Medical Xpress

Genomic data could help doctors know whether to prescribe statins

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Genomic data could predict whether statins will benefit a patient or not, according to an article in the open access journal *Genome Biology*. The research suggests that genomic data alone can explain around 15% of patients' responses to a cholesterol-lowering statin, and further studies could increase the accuracy of these predictions.

The study looked at data from 372 participants in an American clinical trial for the statin, Simvastatin, and found that certain genetic signatures were more common in patients whose cholesterol was effectively lowered by the treatment, while others were associated with patients who hadn't responded so well. It was possible to predict how 15% of the patients would respond to statins, and this data could help clinicians to make a decision about whether to prescribe statins for individual patients.

Statins are used to try to lower patients' levels of cholesterol, a type of fat which is carried in the blood and can block arteries. While they reduce rates of heart disease in many patients, clinicians have debated whether they should be prescribed widely, because they have significant side-effects which some argue outweigh the benefits. Being able to predict which patients will respond to the drugs will help clinicians better target their prescription of the drugs and improve treatment outcomes.

This study, by scientists from the Children's Hospital Oakland Research Institute, investigated whether there were any genetic signatures that

were associated with whether a statin lowered patients' LDL-cholesterol levels. They used data from Caucasian, non-smoking participants in a clinical trial for the drug Simvastatin. Looking back at the anonymized data, they were able to see which patients responded well to the treatment and which didn't, and compare those reactions to the data about their genomic profiles and gene expression.

They found that differences in around 100 genes could explain 12-17% of the variation in how effectively the statin lowered patients' LDL-cholesterol. The genes were particularly accurate in predicting the patients that responded very well or very poorly to the treatment. Some of these genes were involved in cholesterol metabolism, but further studies are needed to find out about the function of the others.

Because the paper only uses data from Caucasians from a single clinical trial cohort, the authors say that further study is needed to find out whether these genes are a good indicator in other populations.

  More information: Prediction of LDL cholesterol response to statin using transcriptomic and genetic variation, Kyungpil Kim Eugene Bolotin Elizabeth Theusch Haiyan Huang Marisa W Medina and Ronald M Krauss, *Genome Biology* 2014 15: 460.
genomebiology.com/2014/15/9/460

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