Type 2 diabetes genes linked with gestational diabetes in South Asian women

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The same complex genetics that contribute to a higher risk of type 2 diabetes may also increase the risk of developing diabetes during pregnancy among women of South Asian descent, a study published

today in *eLife* shows.

The discovery may lead to new ways to identify women who would benefit from interventions to prevent diabetes during pregnancy.

People of South Asian descent have an elevated risk of developing type 2 diabetes. Women in this group are also twice as likely as women of European descent to develop a condition called gestational diabetes during pregnancy. But why South Asians are at an increased risk of these two conditions is not currently clear.

"Only a handful of studies have looked at how genetic and environmental factors interact in gestational diabetes in South Asian women," says lead author Amel Lamri, a research associate at McMaster University and Population Health Research Institute (PHRI) in Ontario, Canada. "None have looked at how the genes associated with type 2 diabetes may interact with environmental factors to contribute to gestational diabetes in South Asian women."

To close this gap, Lamri and colleagues assessed the relationship between genes associated with type 2 diabetes, environmental factors, and gestational diabetes. They examined whether having genetic signatures linked with type 2 diabetes risk is also connected with gestational diabetes in 837 and 4,372 South Asian women who participated in the SouTh Asian BiRth CohorT (START) and the Born in Bradford (BiB) studies respectively.

The team measured the genetic risk of type 2 diabetes using a polygenic risk score, which estimates the hereditary risk of an individual developing a disease based on the number of risk alleles they have. The researchers found that South Asian women with higher type 2 diabetes polygenic risk scores also had a higher risk of gestational diabetes; each incremental increase in the score was associated with a 45% increase in

the risk of developing this condition.

When the scientists studied the gestational diabetes risk at the population level, they found that having a polygenic risk score in the highest one-third explained 12.5% of the risk of developing this condition in South Asian women. When they combined a family history of type 2 diabetes and having a polygenic risk score in the top third, it explained 25% of the risk of developing gestational diabetes.

"These results show that a higher type 2 diabetes polygenic risk score and a family history of diabetes are strongly and independently associated with gestational diabetes in women of South Asian descent," explains Lamri.

The scientists also looked at whether environmental factors modulated these genetic risk factors. Most of the environmental factors they considered (with the possible exception of body mass index and diet quality) did not significantly alter the risk of diabetes during pregnancy in both studies. But the authors note that the studies may not have been large enough to detect more modest environmental effects, and that further studies are needed in order to confirm the modulatory effects they observed .

"Our results support the idea that type 2 diabetes and gestational diabetes share a common genetic background," concludes senior author Sonia Anand, the Michael G. DeGroote Chair in Population Health, and a senior scientist at PHRI, McMaster University, and Hamilton Health Sciences. "If future studies confirm our results, this information may help identify which women would benefit most from interventions to help prevent diabetes during pregnancy."

More information: Amel Lamri et al, The genetic risk of gestational diabetes in South Asian women, *eLife* (2022). DOI:

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