

Towards a European Consensus on Gestational Diabetes Mellitus: A Pragmatic Guide for Diagnosis, Management, and Care

The Polish Diabetes in Pregnancy Study Group and FIGO

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In view of the rising global burden of diabetes and obesity the International Federation of Gynecology and Obstetrics (FIGO) embarked on a new initiative in 2014 to raise awareness about the link between hyperglycemia in pregnancy (HIP) and poor maternal and fetal outcomes, and the risk to the future health of both the mothers with HIP and their offsprings. To achieve this FIGO brought together a group of experts to frame the issues and develop a document suggesting key actions to address the public health burden posed by HIP. The FIGO “Initiative on gestational diabetes mellitus: A pragmatic guide for diagnosis, management, and care” was launched at FIGO World Congress in October 2015 in Vancouver and published as a special supplement of the International Journal of Gynecology and Obstetrics [1]. The document provides pragmatic guidance for testing, management and care of women with GDM regardless of resource settings and calls for a clearly defined global health agenda to tackle the issue.

Despite challenges of providing guidance in the setting of limited high-quality evidence, particularly from the developing world, the document outlines up to date global standards for testing, management, and care of women with GDM and provides pragmatic recommendations: which due to their feasibility, acceptability, and ease of implementation, have the potential to produce significant impact. Suggestions are provided for a variety of different regional financial, human, and infrastructure resource settings. The document also outlines research priorities to bridge the current knowledge and evidence gap.

Prior to publication, the document was widely circulated for evaluation and received support from many interna-

tional groups such as the European Board and College of Obstetrics and Gynaecology (EBCOG), The Society of Obstetricians and Gynecologists of Canada (SOGC), Chinese Society of Perinatal Medicine, Diabetic Pregnancy Study Group (DPSG), African Federation of Obstetrics and Gynaecology (AFOG), South Asian Federation of Obstetrics and Gynecology (SAFOG), Australian Diabetes in Pregnancy Society (ADIPS), International Association of Diabetes in Pregnancy Study Groups (IADPSG), European Association of Perinatal Medicine (EAPM), International Diabetes Foundation (IDF), Diabetes in Pregnancy Study Group of India (DIPSI), and the Diabetes in Pregnancy Study Group of Latin America, in addition to the executive board and other relevant committees and working groups within FIGO.

While the document has been welcomed and well received globally, implementing the recommendations on the ground in the diverse global settings requires advocacy and awareness raising, building capacity and addressing the knowledge gaps including operational research and generating health economics evidence. This is the challenge that FIGO plans to address in the next phase.

A summary of the main areas of focus are provided below though we strongly suggest reading the original document which is open access and can be found here: www.figo.org/figo-project-publications. Hereby, we list the exact quotes on the matter from the paper: The International Federation of Gynecology and Obstetrics (FIGO) Initiative on Gestational Diabetes Mellitus: A Pragmatic Guide for Diagnosis, Management, and Care published in International Journal of Gynecology and Obstetrics 131 S3 (2015) S173–S211:

GESTATIONAL DIABETES MELLITUS

The occurrence of GDM parallels the prevalence of impaired glucose tolerance (IGT), obesity, and type 2 diabetes mellitus (T2DM) in a given population. These conditions are on the rise globally. Moreover, the age of onset of diabetes and pre-diabetes is declining while the age of childbearing is increasing. There is also an increase in the rate of overweight and obese women of reproductive age; thus, more women entering pregnancy have risk factors that make them vulnerable to hyperglycemia during pregnancy [1].

It should therefore not be surprising that hyperglycemia is one of the most common medical conditions during pregnancy; an estimated one in seven live births globally (16.8%) are to women with some form of hyperglycemia in pregnancy. While 16% of these cases may be due to diabetes in pregnancy (either pre-existing diabetes — type 1 or type 2 — which antedates pregnancy or is first identified during testing in the index pregnancy), the majority (84%) are due to gestational diabetes mellitus (GDM) [1, 2].

GDM is associated with higher incidence of maternal morbidity including cesarean deliveries, shoulder dystocia, birth trauma, hypertensive disorders of pregnancy (including pre-eclampsia), and subsequent development of T2DM. Perinatal and neonatal morbidities also increase; the latter include macrosomia, birth injury, hypoglycemia, polycythemia, and hyperbilirubinemia. Long-term sequelae in offspring with in utero exposure to maternal hyperglycemia may include higher risks for obesity and diabetes later in life [1].

Given the interaction between hyperglycemia and poor pregnancy outcomes, the role of in utero imprinting in increasing the risk of diabetes and cardio-metabolic disorders in the offspring of mothers with hyperglycemia in pregnancy, as well as increasing maternal vulnerability to future diabetes and cardiovascular disorders, there needs to be a greater global focus on preventing, screening, diagnosing, and managing hyperglycemia in pregnancy. The relevance of GDM as a priority for maternal health and its impact on the future burden of non-communicable diseases is no longer in doubt; but how best to deal with the issue remains contentious as there are many gaps in knowledge on how to prevent, diagnose, and manage GDM to optimize care and outcomes. These must be addressed through future research [1].

