Recent genetic study links belly fat with type 2 diabetes and coronary heart disease.

The most recently conducted genetic study signalizes that the accumulation of abdominal fat is a major risk factor for development of **type 2 diabetes** and **coronary heart disease** (**CHD**). In particular, the research points that individuals with a genetic predisposition to abdominal type of obesity are at greater risk of elevated triglycerides, serum glucose and arterial blood pressure. The risk factors are associated with the development of the two aforementioned conditions.

The study demonstrates that increased **waist-to-hip ratio** and increased **body mass index** (BMI) are external manifestation of the accumulation of visceral fat, which is a precondition for the development of type 2 diabetes and CHD.

Why other studies were failing to prove this linkage?

Those who were previously seeking to prove the link between the abdominal obesity and subsequent metabolic disease weren't able to give an eloquent result due to misinterpretation of factors such as the lifestyle of patients. What would eliminate those difficulties is the disclosure of the exact mechanism, which links the genetic predisposition to accumulation of fat around the waist and increased insulin resistance.

The study was conducted between 2007 and 2015 and the researchers collected information from 322.154 patients enrolled in four genome wide-association studies as well as other 111.986 individuals whose genetic information was investigated and preserved since 2007 to 2011 in the UK Biobank. The patients have an average age of 57 years and 52.5% of them are women. They also have waist-to-hip ratio of 0.875.

The scientists developed a special genetic scoring system, which comprises of 48 single nucleotide polymorphisms (SNPs) that are associated with abdominal obesity. The Mendelian randomization analysis then showed that the presence of polygenic predisposition to fat accumulation around the waist is closely associated with an increased risk of cardiometabolic disorders, and thus greater probability for developing type 2 diabetes and coronary heart disease.

In particular, the scientists found out that any increase in the waist-to-hip ratio (WHR) with just one standard deviation, results in elevated levels of triglycerides with 27mg/dL, 4.1-mg/dL higher 2-hour glucose levels, and 2.1–mm Hg higher systolic blood-pressure levels. Speaking in percentage, based on the genetic scores, one standard deviation in WHR raised the risk of CHD by 46% and the risk of type 2 diabetes by 77%.

These results draw three main conclusions:

1. The study clearly shows and confirms the relationship between the genetic predisposition and cardiometabolic disorders.

2. The results hypothesize that the fat distribution in the body is more precise criterion than the calculation of BMI. In addition, the WHR can also explain the variations in the risk of occurrence of type 2 diabetes and CHD observed in various subpopulations.

3. The WHR adjusted for body mass index (BMI) as a surrogate for visceral adiposity, was associated with increased risk of type 2 diabetes and CHD. In addition, this is a useful biomarker in the development of therapies aimed at prevention of the diseases. The hopes are that the results of this study lead to an increased interest in the synthesis of drugs that control fat distribution in the body.

The new findings put more weight to the contribution of belly fat to diabetes and heart disease. The results however do not prove that shedding belly fat would minimize one's risk of diabetes or heart disease, but it strongly suggests it would. Of course, it is still possible that the same genes that contribute to abdominal obesity to also lead to the development of diabetes and heart disease through other mechanisms.

The study "Genetic Association of Waist-to-Hip Ratio With Cardiometabolic Traits, Type 2 Diabetes, and Coronary Heart Disease" has been conducted by Connor Emdin, D.Phil., from Harvard Medical School, Boston, Massachusetts, and colleagues, and was published in an article on Feb. 14, 2017 in Journal of the American Medical Association.

Such major clinical trial is successfully completed during long period of time due to appropriate management of data. The use of a good CTMS integrates the entire data and simplifies what has been regarded as complex. In addition, such confirmative results are benefit for the global development of new understanding for the treatment of patients with type 2 diabetes and CHD.

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