



Editorial

Evidence-based medicine – The case for nutrition



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Diet has been a constant determinant of social, economic and disease across history. One of the transformational eras in diet probably started during the Tudor period (1458–1603). This was a time of great creativity, and one of intellectual, political and religious renovation. This period would also see the discovery and introduction of sugar to the diet (a privilege reserved for the wealthiest), and its use in preserving fruits. Bread, meat, fish, pottages and wine formed the basis of most diets. Although fresh fruits and vegetables were available, it was common for people to avoid eating them uncooked, believing them to carry disease. Indeed, during the plague of 1569 the selling of fresh fruit was banned by law.¹

In modern times, the introduction of evidence-based medicine has been fundamental to improve our understanding of the role of risk factors on disease. It has also been pivotal to enable the scientific and clinical community to establish recommendations and care plans for patients and populations at high risk of disease. Blind randomised controlled trials (RCTs) are usually considered the gold standard in evidence-based medicine. The evidence from such interventions is often used as reference to provide recommendations to patients. In the case of diet, there are several limitations inherent to this exposure, which make evidence-based applications more difficult. RCTs investigating the effect of diet on disease have often used a single nutrient or a combination of them given as supplements. Evidence from such trials has led to important public health recommendations in some cases. For example, large trials on vitamin A supplementation in Nepal² have shown a significant decrease in mortality in vulnerable populations of children. This led to nationwide programmes of supplementation in children, and until adequate and reliable dietary sources of vitamin A can be made accessible to the target populations, the supplementation programmes will offer the safest way to deliver this nutrient. More recently, Public Health England recommends that all those above age 1 year take a vitamin D supplement on a regular basis to counteract the health effects caused by the endemic deficiency observed in the general population. This advice is based on the recommendations of the Scientific Advisory Committee on Nutrition (SACN) following its review of the evidence on vitamin D and health.³

Studies *in vitro* and *in vivo* continue to provide insight into the mechanisms through which diet could modulate disease. Yet,

testing the effects of actual diet (not supplements) in RCTs remains difficult due to several issues such as (a) blinding, (b) sample size calculations, (c) time of follow-up, which can be better addressed in a pragmatic RCT. Blinding is a major methodological limitation as patients can rarely be blinded to what food they are eating, and the intervention might be obvious to the researchers. This issue is particularly relevant when population-based interventions are planned, as biases from both, patient and investigator will occur. To compensate for the lack of blinding, concealment of randomisation is still important, as is blinding the assessor of outcomes.⁴ On the other hand, estimating the sample size needed for a food intervention may not follow the same rationale as that of a pharmacological or drug-related RCT. Finally, diet can be considered a 'chronic exposure' and it is often unclear how long the intervention will need to last until changes in health outcome are measured.

A major challenge remains to improve the adherence of the population to recommendations. The current recommendation of eating five portions of fruits and vegetables a day is being met by less than 15% of adults in the US⁵, and by less than half of the adults in Europe. This, at a time of increasingly robust evidence from observational studies and high quality systematic review, suggesting that diet could modulate the risk of disease. Specific diets (e.g. Mediterranean), natural sources of antioxidants, or foods with anti-inflammatory properties (e.g. vegetables) have all been proposed to reduce the severity and burden of several non-communicable chronic diseases, including neurological, autoimmune, and inflammatory-mediated illnesses. However, as shown by the figures on fruit and vegetable intake, introducing sustained changes in diet, regardless of how small, is difficult.

Evidence-based medicine will continue to represent a major tool to improve the health of the population. In particular, evidence-based nutrition recommendations that can be successfully implemented in the population are urgently needed to tackle the current trends in chronic morbidity. The Porto Biomedical Journal will welcome studies that help to strengthen the evidence on the role of lifestyle-related risk factors for disease.

References

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