Commentary on Viewpoint: Perspective on the future use of genomics in exercise prescription

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TO THE EDITOR: Interestingly, Dr. Roth (4) poses a “gene profile”-based personalized exercise prescription strategy, with delayed exercise prescription following non-lifestyle intervention in individuals with adverse response profiles. Some remarks that might need consideration: variability in training responses is only partially genetic. The design of a useful set of “adverse” or “positive” (interacting) alleles or haplotypes still needs a large amount of (confirmatory) work in family-based or large population-based association studies in healthy subjects and patients. An example of the latter is the CAREGENE study (2) that aims to identify genetic variability in cardiorespiratory rehabilitation responses in coronary artery disease patients. Genome-wide association studies, differential gene-expression profiles, copy number variation analysis (5), and epigenetic differences (3) between positive-adverse response groups might guide us in this effort. However, in any human exercise and/or rehabilitation study, dietary and other influential factors need to be standardized/controlled to exclude adverse effects based on confounders.

Identification of causal “adverse exercise response genes” might feed people’s ideas of external, non-changeable causality, identifying themselves as “genetic” nonexercisers. As behavioral change is highly challenged in sedentary subjects, careful communication on adverse genetic profiles and useful exercise prescription as a (delayed) intervention for other health-related phenotypes is needed. Activity levels are likely related to (dis-)liking exercise, personality characteristics, and perception of exercise benefits, and these might themselves be regulated by genetic profiles (1) that act pleiotrophic on other health risk phenotypes.

Application of differential genetic screening strategies also implies physicians to assess and monitor the exercise response of their patients and necessitates a close cooperation with exercise professionals.

REFERENCES