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Nutrigenetics and obesity: Towards personalized nutrition

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The concept of "Personalized" Medicine is now being extended to the field of Nutrigenetics, which investigates the impact of gene variation responses to intake of different nutrients. The ability of Nutrigenetics to determine what nutrients will produce the desired impact on metabolic balance (as influenced by individual genetic make-up) is at the core of Personalized Nutrition. Obesity is a heritable trait that arises from the interactions between multiple genes and lifestyle factors such as diet and physical inactivity. Dietary factors play an important role in the development of obesity because of the variation in the food that is being consumed in different parts of the world. Although several studies have examined the gene x nutrient interactions, the findings have been quite inconsistent and hence, unable to develop an optimum diet for each ancestral population. Some of the challenges in performing nutrigenetics research are 1) genetic heterogeneity, 2) lack of understanding of the metabolic pathways, 3) low numbers of genetic variants tested per gene and thus incomplete coverage of the common variation and 4) insufficient sample size and thus low statistical power. Hundreds of candidate genes for obesity-susceptibility had been identified through various approaches; however, consistent associations have been reported for only a handful of these candidate genes. With genome-wide association study (GWAS) data now available on numerous large cohorts, it has become possible to embed candidate gene studies within GWASs, testing for association on a much larger number of candidate genes than previously possible. The talk will highlight three main aspects: 1. Candidate gene and GWA studies, 2. Nutrigenetics and Personalized Nutrition, and 3. Mendelian Randomization.

Biography

Vimal Karani S is a lecturer in Nutrigenetics at the University of Reading, UK. He did his post-doctoral training at the MRC Epidemiology unit (Cambridge, UK) and University College London (UK). He has an interdisciplinary academic background, with qualifications from Medical Genetics, Bioinformatics, Molecular Biology and Genetic Epidemiology. His primary research interests focus on the investigation of gene-nutrient interactions on metabolic- and CVD-related outcomes using combined approaches from genetic epidemiology, statistical genetics and molecular biology. His long term goal is to use the findings from observational studies to carry out human intervention studies with a view towards developing industrial collaborations to facilitate 'Personalized Nutrition'.

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