thebmj

BMJ 2018;360:k7 doi: 10.1136/bmj.k7 (Published 10 January 2018)

EDITORIALS

Diet, genes, and obesity

Genetic predisposition to obesity is no barrier to successful weight management

Louisa J Ells *reader in public health and obesity*[1], Alessandro Demaio *medical officer*[2], Nathalie Farpour-Lambert *program director*[3]

[1]School of Health and Social Care, Teesside University, Middlesbrough, UK; [2]Department of Nutrition for Health and Development, World Health Organization, Geneva, Switzerland; [3]Obesity Prevention and Care Program Contrepoids, University Hospitals of Geneva, Geneva, Switzerland

Globally, the prevalence of obesity has tripled since 1975, with 671 million adults and 124 million young people (5-19 years) estimated to be affected in 2016.[1] Given the serious associated health and economic consequences of obesity,[2-4] finding effective weight management strategies is both a national and a global priority.[5 6]

Although behavioural interventions that improve dietary intake and increase physical activity can be effective in reducing body weight in adults, long term efficacy is often limited,[7 8] and it can be tempting to attribute failure to a genetic predisposition. Such discussions risk promoting a perception that policies and interventions to tackle obesity are futile, leading to loss of commitment and associated resources. Family, twin, and adoption studies show a moderate to high heritability for obesity,[9] but monogenic causes of obesity are rare. Genetic predisposition in most people is polygenic. Important analyses of environment-gene interactions clearly show the detrimental effect of our obesogenic environment.[9 10]

The linked study by Wang and colleagues (doi:10.1136/bmj.j5644) examined the interaction between adherence to healthy dietary patterns and genetic predisposition to obesity in relation to long term weight loss.[11] The authors assessed changes in body mass index and body weight between 1986 and 2006 in 8828 women and 5218 men from two large cohorts of US health professionals. Healthy dietary patterns were assessed using three dietary indices: the Alternate Healthy Eating Index 2010 (AHEI-2010), Dietary Approach to Stop Hypertension (DASH), and the Alternate Mediterranean Diet (AMED). The authors found that the association between a healthy diet and weight loss was stronger in participants with a greater genetic predisposition to obesity.

As with many genetic association studies, the effect of genetic predisposition was small. However, the findings provide encouraging new evidence that although a better diet can improve weight loss, the effect may be greatest in those with the highest genetic predisposition for obesity. The findings also complement previous studies undertaken by the study authors and others,[12-14] showing that unhealthy products such as sugar sweetened drinks and fried food can magnify genetic associations with increased body mass index.

Both strands of evidence illustrate the importance of healthy dietary patterns in the prevention of weight gain, particularly in people at greatest risk. Wang and colleagues' findings further support the importance of national and international guidelines that define and promote adherence to healthy dietary patterns,[15 16] and help to dispel misconceptions that a genetic predisposition will inhibit successful weight management.

The authors acknowledge that the underlying biological mechanism driving the observed interaction remains unclear, and further research to characterise these mechanisms and explore the clinical implications of the findings would be helpful. They also acknowledge limitations including the influence of unmeasured confounders such as physical activity, the non-randomised adherence to healthy dietary patterns, and possible reverse causality. These considerations are important given the complex multifactorial nature of obesity.[17] Furthermore, the results are generalisable only to other populations of health professionals of European descent.

The advantages of consuming a healthy diet are clear, but it is important to acknowledge the challenges of achieving this in an obesity promoting environment in which unhealthy food options are cheap, readily available in large portions, and heavily marketed. These findings reinforce the critical urgency of comprehensive policies that prioritise healthy food environments and systems, with an emphasis on vulnerable populations. These include fiscal policies and subsidies supporting healthy eating through pricing, improved product nutrition through reformulation, urban planning and zoning laws that ensure healthier food environments, childcare and school based food programmes that provide healthy food early in life, the protection of young people and families from the marketing of unhealthy products, trade and investment decisions that give healthy diets top priority, and closer congruence between government agricultural subsidies and national dietary recommendations.[18-25] Finally, consumers must be empowered

Correspondence to: L Ells l.ells@tees.ac.uk

to make more informed choices through package labelling and portion size guidelines.[26]

In the newly announced United Nations Decade of Action on Nutrition,[27] Wang and colleagues' study underlines the critical importance of achieving healthy diets for everyone. This is still a challenge for many, however,[28] with poor diet being a leading risk factor for death and disability globally.[29] Genetic predisposition is no barrier to successful weight management and no excuse for weak health and policy responses. Through evidence based and cost effective interventions at both individual and societal levels, governments and populations must act to ensure universal healthy diets within health promoting food environments and food systems. This must become the new normal. Only then will we begin to curb and ultimately reverse the global epidemic of obesity.

Competing interests: We have read and understood the BMJ policy on declaration of interests and declare the following: AD is a fulltime staff member for the World Health Organization; this article was written in his personal capacity, and its contents do not reflect the policies or views of any third party. LJE has a part time secondment to Public Health England but wrote this editorial in her role as Reader in public health and obesity at Teesside University.

Provenance and peer review: Commissioned; not peer reviewed.

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