

# Fetal sex and risk of developing gestational diabetes mellitus and type 2 diabetes mellitus in mother

## Opinion

Fetal sex can define the risk of developing Gestational Diabetes Mellitus and subsequent risk of developing Type 2 Diabetes Mellitus in women following delivery. There are studies suggesting that fetal sex may have implications on obstetrical outcomes at the time of delivery. Male fetus are at a greater risk of developing adverse perinatal outcomes in the form of premature rupture of membranes, umbilical cord prolapse, true umbilical cord knot, caesarian section and lower APGAR score.<sup>1</sup> It was never suspected that carrying a male fetus could possibly predict the maternal risk of developing Gestational Diabetes Mellitus in the ongoing pregnancy and development of type 2 diabetes mellitus later in life. Male gender of the fetus is considered to be an independent risk factor for adverse pregnancy outcome.<sup>1</sup> Interestingly few recent studies suggest that carrying a male fetus may lead to poor pancreatic beta-cell function in women leading to hyperglycemia and thereby increasing risk of developing Type 2 Diabetes Mellitus.

Retnakaran et al studied all women with singleton, live birth first pregnancies between April 2000 to March 2010. A total of 642987 pregnant women were recruited.<sup>2</sup> Out of these 313280 delivered a girl child and the remaining delivered a male child. This cohort was followed up for a median period of 3.8 years. Development of type 2 diabetes was the main outcome and it was found that carrying a male fetus yielded a greater risk of gestational diabetes in the ongoing pregnancy and also the second pregnancy. The same authors in a subsequent study concluded that after adjusting for classical risk factors of developing gestational diabetes like maternal age at the time of conception, family history of diabetes and body mass index, the presence of male fetus is considered to be an independent risk factor for poor beta cell function in the mother.<sup>3</sup> This conclusion was based on the study which involved a total of 1074 pregnant women who underwent metabolic characterization by performing oral glucose tolerance test (OGTT) at mean 29.5 weeks gestation. The prevalence of gestational diabetes, insulin resistance determined by HOMA was evaluated and compared between 534 women who were carrying a female fetus with 540 females who were carrying a male fetus. Women carrying a male fetus had a higher odds ratio of developing GDM (odds ratio 1.39-95%confidence interval 1.01-1.90). They concluded that male fetus is associated with poorer beta cell function, higher post prandial glycemia and an increased risk of GDM in mother.<sup>3</sup> Thus fetal sex is potentially capable of influencing maternal glucose metabolism in pregnancy.

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Although the risk of developing gestational diabetes associated with carrying a male fetus is very modest but nevertheless, it supports the concept of fetal influence on maternal physiology. The evidence that male fetus increases the risk of gestational diabetes suggests that further studies should be undertaken to explore the relationship between maternal and fetal physiology. There could be an important metabolic relationship between the mother and her growing fetus that needs to be studied further in greater details.

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## Conflicts of interest

The author declares there are no conflicts of interest.

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