The Effect of Disclosing Genomic Risk of Coronary Heart Disease on Low-density Lipoprotein Cholesterol Levels: The Myocardial Infarction Genes (MI-GENES) Study

Iftikhar J Kullo, Hayan Jouni, Iyad Isseh, Erin Austin, Teresa Kruisselbrink, Sherry-Ann Brown, Mayo Clinic, Rochester, MN; Robert C Green, Mayo Clinic, Boston, MA; Victor Montori, Raad Haddad, Daniel Schaid, Mayo Clinic, Rochester, MN; Ulrich Broeckel, Medical Coll of Wisconsin, Milwaukee, WI; Kent R Bailey, Mayo Clinic, Rochester, MN

BACKGROUND
Whether knowledge of genetic risk for coronary heart disease (CHD) affects health-related outcomes is unknown. We investigated whether disclosure of a genetic risk score for CHD lowers low-density lipoprotein cholesterol (LDL-C) levels.

METHODS
The randomized clinical trial was conducted in 203 residents of Olmsted County, who were 45-65 years old, at intermediate risk for CHD, and not on statins. Participants were randomized to receive their 10-year probability of CHD based either on conventional risk factors (CRS) or CRS plus a genetic risk score (+GRS). Participants in the +GRS group were stratified as having high (+H-GRS) or average/low (+L-GRS) genetic risk score. We compared the primary endpoint of LDL-C levels at 6 months following disclosure of CHD risk in the study arms. Secondary outcomes included dietary fat intake, physical activity, anxiety levels and statin use.

RESULTS
Participants [n= 203, mean age 59.4 (5) years, 49% men, mean 10-year CHD risk 8.5 (4.1)%] were allocated to receive either CRS (n=100) or +GRS (n=103). At the end of the study, the +GRS group had lower LDL-C levels than the CRS group [96.5 (32.7) vs. 105.9 (33.3) mg/dL; P=0.04]. +H-GRS participants had lower LDL-C levels [92.3 (32.7) mg/dL] than CRS participants (P=0.02) but not +L-GRS participants [100.9 (32.2) mg/dL; P=0.18]. The overall downward longitudinal trend in LDL-C was significantly greater in +GRS than in CRS (P=0.04). Use of statins was greater in the +GRS group than in the CRS group (39% vs. 22%, P<0.01). No significant differences in dietary fat intake, physical activity and anxiety levels were present.

CONCLUSION
Disclosure of CHD risk estimates that incorporated genetic risk information led to lower LDL-C levels than disclosure of CHD risk based on conventional risk factors alone.
Disclosure:
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