommend one test over the other and therefore HbA1c, FPG, or 2-h 75 g OGTT can be used to test for diabetes.

The prevalence and risk factors of glucose intolerance postpartum also depend on the type of screening strategy and diagnostic criteria for GDM that was used. The initial criteria for diagnosis of GDM were established more than 40 years ago and were chosen to identify women at high risk for development of diabetes after pregnancy [11]. In the meantime, progressively more data emerged showing that the risk of adverse perinatal outcomes was also associated with milder degrees of hyperglycemia during pregnancy [12]. Following these data, The International Association of Diabetes and Pregnancy Study Groups' (IADPSG) recommends now the use of a one-step diagnostic approach with an OGTT with the use of more stringent diagnostic criteria for GDM [13]. These new recommendations lead to an important increase in the prevalence of GDM but a lower proportion of these newly defined GDM women will probably progress to T2DM postpartum. When the old criteria are used, the risk of women with GDM to develop T2DM within 10 years after the index pregnancy is generally high at around 30–50% [4]. The first follow up results with the IADSPG criteria for GDM suggest lower rates, with 28.4% of women with GDM developing glucose intolerance or diabetes 1–5 years after the index pregnancy [14].

The prevalence of obesity and T2DM is increasing worldwide and also in women of childbearing age, leading to more pregnant women with undiagnosed T2DM [15]. A large proportion of "early" T2DM after GDM probably represents undiagnosed T2DM that already existed prior to conception, but that was only detected at the time of GDM screening. The goal of early postpartum testing is therefore not only to detect T2DM that has rapidly progressed after GDM but also to detect T2DM that was already present before pregnancy. The timely diagnosis and treatment of pre-existing diabetes early in pregnancy is important as these women are at an increased risk for congenital anomalies due to their greater degree of hyperglycemia earlier in pregnancy. Many associations such as the ADA, the IADPSG and the World Health Organization recommend therefore now to screen for unknown diabetes at the first prenatal visit [1,13,16]. This should lead to a more timely diagnosis of T2DM before or during pregnancy and will reduce the number of women with a diagnosis of persistent T2DM in early postpartum.

3. Risk factors for developing glucose intolerance in early postpartum

To optimize the postpartum surveillance strategy it would be useful to identify clear risk factors for early progression to glucose intolerance after GDM, so that a more personalized (and presumably cheaper) surveillance strategy could be developed adapted to the individual risk. Frequently reported clinical risk factors are maternal age, ethnicity, parity, family history