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Editor's Desk

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Precision lifestyle medicine in obesity and type 2 diabetes

Obesity and type 2-diabetes are major global problems, with both genetic and environmental causes. There seems to be-individual variability in susceptibility to lifestyle risk factors like diet, physical activity and environmental factors and response to therapies .There is an unmet need for more effective lifestyle therapies.

There is strong evidence to suggest that a person's glycaemic response to food is likely to be driven by biological variants that are personal. As Paul Franks explains, continued emphasis on discovering biomarkers that determine individual responses to lifestyle factors will probably lead to the design of robust lifestyle interventions that are more personalized and more effective than today's standard-of-care.

Precision nutrition has emerged as an interesting area of nutrition research, with a particular focus on revealing the individual variability in response to diets that is determined mainly by the complex interactions of dietary factors with the multi-tiered "omics" makeups. The fundamental role of gene–diet interactions in determining the individual variability in health outcomes including obesity and weight loss is proved. Recent investigations suggest that the abundance and diversity of the gut microbiome could modify the dietary effects.

- Many studies suggest that a complicated multiomics algorithm would be developed by incorporating the genome, epigenome, proteome, metablome, and microbiome in predicting the individual variability in response to diets. Precision nutrition would also emphasize the role of biological (circadian) rhythm in determining the individual variability of dietary effects. The evidence gathered from research will be the basis for constructing precision health dietary recommendations, which help individuals and their health care providers create precise and effective diet plans for precision health in the future.
- Three recent studies of diet and exercise provide compelling evidence that an individual's characteristics influence the metabolic response to diet and exercise.
- Harnessing individual-level biological variant data to optimize diets has already proved valuable for the regulation of blood glucose, and may prove of further value for weight change.'
- Researchers derived a machine learning algorithm interrogate complex data structures to predict glycaemic response to each meal based on the data collected in the observational phase, and designed personalized diet interventions. Significant feature of the algorithm was the gut microbiome sequence data

- Montero and Lundby undertook a 6-week exercise intervention, and demonstrated that some participants were highly responsive to exercise, whereas others responded with only small improvements in fitness, yet none of the participants was a true 'non-responder'.

Amongst the vast literature available on the biological basis of individual responses to diet and exercise, there are a few well-conducted trials that provide strong evidence that response predictors are personal, and in some instances quantifiable. Tailoring lifestyle interventions to a person's biological characteristics could help optimize diabetes prevention and treatment.

Studies suggest that the relationship among socioeconomic status, physical activity, and obesity may be modified by genetic variation and interaction.

Transcripts, proteins, and epigenetic marks

The transcription and translation of genetic code can be perturbed by chemical modifications of DNA (broadly termed 'epigenetics') and by extrinsic and intrinsic environmental stimuli. It may be that diet and exercise interact with epigenetic features, such that the physiological consequences of a lifestyle exposure are determined in part by the presence or absence of an epigenetic mark in some cases; in other instances it may be that diet and exercise causes an epigenetic mark to emerge or disappear.

Lifestyle trials for precision medicine also require innovative approaches in design and implementation to overcome the sources of bias and confounding. Recent advances in wearable technologies may help address these longstanding problems.

Harnessing genotypes and other omic variants to optimise lifestyle interventions for population subgroups may significantly impact individual and population scale Diabetes and Obesity trajectories.

These innovative applications could prove valuable when lifestyle medicine is used to prevent or treat type 2-diabetes and obesity.

The pursuance of lifestyle precision medicine in the diabetes and obesity seems rational and let us undertake more research activities in this field.

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