Global healthcare organizations and professional bodies have advocated a plethora of diverse algorithms for screening and diagnosis of GDM which have been criticized for lacking validation, such as they were developed based on tenuous data, the result of expert opinions, biased owing to economic considerations, or convenience-oriented, thereby creating confusion and uncertainty among care providers [3]. One underlying yet fundamental problem, as shown consistently by several studies including the Hyperglycemia and Adverse Pregnancy Outcomes (HAPO) study [4], is that the risk of poor pregnancy

outcomes associated with hyperglycemia is continuous with no clear inflection points. It is therefore clear that any set of criteria for the diagnosis of GDM proposed will need to evolve from a consensus approach, balancing risks and benefits in particular social, economic, and clinical contexts. As well as different cut-off values, the lack of consensus among the different professional bodies for an algorithm for screening and diagnosis of GDM is perhaps an even larger problem [1].

In most parts of low and middle income countries (LMICs) (which contribute to over 85% of the annual global deliveries), the majority of women are not screened for diabetes during pregnancy — despite the fact that these countries account for 80% of the global diabetes burden as well as 90% of all cases of maternal and perinatal deaths and poor pregnancy outcomes [1]. In particular, 8 LMICs — India, China, Nigeria, Pakistan, Indonesia, Bangladesh, Brazil, and Mexico account for 55% of the global live births (70 million live births annually) as well as 55% of the global burden of diabetes (209.5 million) and should be key targets for any focused strategy on addressing the global burden of GDM pregnancies [1]. These countries have been identified as priority countries for all future FIGO GDM interventions.

Leave alone the developing world, even in countries within Europe, with their well-developed public health systems and universal health coverage; there is lack of consensus on the optimal approach to testing for HIP, particularly, the utility of the continued use of risk-based testing versus universal testing. Despite the evidence that risk based testing fails to identify almost half the cases, concerns continue to be expressed that universal testing and (consequently) increased diagnosis of GDM would place additional logistical and economic challenges to healthcare systems, as oral glucose tolerance tests (OGTT) are time-consuming and incur costs. On the other hand, the problem of complex protocols for testing based on risk factors, which places high demands on healthcare providers, with the consequent lower compliance and missed diagnosis has not been acknowledged. These arguments also do not take into account the immediate and long term health and economic benefits of testing, diagnosis and management of HIP and providing post-partum preventive care to the high risk mother child pair and therefore screening based on risks and/or a GCT cannot be endorsed for either health or economic reasons [5].

Given the high rates of hyperglycemia in pregnancy in most populations and that selective testing based on known risk factors has poor sensitivity for detection of GDM, it seems appropriate to recommend universal rather than risk factor-based testing. This approach is strongly recommended by FIGO [1]. In addition to universal testing, FIGO endorses the single step approach to diagnosis and testing as recommended by the World Health Organiza-

tion (WHO) and International Association of Diabetes in Pregnancy Study Groups (IADPSG).

In summary of the paper The International Federation of Gynecology and Obstetrics (FIGO) Initiative on Gestational Diabetes Mellitus: A Pragmatic Guide for Diagnosis, Management, and Care published in International Journal of Gynecology and Obstetrics 131 S3 (2015) S173–S211, to address the issue of GDM, FIGO recommends the following:

Public health focus: *There should be greater international attention paid to GDM and to the links between maternal health and non-communicable diseases on the sustainable developmental goals agenda. Public health measures to increase awareness, access, affordability, and acceptance of preconception counselling, and prenatal and postnatal services for women of reproductive age must be prioritized [1].*

Universal testing: *All pregnant women should be tested for hyperglycemia during pregnancy using a one-step procedure and FIGO encourages all countries and its member associations to adapt and promote strategies to ensure this [1].*

Criteria for diagnosis: *The WHO criteria for diagnosis of diabetes mellitus in pregnancy and the WHO and the International Association of Diabetes in Pregnancy Study Groups (IADPSG) criteria for diagnosis of GDM should be used when possible. Keeping in mind the resource constraints in many low-resource countries, alternate strategies described in the document should also be considered equally acceptable [1].*

Diagnosis of GDM: *Diagnosis should ideally be based on laboratory results of venous plasma samples that are properly collected, transported, and tested. Given the resource constraints in many low-resource countries, it is acceptable to use a plasma-calibrated handheld glucometer for diagnostic purposes [1].*

Management of GDM: *Management should be in accordance with available national resources and infrastructure even if the specific diagnostic and treatment protocols are not supported by high-quality evidence, as this is preferable to no care at all [1].*

Lifestyle management: *Nutrition counselling and physical activity should be the primary tools in the management of GDM. Women with GDM must receive practical nutritional education and counselling that will empower them to choose the right quantity and quality of food and level of physical activity. They should be advised repeatedly during pregnancy to continue the same healthy lifestyle after delivery to reduce the risk of future obesity, T2DM, and cardiovascular diseases [1].*

