

People with severe obesity and a genetic pathway variant have increased risk of hypertension, new research finds

April 18 2023, by Jay Furst



Credit: CC0 Public Domain

Obesity and its associated cardiometabolic issues are a major health concern in the U.S. and internationally. According to a study published

in 2017, 12% of the world's adult population was affected by obesity in 2016, double the percentage from 30 years earlier.

With [obesity](#) comes an increasing risk of [cardiovascular disease](#), including stroke, congestive heart failure and myocardial infarction. Fortunately, obesity is a multifactorial disease that results from an energy balance dysregulation and often is a modifiable risk factor for cardiovascular disease.

"Body weight is regulated by a wide range of complicated interactions between heredity and [environmental factors](#)," says Lizeth Cifuentes, M.D., a Mayo Clinic gastroenterology researcher. "The heritability of obesity is estimated anywhere from 40% to 70%, but only about 10% of severe early-onset obesity is caused by genetic variants."

Those variants mainly are due to recessive mutations in genes of the leptin-melanocortin pathway, a pathway that is critical for regulating food intake and [body weight](#). These genetic variants are most prevalent in about 6% of children and 2.5% of adults with severe early-onset obesity.

Dr. Cifuentes and colleagues in the Precision Medicine for Obesity Program at Mayo Clinic wanted to study the differences in cardiovascular disease factors and disease in patients with a history of severe obesity, with or without genetic variants in that pathway.

"Understanding the effect of these variants on cardiovascular health would help clinicians address the modifiable risk factors for their patients with severe obesity," she says.

To do this, they conducted a cross-sectional study of participants of the Mayo Clinic Biobank who had a history of severe obesity, defined as a [body mass index](#) of 40 or above, or had bariatric surgery and were genotyped for variants in the hypothalamic leptin-melanocortin pathway.

The Mayo Clinic Biobank is a collection of medical samples—including blood and blood derivatives—and health information donated by Mayo Clinic patients and used in ongoing health research.

A total of 168 carriers of the genetic [variant](#) MC4R were identified, and the Mayo research team found that carriers had a higher risk of [hypertension](#) and reported more cardiovascular risk factors compared with 2,039 noncarriers.

"Adjusting for age, sex and body mass index, which could influence cardiovascular risk, did not affect our findings that carriers had an increased prevalence of hypertension," says Andres Acosta, M.D., Ph.D., principal investigator in the Precision Medicine for Obesity laboratory.

Carriers of the MC4R variant did not have an increase in cardiovascular disease or death, according to the findings, which are reported in an article in *Mayo Clinic Proceedings*. "We expected a higher prevalence of hypertension because excess weight gain predicts the development of hypertension," says Dr. Acosta, senior author of the study.

Dr. Cifuentes, the study's first author, says researchers were surprised that there was no consistent relationship with cardiovascular disease. "Given the complexity of the cardiovascular disease causal pathways, there simply may be a significant amount of unmeasured confounding data within our analyses," she says.

The study's importance for clinicians is to recognize that patients with obesity who have been genotyped and have heterozygous variants in the leptin-melanocortin pathway may not be protected from hypertension as has been previously believed. "These patients may need more aggressive attention to modifiable risk factors for hypertension, including individualized effective treatments for obesity," says Dr. Cifuentes.

Individuals with the genetic variants may have experienced obesity since childhood, but the duration was not documented in the cohort studied by the Mayo researchers, and more study is needed to determine the long-term risk of obesity and cardiovascular disease in people with genetic variants.

Among the study's limitations is that the self-reported race among participants in the Mayo Clinic Biobank cohort was 90% white, which means the generalizability of results to other populations may be limited.

More information: Lizeth Cifuentes et al, Cardiovascular Risk and Diseases in Patients With and Without Leptin-Melanocortin Pathway Variants, *Mayo Clinic Proceedings* (2022). [DOI: 10.1016/j.mayocp.2022.10.028](https://doi.org/10.1016/j.mayocp.2022.10.028)

Provided by Mayo Clinic

Citation: People with severe obesity and a genetic pathway variant have increased risk of hypertension, new research finds (2023, April 18) retrieved 8 May 2024 from <https://medicalxpress.com/news/2023-04-people-severe-obesity-genetic-pathway.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.