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IDF Diabetes Atlas

Global estimates of the prevalence of hyperglycaemia in pregnancy

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ABSTRACT

Aims: We estimated the number of live births worldwide and by IDF Region who developed hyperglycaemia in pregnancy in 2013, including total diabetes in pregnancy (known and previously undiagnosed diabetes) and gestational diabetes.

Methods: Studies reporting prevalence of hyperglycaemia first-detected in pregnancy (formerly termed gestational diabetes) were identified using PubMed and through a review of cited literature. A simple scoring system was developed to characterise studies on diagnostic criteria, year study was conducted, study design, and representation. The highest scoring studies by country with sufficient detail on methodology for characterisation and reporting at least three age-groups were selected for inclusion. Forty-seven studies from 34 countries were used to calculate age-specific prevalence of hyperglycaemia first-detected in pregnancy in women 20–49 years. Adjustments were then made to account for heterogeneity in screening method and blood glucose diagnostic threshold in studies and also to align with recently published diagnostic criteria as defined by the WHO for hyperglycaemia first detected in pregnancy. Prevalence rates were applied to fertility and population estimates to determine regional and global prevalence of hyperglycaemia in pregnancy for 2013. An estimate of the proportion of cases of hyperglycaemia in pregnancy due to total diabetes in pregnancy was calculated using age- and sex-specific estimates of diabetes from the IDF Diabetes Atlas and applied to age-specific fertility rates.

Results: The global prevalence of hyperglycaemia in pregnancy in women (20–49 years) is 16.9%, or 21.4 million live births in 2013. An estimated 16.0% of those cases may be due to total diabetes in pregnancy. The highest prevalence was found in the South-East Asia Region at 25.0% compared with 10.4% in the North America and Caribbean Region. More than 90% of cases of hyperglycaemia in pregnancy are estimated to occur in low- and middle-income countries.

Conclusion: These are the first global estimates of hyperglycaemia in pregnancy and conform to the new WHO recommendations regarding diagnosis and also include estimates of live births in women with known diabetes. They indicate the importance of the disease from a public health and maternal and child health perspective, particularly in developing countries.

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1. Introduction

Until recently, any hyperglycaemia first detected during pregnancy was termed gestational diabetes [1]. However, this definition did not differentiate between different severity of hyperglycaemia. The World Health Organization recently proposed new criteria for the diagnosis and definition of hyperglycaemia first detected in pregnancy which distinguishes the more serious diabetes in pregnancy (DIP), which is more likely to persist beyond the birth, from gestational diabetes (GDM), a milder degree of hyperglycaemia [2]. The new definition calls for an understanding of the burden of hyperglycaemia in pregnancy and its relationship with the growing epidemic of type 2 diabetes and distinguishes DIP from GDM based on the degree of hyperglycaemia; a reflection that the risk of serious complications is much higher in diabetes than in the milder GDM. Where studies previously reported the prevalence of GDM, under the new definition, these figures would also include the more severe hyperglycaemia classified as diabetes in pregnancy (DIP) under the broad title of hyperglycaemia first-detected in pregnancy (HFDP). Adding to this definition pregnancy in women with known diabetes, we use the term hyperglycaemia in pregnancy (HIP) to describe the burden of any glucose intolerance in pregnancy. In previous studies, any level of glucose intolerance in pregnancy was termed GDM. A description of the terminology used in this paper and its relation to the estimates proposed is presented in Fig. 1.

HIP, including gestational diabetes mellitus (GDM) and total diabetes in pregnancy (TDP) (comprising both known diabetes in pregnant women, and previously undiagnosed diabetes in pregnancy (DIP)), is a common metabolic disorder during pregnancy and has been associated with serious perinatal complications for both mother and child. In the short-term, infants born to mothers with HFDP are at increased risk of foetal macrosomia (also known as large-for-gestational-age), hypoglycaemia and hyperinsulinemia at birth, and risks of shoulder dystocia associated with obstructed labour [3,4]. Mothers with the condition are at increased risk of pre-eclampsia, gestational hypertension, caesarean section, and hydramnios [3,4]. Moreover, TDP adds to these complications an increased risk of foetal malformations, foetal loss, perinatal and neonatal mortality, as well as an increased risk of maternal mortality [5,6]. The growing numbers of younger adults with type 2 diabetes mellitus (T2DM) [7] may be contributing to rising trends in HIP.

