

Using Genetic and Other Factors to Predict Risk for Type 2 Diabetes

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The full report is titled “Joint Effects of Common Genetic Variants on the Risk for Type 2 Diabetes in U.S. Men and Women of European Ancestry.” It is in the 21 April 2009 issue of *Annals of Internal Medicine* (volume 150, pages 541-550). The authors are M.C. Cornelis, L. Qi, C. Zhang, P. Kraft, J. Manson, T. Cai, D.J. Hunter, and F.B. Hu.

What is the problem and what is known about it so far?

Traditional risk factors for type 2 diabetes include older age, family history of type 2 diabetes, and overweight. Doctors can use these risk factors to estimate the chances that a patient will develop diabetes. Genetic factors are also linked to a person’s risk for type 2 diabetes. However, when considered 1 at a time, these factors are not very strong predictors. Combining genetic factors might improve the ability to predict the risk for diabetes. Because genetic factors are expensive to measure, to be useful, they need to be substantially better at predicting who will develop diabetes than methods that use only traditional risk factors.

Why did the researchers do this particular study?

To find out whether measuring several genetic factors associated with type 2 diabetes and combining them into a “genetic risk score” provides useful information about a person’s risk for type 2 diabetes beyond measurement of the individual genetic factors and traditional risk factors.

Who was studied?

2809 persons with type 2 diabetes and 3501 healthy persons who had participated in 1 of 2 large studies that examined the risks for the disease.

How was the study done?

When the participants enrolled in the study, the researchers collected information about traditional risk factors and took blood samples to test for 10 genetic factors previously linked to type 2 diabetes.

What did the researchers find?

Combining the 10 genetic factors into a genetic risk score improved the prediction of type 2 diabetes after adjustment for age and body size. The improvement was small; however, the genetic risk score may be useful to identify high-risk groups. For example, participants who had a family history of type 2 diabetes and the highest level of genetic risk score were much more likely to develop diabetes than those without a family history and with a low genetic risk score.

What were the limitations of the study?

The researchers did not have information on blood sugar levels, which are strong predictors of type 2 diabetes. The study included only white people of European backgrounds, so the results might not apply to people of other ethnic backgrounds.

What are the implications of the study?

A genetic risk score that combines single genetic factors can improve the prediction of who will develop type 2 diabetes, but this improvement is minimal beyond prediction with easily available traditional risk factors.

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