

Alteration of Placental Development and Vascular Dysfunction in Gestational Diabetes Mellitus Has Impact on Maternal and Infant Health

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Abstract : The aim of this study is to investigate changes in placental development and vascular dysfunction which subsequently affect fetomaternal health in pregnancies complicated by gestational diabetes mellitus (GDM). Fetal and postnatal adverse health outcomes of GDM are shown to be associated with disturbances in placental structure and function. Children of women with GDM are more likely to be obese and diabetic in childhood and adulthood. GDM also increases the risk of adverse pregnancy outcomes, including preeclampsia, birth injuries, macrosomia and neonatal hypoglycemia, respiratory distress syndrome, neonatal cardiac dysfunction and stillbirth. Incidences of type 2 diabetes in the MENA region are growing at an alarming rate which is estimated to become more than double by 2030. Five of the top 10 countries for diabetes prevalence in 2010 were in the Gulf region. GDM also increases the risk of development of type 2 diabetes. Interestingly, more than half of the women with GDM develop diabetes later in their life. The human placenta is a temporary organ located at the interface between mother and fetal blood circulation. Placenta has a central role as both a producer as well as a target of several molecules that are involved in placental development and function. We have investigated performed a Pubmed search with key words placenta, GDM, placental villi, vascularization, cytokines, growth factors, inflammation, hypoxia, oxidative stress and pathophysiology. We have investigated differences in the development and vascularization of placenta, their underlying causes and impact on fetomaternal health through literature review. We have also identified gaps in the literature and research questions that need to be answered to completely understand the central role of placenta in the GDM. This study is important in understanding the pathophysiology of placenta due to changes in the vascularization of villi, surface area and diameter of villous capillaries in pregnancies complicated by GDM. It is necessary to understand these mechanisms in order to develop treatments to reverse their effects on placental malfunctioning, which in turn, will result in improved mother and child health.

Keywords : gestational diabetes mellitus, placenta, vasculature, villi

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