

BMI not the only reliable indicator of heart disease

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Credit: Ayurvedic India (via Flickr)

Waist-to-hip ratio may be a stronger indicator of some cardiovascular illnesses than the commonly-used measure BMI, according to a new UCL-led study.

Previous research has concentrated on the relationship between BMI and risk of [cardiovascular illnesses](#). However, the large collaborative study, published today in *Circulation*, finds waist-to-hip ratio may be a stronger predictor of health issues such as coronary heart disease and stroke.

Researchers looked at multiple genetic variants linked to BMI and waist-to-hip ratio adjusted for BMI, as a measure of obesity and central body fat in up to 229,000 people. They found a clear causal relationship between increased BMI and central body fat with higher risks of coronary heart disease and type 2 diabetes.

The results also suggest that central body fat may have a stronger effect on stroke risk than BMI, but both [measurements](#) should be taken into account when estimating the impact of fat distribution on health. "While BMI is a successful indicator of risk for some diseases, we found waist-to-hip ratio may be a better indicator of risk for other diseases, especially stroke. While it is difficult to disentangle the two measures, waist-to-hip ratio should be considered as another valuable marker of risk," said first author of the study, Dr Caroline Dale (UCL Institute of Health Informatics, Farr Institute).

The large-scale genetic study is the most comprehensive causal assessment of the relationship between obesity and cardio metabolic diseases to date. The population studied included 66,842 cases for coronary heart disease, 12,389 new cases for stroke, and 34,840 cases for type 2 diabetes. Cardiometabolic traits such as high levels of 'bad' lipids and thicker carotid arteries were also analysed as indicators of disease.

"Instead of measuring BMI or waist-to-hip ratio directly we used a method called Mendelian randomization to minimise bias from these sources. This means that we measured the variation in genes known to be linked to BMI and waist-to-hip ratio to examine the causal effects on

different diseases. We found that although genetics are not a perfect predictor of cardiovascular problems in individuals they can be reliably used to measure disease risk from different measures of body fat in groups of people or populations," added Dr Dale.

Previously there have been many observational studies which have identified associations between obesity and the risk of developing [coronary heart diseases](#), stroke and type 2 diabetes. However, interpretation of these results can be misleading as association does not equal causation, and lifestyle factors such as smoking and weight loss – which can also result from chronic health conditions – may not have been taken into account.

Other studies have also shown consistent links between different measures of obesity – both BMI and waist-to-hip ratio – for both [chronic heart disease](#) and ischaemic stroke. A similar association has also been shown between measures of obesity and type 2 diabetes. In these studies, it is virtually impossible to separate the effects of BMI and waist-to-hip ratio from each other because they are so closely linked.

Professor JP Casas (UCL Institute of Health Informatics, Farr Institute), co-corresponding author, added, "Our findings indicate that the distribution of body fat plays multiple causal roles in diseases that are independent of general obesity. This indicates that physicians should pay attention to measures of obesity beyond BMI, as the measurement of such traits may offer additional information to help identify patients at risk of cardiovascular diseases. It also suggests that scientists and researchers need to find new approaches to tackling disease prevention targeting waist-to-hip ratio.

"This could include investigating traits that can mediate the relationship between waist-to-hip ratio and disease, which could influence the development of new drugs and disease preventions."

Dr Michael Holmes (MRC Population Health Research Unit, University of Oxford) said: "These findings add important information to our understanding of the role of body fat and risk of heart disease, stroke and diabetes. Our findings suggest that it is not just how much fat an individual has, or their weight, but rather, the distribution by which an individual stores fat that plays important roles in the development of [disease](#)."

More information: Caroline Dale et al. Causal Associations of Adiposity and Body Fat Distribution with Coronary Heart Disease, Stroke Subtypes and Type 2 Diabetes: A Mendelian Randomization Analysis, *Circulation* (2017). [DOI: 10.1161/CIRCULATIONAHA.116.026560](#)

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