

Study results confirm BMI is a direct cause of Type 2 diabetes and high blood pressure

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(Medical Xpress)—Using new genetic evidence, an international team of scientists led by experts at the Perelman School of Medicine at the University of Pennsylvania and Children's Hospital of Philadelphia has found that an increased body mass index (BMI) raised the risk for both type 2 diabetes and higher blood pressure. The results add to mounting evidence about the risks of obesity and are of major importance for the obesity pandemic that is affecting the United States – where two-thirds of adults are overweight or obese – and other countries.

According to the findings, published online in *The American Journal of Human Genetics*, for every 1 kg/m² increase in BMI – equivalent to a 196-pound, 40-year old man of average height gaining seven pounds – the risk of developing [type 2 diabetes](#) increases by 27 percent. The same

rise in BMI also increases blood pressure by 0.7 mmHg.

"Our findings provide solid genetic support indicating that a higher [body mass index](#) causes a raised risk of type 2 diabetes and [high blood pressure](#)," said the study's lead author, Michael V. Holmes, MD, PhD, research assistant professor of Surgery in the division of Transplant at Penn Medicine.

In the new study, the research team used a recently developed statistical tool called Mendelian randomization (MR), which helps researchers identify genes responsible for particular diseases or conditions (such as obesity), independent of potentially confounding factors such as differences in behavior and lifestyle, which can lead to false-positive associations. In this case, the use of MR virtually rules out the possibility that both a high BMI and type 2 diabetes are caused by a third, unidentified factor.

"Whether high BMI raises the risk of adverse outcomes is of critical importance given that BMI is modifiable," said Holmes. "Now that we know high BMI is indeed a direct cause of type 2 diabetes, we can reinforce to patients the importance of maintaining body mass within established benchmarks."

Results of the new study were based on the assessment of the genotypes for over 34,500 patients from previous studies. In addition to the results on diabetes and [blood pressure](#), Holmes and his colleagues found that an elevated BMI has potentially harmful effects on several blood markers of inflammation. While this could be tied to increased risk for [coronary heart disease](#), the researchers suggest it requires further study.

More information: Michael V. Holmes, et al, "Causal Effects of Body Mass Index on Cardiometabolic Traits and Events: A Mendelian Randomization Analysis," *The American Journal of Human Genetics*,

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[dx.doi.org/10.1016/j.ajhg.2013.12.014](https://doi.org/10.1016/j.ajhg.2013.12.014).

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