Pharmacological management: *If lifestyle modification alone fails to achieve glucose control, metformin, glyburide, or insulin should be considered as safe and effective treatment options for GDM during the second and third trimesters [1].*

Postpartum follow-up and linkage to care: *Following a GDM pregnancy, the postpartum period provides an important platform to initiate beneficial health practices for both*

mother and child to reduce the future burden of several non-communicable diseases. Obstetricians must establish links with family physicians, internists, pediatricians, and other healthcare providers to support postpartum follow-up of GDM mothers and their children. A follow-up program linked to the child's vaccination and regular health check-up visits provides an opportunity for continued engagement with the high risk mother-child pair [1].

Future research: *There should be greater international research collaboration to address the knowledge gaps to better understand the links between maternal health and non-communicable diseases. Evidence-based findings are urgently needed to provide best practice standards for testing, management, and care of women with GDM. Cost-effectiveness models must be used for countries to make the best choices for testing and management of GDM given their specific burden of disease and resources [1].*

THE SITUATION IN EUROPE AND NEED FOR EUROPEAN CONSENSUS

Infant and maternal mortality in Europe is generally quite low and continues to decline, but perinatal mortality and morbidity remains a major concern [6]. The incidence of pre-term and very pre-term births, fetal growth restriction, and congenital anomalies has increased in many countries, reflecting limited achievements in preventing high risk situations. About one-third of all fetal deaths and 40% of all neonatal deaths in Europe were among babies born before 28 weeks of gestation [6]. Stillbirths have also declined less rapidly, and in many cases their causes remain unknown. Increased clinical and community awareness of the risks associated with common pre-gestational and gestational medical disorders (e.g. diabetes and hypertension) and implementation of best practice guidelines might improve management and lower associated stillbirth rates [7].

With the introduction of targeted interventions, there are declining rates of direct maternal deaths within Europe. Most maternal deaths in Europe, as elsewhere in the world, are directly due to hemorrhage, hypertension, thromboembolic disease, sepsis and obstructed labor, the risk for which is considerably increased with HIP. Addressing obesity and HIP may help further lower maternal and newborn morbidity and mortality by lowering the risk of pregnancy complications such as pre-term births, still births, congenital anomalies, small and large babies which are critical problems for maternal and child health in Europe [6].

Without preventive care, almost half of women with gestational diabetes go on to develop type 2 diabetes and a significant proportion develops premature cardiovascular disease within 10 years of childbirth [8–10]. Children born to women with HIP are also at very high risk of obesity, early onset type 2 diabetes and cardiovascular disease whereby,

HIP perpetuates these conditions into the next generation [11–13].

Focusing on maternal obesity and HIP screening during pregnancy provides a unique opportunity to integrate services which would lower traditional maternal and perinatal morbidity and mortality indicators and address inter-generational prevention of NCDs such as obesity, diabetes, hypertension and CVD. But how can we achieve this when we bury our heads in the sand and continue to disregard the basic premise of testing all pregnant women for hyperglycemia as alluded to earlier? It is unbelievable, that health care funding has not been prioritized for this and for targeted, preventive post-partum care and health promotion for high-risk mother and child pairs.

The European Association of Perinatal Medicine (EAPM), the European Board and College of Obstetrics and Gynecology (EBCOG) and the International Association of Diabetes in Pregnancy Study Groups (IADPSG) were amongst the first to endorse and support the FIGO document.

It is about time that health planners and policy makers in Europe pay heed to these recommendations and take appropriate steps to implement the necessary actions to address the link between maternal health, obesity and diabetes as a public health priority and accelerate the implementation of the FIGO GDM initiative in Europe, through supportive policy actions and mobilizing resources for its implementation, including:

- Encouraging all countries in Europe to adapt and promote **Universal testing of all pregnant women** for hyperglycemia using **a one-step procedure as a minimum standard**.
- Supporting efforts to increase public awareness about hyperglycemia in pregnancy and its impact on maternal and child health; encourage preconception counseling, antenatal care and post-natal follow up.
- Encouraging task shifting and role based training to build capacity for prevention, early diagnosis, and treatment of HIP and continued engagement with the high risk mother child pair over a prolonged time period linked to the child's vaccination program and collaboration between medical specialties.
- Improving access to uninterrupted diagnostic supplies, medications and trained manpower for diagnosis and appropriate management for HIP at all levels of care at affordable costs keeping the pregnant women's convenience in mind.

- Supporting and funding of research that fuels both the discovery of new tools and procedures to improve point of care diagnostics, monitoring and management of HIP and the ability to engage, counsel and track the mother-child pair over the long term; as well as carry out operational research to improve collaboration and efficacy in existing programs, keeping in mind the health care delivery realities in different parts of Europe.

Failure to act now will only prove the adage "penny wise and pound foolish".

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