

## The hidden face of abdominal fat

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*Translated from Le Journal de Montréal, March 20, 2017*

*A recent study confirms that excess fat around the abdomen considerably increases the risk of type 2 diabetes and of cardiovascular diseases.*

The **Body Mass Index** (BMI, in lbs/inch<sup>2</sup>) is often used to assess whether a person is overweight or obese. According to the criteria established by the World Health Organization, a BMI value between 19 and 25 is considered to indicate a normal weight, whereas people who have an index between 25 and 30 are overweight and those for whom the index tops 30 are considered to be obese.

This index is useful but it does not, however, take into account the way in which the excess fat is distributed within the body. For example, some people tend to accumulate fat around the abdomen, surrounding the visceral organs, and several observations indicate that this excess abdominal fat is particularly bad for the health.

### GENETIC PREDISPOSITION

Recent work by Dr. Jean-Pierre Després, of Laval University, has shown that a bigger waist size is associated with a marked increase in risk for hypertension, cardiovascular diseases and type 2 diabetes<sup>1</sup>. In other words, even if two people have identical BMI levels, it is the person with excess fat localized in the abdomen who is at much greater risk of developing health problems.

A recent genetic study, based on data obtained from genome-wide association studies, has just confirmed this link between abdominal fat and the risk of cardiometabolic diseases<sup>2</sup>. These genome-wide studies consist of identifying the genetic variants that are present in the collected genomes from a large number of people, and to determine which of these variants can be correlated with certain traits or diseases.

By closely examining the data collected during these studies, the scientists identified 48 variants in the DNA (polymorphisms) which represent a marker for the genetic susceptibility of a person to develop this form of being overweight. They then determined whether this genetic signature was correlated with an increased risk for cardiometabolic diseases.

And the results were quite clear-cut: people who were genetically predisposed to develop a wider waistline (independent of their BMI) exhibited elevated levels for several risk factors (blood lipids, glycemia, insulin, arterial pressure) and were also at higher risk of developing type 2 diabetes and coronary disease. These observations thus confirm that the distribution of fat and not simply an overall excess of fat (as measured by BMI) is largely responsible for the harmful effects of being overweight on health.

This discovery permits us to understand why excess weight leaves men at higher risk of coronary disease or diabetes than women, even when they have identical BMI levels: the men tend to



accumulate fat around the abdomen whereas the women usually have excess fat located in the thighs, where its effects on health is less pronounced.

### HYPERINSULINEMIA

One of the most damaging consequences of excess abdominal fat is the diminished effectiveness of insulin in stimulating the absorption of sugar by certain organs, notably the muscles, liver and adipose tissue. This resistance to insulin ensures that the quantity of sugar in the blood remains too high (clinically visible as a fasting blood glucose level higher than normal), which forces the pancreas to continually secrete more insulin in hopes of getting the sugar to enter the cells.

This overproduction is very problematic because an excess of insulin in the blood (hyperinsulinemia) is becoming recognized as being an important risk factor in a large number of diseases, not only coronary disease and diabetes but also several types of cancers. And all of this is without taking into account that another harmful effect of excess insulin, less well-recognized, is to prevent overweight people from losing weight because the excess insulin favors the storage of energy within adipose cells.

Thus a vicious circle commences: the more that a person gains weight, the greater their level of insulin increases and the more that their insulin levels is elevated, the more the person experiences hunger because he/she is unable to use the surplus energy now stored in the form of fat.

If it is important to keep a normal weight, it is equally important to prevent the generation of excess fat around the abdomen. Even if a little “beer belly” or some “love handles” are perhaps becoming the norm in our society, it must be understood that this excess fat is far from being metabolically inoffensive and even represents an important risk factor for chronic diseases.

<sup>(1)</sup> Després, JP. Body fat distribution and risk of cardiovascular disease: an update. *Circulation* 2012;126:1301-1313.

<sup>(2)</sup> Emdin, CA *et al.* Genetic association of waist-to-hip ratio with cardiometabolic traits, type 2 diabetes, and coronary heart disease. *JAMA* 2017;317:626-634.