Physical activity can reduce the genetic predisposition to obesity by 40 percent

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Although the whole population can benefit from a physically active lifestyle, in part through reduced obesity risk, a new study shows that individuals with a genetic predisposition to obesity can benefit even more. The research, carried out by Dr. Ruth Loos from the Medical Research Council Epidemiology Unit in Cambridge, United Kingdom, and colleagues, published in this week's *PLoS Medicine* suggests that the genetic predisposition to obesity can be reduced by an average of 40% through increased physical activity.

The authors used a cohort study of 20,430 people living in Norwich, UK and examined 12 different genetic variants which are known to increase the risk of obesity. The researchers tested how many of these variants each study participants had inherited from either parent. They then assessed the overall genetic susceptibility to obesity by summing the number of variants inherited into a 'genetic predisposition score'. Most individuals inherited between 10 and 13 variants, but some had inherited more than 17 variants, while others fewer than 6.

In addition the researchers assessed occupational and leisure-time physical activities in each individual by using a validated self-administered questionnaire. The researchers then used modeling techniques to examine whether a higher 'genetic predisposition score' was associated with a higher body mass index (BMI)/obesity risk and, most importantly, they also tested whether a physically active lifestyle could attenuate the genetic influence on BMI and obesity risk.

The researchers found that each additional genetic variant in the score was associated with an increase in BMI equivalent to 445g in body weight for a person 1.70 m tall and that the size of this effect was greater in inactive people than in active people. In individuals who had a physically active lifestyle, this increase was only 379 g/variant, or 36% lower than in physically inactive individuals in whom the increase was 592 g/variant. Furthermore, in the total sample each additional obesity-susceptibility variant increased the odds of obesity by 1.1-fold. However, the increased odds per variant for obesity risk were 40% lower in physically active individuals (1.095 odds/variant) compared to physically inactive individuals (1.16 odds/variant).

These findings challenge deterministic views of the genetic predisposition to obesity that are often held by the public, as they suggest that even people at greater genetic risk of obesity can benefit from adopting a healthy lifestyle.

The authors say: "Our findings further emphasize the importance of physical activity in the prevention of obesity."

More information: Li S, Zhao JH, Luan J, Ekelund U, Luben RN, et al. (2010) Physical Activity Attenuates the Genetic Predisposition to Obesity in 20,000 Men and Women from EPIC-Norfolk Prospective Population Study. PLoS Med 7(8): e1000332. doi:10.1371/journal.pmed.1000332