Hypothetical case suggests genetic testing has significant limitations for predicting disease in a healthy patient

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Despite its utility as a diagnostic tool in patients with specific risk factors for genetic disease, genetic testing still has significant limitations for predicting disease in a healthy patient. Authors from Colombia

University used a hypothetical case to illustrate differences between diagnostic testing and predictive genetic screening for prevention purposes, focusing on available clinical tests. Their case report is published in *Annals of Internal Medicine*.

Healthy patients increasingly inquire about genetic testing as a tool for predicting diseases, such as cancer, heart disease, or dementia. In practice, most genetic testing is done in affected persons as a diagnostic tool or in healthy persons at high risk for genetic disease based on family history. Much less is known about the predictive value of genetic tests to screen healthy persons with no clear risk for genetic disease.

The researchers summarized current knowledge using on the hypothetical case of a healthy 35-year-old woman requesting genetic testing to predict her future risk for disease. Her maternal aunt and a male cousin had coronary heart disease by age 50 and a paternal aunt died of breast cancer at age 56. The scope of the genetic test can be determined on the basis of the risk profile and family history as well as the patient's concerns about specific diseases. For this patient, several genetic tests would be available, yet their value for predicting future disease could be very limited.

According to the researchers, in the diagnostic framework, detection of a pathogenic variant consistent with a person's clinical condition can establish a diagnosis of genetic disease. In the predictive framework, interpretation of genetic results is more complicated given the large number of putative pathogenic variants and the paucity of information about their clinical consequences. Even if the patient's genetic test revealed a genetic risk to a specific illness or illnesses, in most cases, the likelihood that she would develop the disease is not known Based on what is currently known about genetic testing as a predictive tool, the researchers conclude that a Bayesian framework is useful for assessing future risk of disease and predictive testing in clinical practice should be

limited to genes where there is strong evidence linking mutations to high risk of disease.

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