

Gestational Diabetes Mellitus: Implications of an Increased Frequency With IADPSG Criteria

My sermon on the meaning of the manna in the wilderness can be adapted to almost any occasion, joyful, or, as in the present case, distressing. I have preached it at harvest celebrations, christenings, confirmations, on days of humiliation and festal days.

Dr. Chasuble from *The Importance of Being Earnest*. Oscar Wilde, 1895

And so, to a greater or lesser extent, gestational diabetes mellitus (GDM) continues to provide something for everyone. The implications of recent publications can be interpreted, argued, and adapted in many ways.

The observational Hyperglycemia and Adverse Pregnancy Outcome (HAPO) study (1) and the consensus agreement about new diagnostic criteria by the International Association of the Diabetes and Pregnancy Study Groups (IADPSG) (2) have made a significant step toward international consensus but in some respects have opened a Pandora's box (3).

In a recent publication, Ryan (4) calculated that the number of adverse perinatal events that could be hypothetically preventable with the new criteria would be relatively small and implied that a cost-benefit analysis may not be supportive. He also cogently argued that a raised maternal BMI could in most cases be the major predictive factor for large-for-gestational-age babies and that our approach has become too glucocentric. Using an OR of 2.0 rather than 1.75 for the diagnostic criteria would diagnose the same approximate number of women with gestational diabetes mellitus (GDM) as are now found with, in his opinion, a small but acceptable increase in complications. In a later edition of the same journal Long (5) argued strongly against the use of consensus standards and wrote, "Medical experts should discipline themselves to limit their recommendations to high-level RCT evidence." It is now de rigueur for every obstetric- or diabetes-related journal to have a "for and against" section related to the proposed IADPSG criteria.

In this edition of *Diabetes Care* there is another report from the HAPO group (6) that is likely to further increase the debate, perhaps with an even more international flavor. The IADPSG criteria were applied

in a post hoc analysis to the data obtained from the centers participating in the HAPO study. Although the overall frequency of GDM was 17.8%, this varied between 9.3 and 25.5% at different centers. Prospective data about the potential frequency of GDM with the new criteria from different parts of the world has been relatively slow. One study from Australia (7) found an increase with the IADPSG criteria from 9.6 to 13.0%, a final figure not dissimilar to the 12.4 and 15.3% from the two HAPO sites in Australia. Clearly the frequency of GDM will increase significantly with the new criteria, and this may be further exaggerated in areas where there are a higher proportion of women with acknowledged risk factors for GDM.

However, what this report (6) reveals is that the proportion of women being diagnosed with GDM on the basis of either the fasting or one of the two post-glucose load results will vary widely. For the complete HAPO cohort, the IADPSG criteria diagnosed 55% on the fasting glucose alone. For HAPO centers in Bangkok and Hong Kong it was only 24 and 26%, respectively. However, before any generalizations can be made about Asian vis-a-vis Caucasians (for example), it is interesting to note that in Singapore, 47% were diagnosed on the fasting result. These data have important implications. On the basis of the initial IADPSG recommendations, consideration has been given to a simplification of the testing procedure, with for example, the use of only the fasting or the fasting and the 1-h sample. Clearly, if there is to be international applicability of the IADPSG criteria, then this particular modification will not be possible. Any local adaptations will need to rely on accurate local data of the population under consideration.

There is a continuum of risk for adverse pregnancy outcomes related to increasing maternal glucose levels. This risk even applies to glucose levels well below the diagnostic points of GDM (8). Although some, but not all, of this risk could be alternatively defined on the basis of increasing

maternal BMI, attempts to reduce maternal BMI prepregnancy or influence weight gain during pregnancy have rarely been successful or sustainable. From a clinical perspective, at least an elevated glucose detected during pregnancy can be reduced with improvements in fetal outcomes. Herein lies one of the strengths of a glucocentric approach.

Other strengths of the IADPSG criteria include a reduction in the patient burden by using a test of only 2-h duration and dispensing with a preliminary glucose challenge test—a test chosen more for its convenience in a crowded clinic rather than for its relation to patient care. Internationally, clinicians are happy with the prospect of a single diagnostic test and criteria. However, the more problems we solve, the more questions can be raised.

Given that there is a continuum of risk, no criteria will ever be comprehensive. Given that the criteria are based on a consensus, there will always be an opportunity for divergent opinions. Given that the funds for obstetric care are undoubtedly finite, is a glucocentric approach an effective use of resources? Will the categorization of women as having an abnormality in pregnancy ultimately lead to its own problems? To what extent, even at this late stage, have the consumers been involved in the decision making? What will happen if diabetologists take one path and obstetric care providers another?

Also in this edition of the journal is the first cost-effectiveness analysis (9). These studies, of necessity, are based on assumptions, and in this particular article the rate of GDM by current criteria appears very low. With this particular precaution, the conclusion that testing for GDM using the IADPSG criteria is only cost-effective if postpartum interventions to prevent type 2 diabetes can be implemented is challenging as it opens the door for another range of cost-effectiveness studies. What also could not be included in the model, as acknowledged by the authors, is the effect of the treatment of women identified with GDM on intrauterine programming and epigenetic changes. This may ultimately be

