ENDOCRINOLOGÍA Y NUTRICIÓN

EDITORIAL

Diagnostic criteria for gestational diabetes: The debate goes on ☆

Criterios diagnósticos de la diabetes gestacional: el debate continúa

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Gestational diabetes (GD) was first defined by J.B. O'Sullivan more than 50 years ago as any grade of hyperglycemia detected for the first time during pregnancy.[1] Diagnostic glucose values were measured in whole blood using the old Somogyi–Nelson method. Today we know that GD is a significant cardiovascular risk factor and that 15–50% of women with GD subsequently develop type 2 diabetes mellitus (DM).[2] This definition provided a consistent strategy for detection and classification, but is currently limited by a certain imprecision.

In 1979, the *National Diabetes Data Group* (NDDG) established cut-off points for risk based on the conversion to plasma of glucose levels in whole blood,[3] and in 1982 Carpenter and Coustan (CC) reviewed the cut-off points after eliminating the reducing substances that interfered with evaluation.[4] GD was simultaneously associated with increased perinatal risk, and the identification and treatment of women diagnosed were shown to reduce this risk.[5] In both cases (NDDG and CC), diagnosis consists of two steps, an initial screening with 50 g of glucose and confirmation with 100 g, and a difference of two points is required for a diagnosis of GD.

Controversy persisted until, following a conference of specialists in 1997,[6] the CC values were taken up by the American Diabetes Association (ADA) in 2000, and by the American College of Obstetrics and Gynecology (ACOG) in 2001. The new cut-off points resulted in an increased prevalence of GD, by 33% in Spain (from 8% to 11%) with no significant reduction in adverse perinatal results.[7]

However, different studies demonstrated that women who did not fully meet diagnostic criteria for GD because they were only one point above the threshold values had a course of pregnancy more similar to women with GD than to strictly normal women.[8–10] This brought the diagnostic criteria into question. The Hyperglycemia and Adverse Pregnancy Outcome (HAPO) study was therefore designed to clarify whether lower blood glucose levels in pregnancy increased the risk of adverse events related to GD.[11] A total sample of 25,000 women of different ethnic groups from more than 15 countries were studied after a single oral glucose tolerance test (OGTT) consisting of the administration of 75 g of glucose. The cut-off points associated with a C peptide value in cord blood higher than the 90th percentile and cesarean section and neonatal macrosomia and hypoglycemia rates were determined. A continuous increase was noted between the risk of adverse event occurrence and blood glucose levels, and a category of glucose levels at which a significant increase occurred in all primary events was decided upon. Diagnostic GD thresholds were 92 mg/dL under fasting conditions and 180 mg/dL and 153 mg/dL 1 and 2 h after OGTT respectively.

These results led to the proposal by the International Association of Diabetes and Pregnancy Study Groups of the so-called IADPSG criteria.[12] The first consequence of these criteria was an increase in the prevalence of GD,[13] which led to the controversy being reopened.

A second consequence was a new definition of GD as that diagnosed in the second or third trimester of pregnancy and with levels lower than those of frank diabetes. The current epidemic of obesity and diabetes is causing a high incidence of type 2 diabetes mellitus (T2DM) in women of childbearing age, with a resultant increase in the number of pregnant women with undiagnosed T2DM.

Detractors of the new criteria argue that this ''mild hyperglycemia'' may cause anxiety in women and increase the burden on the healthcare system with no clear improvement of adverse effects. This statement is based on a comparison of the course of women diagnosed with GD based on the various criteria used without assessing the reduction in morbidity associated with GD in those previously considered ''normal''.

Since then, many scientific societies have positioned themselves for and against the new criteria. The ADA adopted them in 2011,[14] although its position has been more ambiguous since 2014, leaving the option of diagnosis in one or two steps. The Irish, Belgian, Canadian, and French diabetes societies also support the criteria on the grounds that they identify more women at risk of maternal-fetal adverse events and represent an opportunity to decrease the morbidity associated with GD, although they recognize the resulting increase in GD prevalence in health care systems.[15–18]

Since 2003, our hospital has performed universal screening followed by immediate care, within a week, after a diagnosis of GD before week 28 of pregnancy in more than 98% of women. We adopted the IADPSG criteria in April 2011, although treatment criteria were not changed. We conducted a descriptive cost-effectiveness study comparing the results during the first year of use of the criteria to those achieved the year before, when CC criteria were used. The results of this study have recently been published.[19] The most significant strength of the study was that it was conducted in standard clinical practice and without the restrictions for physicians and patients involved in a randomized clinical trial, which may cause the results to be inapplicable in actual practice. Both cohorts were matched in age, pregestational BMI, parity, personal or family history of risk, and obstetric history. GD prevalence significantly increased (from 10% using the CC criteria to 35% with IADPSG criteria), but cesarean section rates and admissions to neonatal intensive care units decreased, and a significant reduction was seen in prematurity and fetal macrosomia. No increase was seen in the number of low-weight newborns. An economic study was performed including the costs of material (packages of 50, 75, and 100 g of glucose, insulin, strips, etc.), visits to physicians and diabetes nurses, and the hospital costs of complications (cesarean sections, intensive care stays). Savings of €14,000 per 100 women were estimated. This represents estimated annual savings of over €250,000 in our catchment area alone. Extrapolation of our results to the Madrid Autonomous Community suggests that more than three million euros could be saved every year.

These results answered some of the questions posed:

1. The use of the IADPSG criteria resulted in a clear improvement in the maternal and fetal adverse effects of GD as compared to the CC criteria.
2. A higher number of patients with GD, who were previously considered normal according to the CC criteria, were identified.
3. The adoption of IADPSG criteria was not associated with a risk of overtreatment or greater insulinization rates. Eighty percent of women were controlled with dietary treatment, and only 20% required insulin. The result was that the proportion of low-weight newborns not only did increase, but also decreased to 6.5%.
4. The implementation of IADPSG criteria contributed to decreased costs. Despite the significant increase in prevalence, costs decreased because complications were reduced. This compensated for the initial costs of strips, insulin, and visits, and combined with the significant benefits for the mother and the newborn, leads us to believe that our adoption of the new criteria has been cost/effective.

A retrospective study analyzing perinatal complications in patients with GD has recently been reported.[20] In this study, patients were divided into three groups: GD based on CC criteria; normal women based on CC criteria, and normal women based on both criteria. This study again showed that women not treated and considered normal by CC criteria and diagnosed with GD based on IADPSG criteria had neonatal results similar to those of women previously diagnosed with GD using CC criteria. Each of these results was significantly greater as compared to those of the control group with normal tolerance using both criteria. This suggests that women who would previously be normal using CC criteria to whom a diagnosis of GD based on IADPSG criteria has been added differ from the normal population.

To sum up, the new criteria represent a significant increase in prevalence, which may and should be effectively managed with lifestyle measures. There can no longer be any excuse for not adopting them, as they have clear benefits for the health of women and newborns and decrease costs by decreasing complications.

In this regard, the ADA, in its 2015 treatment standards,[21] while maintaining the option of both criteria, states that on the basis of the new evidence it recommends the use of the IADPSG criteria as the approach of choice because they represent an opportunity to decrease maternal-fetal morbidity.[19,20]

In our view, this should close the debate, and endocrinology units should be able to enlist nurses specialized in diabetes to perform a good part of the clinical care of these women with GD, a highly prevalent condition with significant short and long-term adverse effects, at a time when early detection and treatment are essential.

Conflicts of interest

The authors state that they have no conflicts of interest.

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