Researchers have discovered new links between miscarriage and maternal genes

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Triin Laisk, a Senior Research Fellow at the Estonian Genome Center. Credit: Reedik Mägi

Researchers at the Estonian Genome Center at the University of Tartu have described hitherto undiscovered associations between miscarriage and maternal genes. They have published their findings in *Nature Communications*.

Miscarriage is the most common complication of pregnancy, affecting about 15% of clinically confirmed pregnancies. Although, the risk of miscarriage increases with maternal age, and has been associated with number of different reasons, up to two-thirds of miscarriages are unrecognized or undiagnosed and causal underlying factors remain largely unknown.

Researchers have found that miscarriage has a genetic component, though most previous studies focused on associations of single maternal genetic variants with recurrent miscarriage. Furthermore, the majority of these studies have had small sample sizes, and as a consequence, found largely inconsistent results. "Our study involved a large number of women whose gene variants were examined throughout the genome to find risk factors for sporadic or consecutive miscarriages," explained Triin Laisk, the first author of the paper and a Senior Research Fellow at the Estonian Genome Center.

Results show that miscarriage etiopathogenesis is partly driven by genetic variation potentially related to placental biology. Additionally, analysis of health outcomes associated with miscarriage confirms previous observations and identifies several novel ones, such as associations with asthma, depression and irritable bowel syndrome. Authors also noted links between smoking, mental health and general well-being and miscarriage. "Although previous studies have shown that miscarriage increases the risk of depression and cardiovascular diseases, the underlying reasons are unknown. However, genetic research will help us better understand what could be behind such associations," said Laisk.

The study only assessed the effect of maternal genetics on the risk of miscarriage. According to Laisk, further investigation into paternal and fetal genomes should be carried out to better understand the causes of miscarriage. "Although this study of maternal genetic variation shed

some light on the causes of miscarriage , further research is definitely needed. In the future, we could know more about the biology behind a successful pregnancy and also about the long-term impact of miscarriage on overall health," added Laisk.

The study formed the basis of an international consortium that will continue to study the genetic causes of miscarriage. Authors analyzed genetic information of 420,000 women and data were collected from biobanks around the world, including from the Estonian population-based biobank. "The results of this study illustrate the utility of large-scale biobank data for understanding this pregnancy complication," concluded Laisk.

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