New genetic markers for a rarer form of type 1 diabetes

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While most cases of type 1 diabetes are classified as autoimmune diseases, a minor proportion of these patients have non-immune-mediated type 1 diabetes, sometimes referred to as type 1 B diabetes.

Researchers from Children's Hospital of Philadelphia (CHOP) have identified 41 previously unreported genetic markers for this less common version of type 1 diabetes. Additionally, 16 of these markers have been linked to autism spectrum disorder in previous studies, suggesting there may be a genetic link between the two conditions. The findings were recently published in the journal *Communications Biology*.

Roughly 5 to 10% of Caucasian patients diagnosed with type 1 diabetes have a non-autoimmune diagnosis. Previous studies suggested that different mechanisms must be at play. In this study, CHOP researchers and collaborators studied 18,949 patients of European ancestry including 6,599 patients with type 1 diabetes and 12,323 control patients. The study found 957 patients with low genetic risk scores of type 1 diabetes, and through a genome wide association study (GWAS)-focused analysis, these patients contributed to the 41 new genetic markers we uncovered for type 1 diabetes.

Two of these newly identified markers were considered common variants, and one marker was associated with interferon signaling related to viral infection with influenza, which supports prior findings that viral infections may not only trigger, but potentially cause certain cases of type 1 diabetes. Other markers were related to pancreatitis, higher body mass index, and obesity, all conditions that increase the risk of developing type 1 diabetes.

"More research will need to be done to determine the exact nature of what effect these genetic loci have on the development of type 1 diabetes and whether they are truly distinct from the genetic causes of the autoimmune form of the disease," said senior author Hakon Hakonarson, MD, PhD, Director of the Center for Applied Genomics at CHOP. "These rare variants may suggest the possibility of rare syndromic types of disease that has clinical features of both type 1 diabetes and autism spectrum disorder that has not previously been

identified."

More information: Hui-Qi Qu et al, Genetic architecture of type 1 diabetes with low genetic risk score informed by 41 unreported loci, *Communications Biology* (2021). DOI: 10.1038/s42003-021-02368-8

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