Studies describing the risk factors and risk markers of gestational diabetes used the previous definition of the disease and there is some overlap with risk factors for T2DM. The presence of previously undiagnosed T2DM may play a role in the similarities. These risk factors and risk markers include: advancing age; obesity; excessive weight gain during pregnancy; a family history of diabetes; gestational diabetes during a previous pregnancy; a history of stillbirth or infant with congenital abnormality; and glycosuria during pregnancy [8,9]. Similarly, certain ethnic groups found to have a higher prevalence of GDM have also been found to have a higher prevalence of T2DM [10,11,12]. GDM poses a long-term risk of developing T2DM for both mother [10] and possibly for the child as well [13] and may be contributing to the increasing global epidemic of T2DM. Despite this, a substantial proportion of women who develop GDM do not have a high-risk profile and some women who may be considered high-risk never develop the condition [14,15].

Despite the serious public health implications of HIP, there has been is no universal definition and no universal standards for screening and a wide variety of methods are applied.

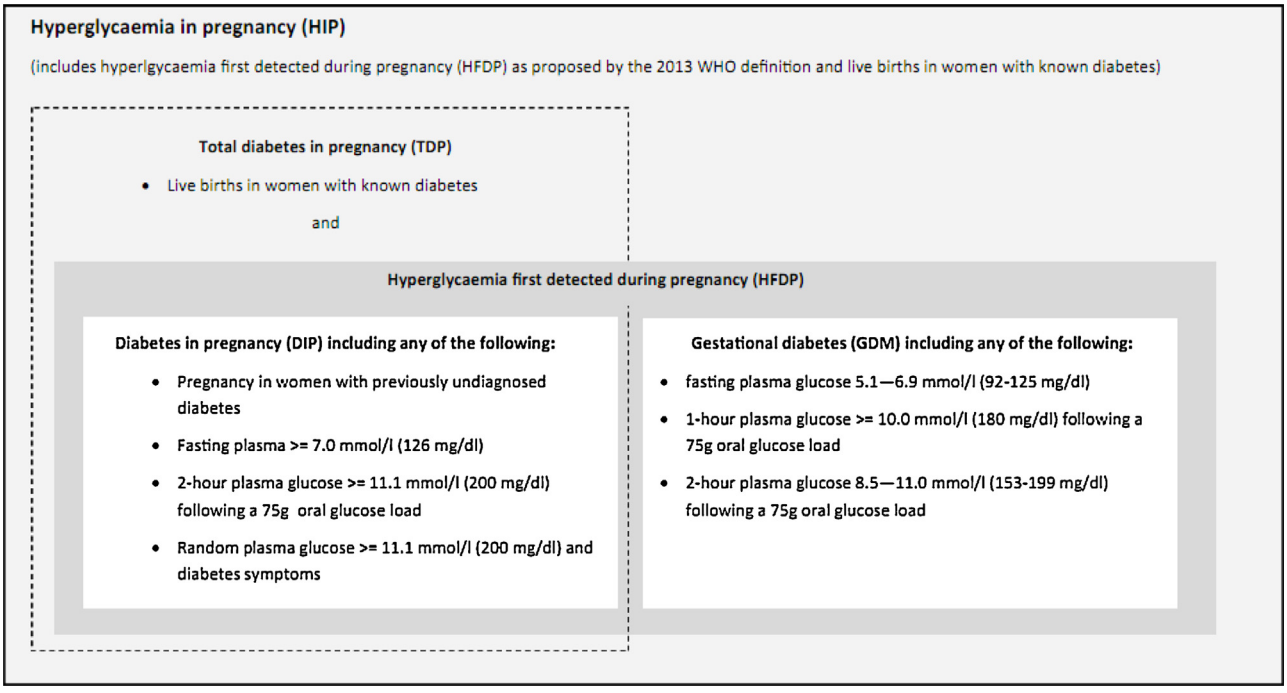

Fig. 1 – Terminology and classification for prevalence estimates of hyperglycaemia in pregnancy for 2013.