

Research seeks to demystify obesity's link to type 2 diabetes

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A recent study sheds light on the factors that make some people more at risk of developing type 2 diabetes than others and the complex role body weight plays in the prevalence of the condition.

The study is [published](#) in the journal *Diabetes*.

Dr. Hanieh Yaghootkar, Senior Lecturer in Precision Health at the University of Lincoln, UK, led the research, which examined clusters of genetic variants associated with measurements of [body fat](#). Some of these clusters include genes that increase body fat but reduce the risk of type 2 [diabetes](#).

Type 2 diabetes is a condition with many risk factors, including genetics, age, ethnicity and bodyweight. While around 90% of adults with type 2 diabetes aged under 80 are categorized as overweight or obese, just 7% of all UK adults have a diagnosis of type 2 diabetes, and yet the proportion of the adult population who are overweight or obese is much greater, at nearly two-thirds.

Dr. Yaghootkar's research aims to explore why the majority of people who are overweight and obese do not develop type 2 diabetes.

The various traits of the clusters were investigated to explore how different types of body fat can influence type 2 diabetes risk. The researchers found that having higher body fat can increase the risk of type 2 diabetes due to factors including inflammation and higher cholesterol. They also found evidence for two main ways by which higher body fat could reduce the risk of type 2 diabetes.

The first way involved having more fat stored under the skin, with lower levels of liver fat and better insulin sensitivity. The liver plays a crucial role in maintaining blood sugar levels, and to function well it should contain little or no fat. This body type was also linked with lower risks of diabetes-related complications. The second protective mechanism involved a larger body size, coupled with better muscle quality.

These insights show that not all body fat affects health in the same way,

and understanding these differences has the potential to help the development of more specific advice for managing body fat and reducing the risk of type 2 diabetes.

Dr. Yaghootkar said, "Our findings underscore the complex nature of the relationship between obesity and type 2 diabetes and help explain why individuals with similar levels of body fat can have vastly different risks of developing cardiometabolic diseases like type 2 diabetes. By identifying specific mechanisms and subtypes of adiposity, it is possible to inform more effective precision medicine strategies. This might lead to more targeted approaches to managing type 2 diabetes and related conditions, which could ultimately improve patient outcomes."

As the Head of the Precision Health research group at the University of Lincoln and a Diabetes UK RD Lawrence Fellow, Dr. Yaghootkar's ultimate goal is to develop personalized prediction models and understand the underlying mechanisms of complex diseases. By identifying causal biomarkers for various diseases, the team aims to promote more personalized and precise health care.

Dr. Elizabeth Robertson, Director of Research at Diabetes UK, said, "This research takes us a step closer to understanding the genetic reasons why some people living with obesity or overweight develop type 2 diabetes and why others are naturally protected.

"Early and accurate identification of those who are at greater risk of type 2 diabetes could help improve the way we predict, prevent and treat the condition. It's important to remember that type 2 diabetes is a complex condition with many risk factors and that people with a genetic susceptibility to type 2 diabetes can still take steps to reduce their risk, including by losing weight to reduce levels of fat in their liver."

More information: Angela Abraham et al, Genetic Evidence for Distinct Biological Mechanisms That Link Adiposity to Type 2 Diabetes: Toward Precision Medicine, *Diabetes* (2024). [DOI: 10.2337/db23-1005](https://doi.org/10.2337/db23-1005)

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