



Diabetes in pregnancy—a critical window of opportunity

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Gestational diabetes mellitus (GDM) is a public health priority in our country due to its high prevalence as well as its immense potential for diabetes prevention. The realization that diabetes in pregnancy is a significant contributor to the growing epidemic of type 2 diabetes mellitus (T2DM) has also helped focus our attention on the pregnant woman as a critical target for diabetes prevention strategies.

Diabetes in pregnancy has serious consequences for the mother as well as the baby. The HAPO study found increasing incidence of these complications with rising maternal glucose [1]. In the mother, complications include still birth and a greater need for cesarean section and in the babies, it can cause large babies and congenital malformations. These can affect outcome of pregnancy and it is essential that diabetes is detected early and managed appropriately so that these consequences can be prevented.

The clinical issues that follow GDM in pregnancy are well appreciated. However, the transformation of GDM as a major public health issue is because it may play a crucial role in the increasing prevalence of diabetes and obesity [2]. In fact, GDM is believed to be a stage in the evolution of type 2 DM [3].

Hyperglycemia in pregnancy has its highest prevalence in South-East Asia, where one in four pregnancies is affected. Asians develop GDM at a lower BMI and type 2 DM occurs at a much younger age. With urbanization, GDM prevalence is becoming an epidemic [4]. In India, the prevalence of GDM varies from 3.8 to 21% in different parts of the country [5]. Approximately 7% of all pregnancies are complicated by GDM, resulting in more than 200,000 cases annually [6]. Indian women have 11-fold increased risk of developing glucose intolerance during pregnancy compared to Caucasian women [7].

GDM is also a known risk factor for T2DM [8] besides its known adverse impact on pregnancy outcome. Women with GDM have a seven fold higher risk of developing T2DM. This risk increases steeply 5 years after delivery [9, 10]. Women with a history of GDM also have a higher prevalence of metabolic syndrome and increased risk of cardiovascular disease (CVD) [11].

Children of GDM mothers are at a higher risk of developing T2DM later in life [21 vs 4%] compared with children of non GDM mothers [12]. Babies born to mothers with gestational diabetes also have a higher lifetime risk of obesity and developing type 2 diabetes. GDM may be responsible for 19–30% of diabetes in some populations [13]. About one third of children born of diabetes pregnancies develop glucose intolerance before the age of 17 years [14].

Direct evidence of the benefits of interventions in the prevention of future of T2DM in the context of GDM also exists. Postpartum lifestyle intervention prevents type 2 DM and cardiovascular disease in women with GDM. Intensive lifestyle and metformin are highly effective in delaying or preventing diabetes in women with IGT and a history of GDM [15, 16]. More importantly, the pregnant mother with diabetes is a very effective starting point for a diabetes prevention strategy as she is highly motivated and carries the message to the family effectively.

The pregnant diabetic mother provides a critical link for transgenerational transmission of diabetes which sets off a self-perpetuating cycle of rising diabetes in the community. The hyperglycemia associated with GDM results in fetal overnutrition and a higher risk of obesity and diabetes in the offspring through a variety of mechanisms. These include epigenetic changes in the exposed offspring [17]. When postnatal overnutrition gets added to this scenario, there is higher childhood and adolescent obesity and early onset adult type 2 diabetes. This in turn increases the prevalence of GDM and sets off a vicious cycle of GDM and T2DM in the community [18]. Epigenetic changes in various genes may increase the lifelong metabolic disease susceptibility and, thus, the likelihood for a new generation of mothers with GDM and/or obesity thus feeding the vicious cycle [17]. Preventive measures against

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type 2 DM should start during intra uterine period and continue throughout life from early childhood [19].

Asian Indians are a high-risk ethnic group for development of diabetes. Hence, all pregnant Indian women need to be screened for GDM. There is an urgent need to screen all mothers for diabetes early enough to detect and initiate appropriate treatment to prevent and minimize its effects not only on mother and the fetus but also to prevent the transgenerational propagation of diabetes and contain the diabetic epidemic in the community.

There are two articles in this issue which focus on early detection and optimizing treatment in GDM. While the study by Melekoglu et al. [20] evaluates specific screening strategies to enhance greater detection of GDM in the first trimester, the studies by Xia et al. [21] have evaluated the effects of lifestyle in the control of glycemia in GDM. Using the criteria of the International Association of Diabetes and Pregnancy Study Groups (IADPSG), Melekoglu et al. [20] showed that 80% of GDM cases could be detected in the first trimester itself, thus offering the scope for early intervention. The meta-analysis by Xia et al. clearly confirms the beneficial effect of lifestyle interventions in controlling both fasting and postprandial hyperglycemia in GDM.

From the above, it is clear as to why the pregnant woman has emerged as an important target group for diabetes prevention. GDM offers an important opportunity for the development and implementation of various strategies for diabetes prevention [22]. Screening and identifying women with diabetes or GDM provides us an opportunity to make significant contributions which have great public health relevance. The high risk of gestational diabetes mellitus in pregnant women of our country and its early detection and effective treatment can prevent all adverse outcomes of pregnancy and result in a normal, healthy mother and baby after delivery. Diabetes in pregnancy is associated with a higher risk for future development of diabetes both for the mother and for the babies. Diagnosis of GDM helps us identify women at very high risk of future diabetes and CVD and by offering preventive care provides us the opportunity to prevent or delay diabetes and CVD and their complications. It also helps identify individuals—offsprings of GDM pregnancy, who are at considerable high risk of diabetes and other noncommunicable diseases (NCDs) and offer them early preventive care to contain the rising burden of T2DM and other NCDs.

Pregnancy offers a huge window of opportunity to not only improve pregnancy outcomes in GDM but also to address intergenerational prevention of NCDs, such as diabetes and cardiovascular disease.

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