

New findings on the role of the mother in type 2 diabetes

May 18 2016

Research from Lund University in Sweden can explain why type 2 diabetes is inherited to a greater extent from an individual's mother. The heredity of a previously known risk gene, THADA, has proven to be dominant if it comes from the mother, whereas it has little or no effect on the child's risk of disease if it originates from the father. "Our research contributes to increased knowledge about the role of the mother and father in the heredity of type 2 diabetes," says Rashmi Prasad.

The causes of type 2 [diabetes](#) are a combination of heredity and environment. However, only up to 15 percentage of the heredity can be explained by genetic factors discovered till date.

Leif Groop, the Lund University professor responsible for the new study, has contributed to a large extent to our current knowledge about heredity and type 2 diabetes. He participated in the first major genetic mapping presented in 2012, which identified a large number of risk genes for type 2 diabetes. He was also part of a Finnish study, which showed in 1996 that the hereditary risk is greater if the mother has type 2 diabetes.

The new study combines knowledge from the previous investigations with new genetic analyses of families in which one parent and a child suffer from type 2 diabetes. The findings from the study explain how the heredity of the disease is passed down within families, whether it comes from the mother or the father. The researchers used data and DNA gathered from two of the world's largest family studies, the Botnia study

in Finland and the Transdanubian Biobank in Hungary. In total, around 4000 families were included in the study of which 2000 were used for the current study.

The results show that the variations in two previously identified risk genes for type 2 diabetes, *KCNQ1* and *THADA*, cause an increased risk of acquiring the disease in the child if they are inherited from the mother (known as the parent-of-origin effect). Inheriting the risk genes from the father, on the other hand, has less or no effect on the risk of disease for the child.

Researchers have previously identified the role of *KCNQ1* in heredity between mother and child.

"*THADA* proved to play an even more important role in the transfer of heredity from the mother to the child, and this was previously completely unknown," says Rashmi Prasad, responsible for the analyses.

According to the researchers, the fact that the genes inherited from the mother affect the risk of disease probably depends on the genes from the father being silenced in a process known as imprinting. Age and environmental factors expose the genes to chemical changes, known as methylation, which affect their function and in some cases silence the genes.

Thus the lifestyle of the mother, with factors such as stress, diet, illness etc., probably affects the future risk of [disease](#) in the foetus.

"Even if the father's lifestyle also affects the future child to some extent, the foetus is exposed for a longer time in utero and during breast-feeding to the influence of the mother's life and habits. This could explain why heredity from the mother has a greater effect on the [child](#)'s genome," says Leif Groop.

The findings are published in the scientific journal *Diabetologia* and in an overview of [heredity](#) in type 2 diabetes.

More information: Rashmi B. Prasad et al. Excess maternal transmission of variants in the THADA gene to offspring with type 2 diabetes, *Diabetologia* (2016). [DOI: 10.1007/s00125-016-3973-9](https://doi.org/10.1007/s00125-016-3973-9)

Provided by Lund University

Citation: New findings on the role of the mother in type 2 diabetes (2016, May 18) retrieved 25 April 2024 from <https://medicalxpress.com/news/2016-05-role-mother-diabetes.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.