

Nutrition – who cares?

Penny Neild

Starvation is one of the world's major concerns because, since the dawn of 'civilisation', individuals have stopped moving around in search of food, gathered together to form populations, and increasingly relied on agriculture. Since that time there have been countless recorded episodes of mass starvation, some induced by man, and many by the elements.¹

In Africa there are marked seasonal variations in the state of nutrition and consequent female fertility, according to the success and timing of the harvest. Survivors may possess a 'thrifty' gene,² which enables carriers to conserve the maximum amount of energy when available, in order to be able to survive and procreate during the lean periods between harvests. A period of 60 generations was probably sufficient to enable such a gene to achieve prominence and influence in the population. Clearly in the twenty-first century, in our sedentary and bounteous western society, such a gene is much more likely to be detrimental than beneficial. Obesity is the biologically predictive outcome of a mismatch between our evolutionary inheritance and the modern ecological niche, which we have, ourselves, engineered.

Professors Jeremy Powell-Tuck and Marinos Elia studied the physiological experience of David Blaine. This well known stunt artist set himself the goal of survival in a Perspex box, suspended near Tower Bridge in London in 2003, for 44 days with no food and only water to drink. Professor Elia was involved with his prior assessment and counseling and monitoring throughout his self-imposed isolation, Professor Powell-Tuck with the supervision of re-feeding at the end of his period of starvation. They gathered huge amounts of data with regard to changes in his levels of macro and micronutrients, hormonal and appetite control factors, both before and after the period of starvation and during re-feeding. The case illustrated some fundamental principles of nutrition, all too often ignored or misunderstood by medical staff at all levels.

- When David Blaine emerged from his box he had a body mass index (BMI) of 21.6kgm⁻² and did not look undernourished despite having lost >25% of his body weight and being significantly deficient in micronutrients. *Changes* in body weight as well as *actual* body weight must be examined in the assessment of undernutrition
- Despite having no specific symptoms of thiamine deficiency, David Blaine showed evidence of

marked biochemical deficiency of thiamine after his fast. It is necessary to replace thiamine before carbohydrate in such situations, in order to minimise the risk of Wernicke-Korsakoff syndrome

- David Blaine had a serum albumin level of 52.9gdl⁻¹ when he emerged from his box. During re-feeding this progressively fell, but remained within the normal range for the majority of this period. This, along with many other examples of monitored starvation, reinforces the fact that albumin is not a useful marker for undernutrition, and in cases of simple starvation is often normal
- Re-feeding has to be undertaken with caution, initially in small amounts with micronutrients and daily monitoring and repletion of phosphate, potassium and magnesium.

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Conference programme

■ Starvation in history

Professor Andrew Prentice, London School of Hygiene and Tropical Medicine

■ Self-imposed starvation and stardom

Professor Jeremy Powell-Tuck, Bartholomew's and The London Queen Mary's School of Medicine and Dentistry, Professor Marinos Elia, Institute of Human Nutrition, Southampton

■ Genes and obesity – future treatment – future cure?

Dr Sadaf Farooqi, Addenbrooke's Hospital, Cambridge

■ Surgical treatment of obesity – why the restriction?

Professor John Baxter, University of Wales Swansea

■ Obesity: clinical need and justice in health care – the ethical dilemma

Professor Len Doyal, Bartholomew's and The London Queen Mary's School of Medicine and Dentistry

■ Tackling obesity: policy making in a complex environment

Dr Fiona Adshead, Deputy Chief Medical Officer, Department of Health

■ Why are doctors so poor in recognising and treating malnutrition in the 21st century?

Dr Rodney Burnham, Oldchurch Hospital, Romford, Professor Peter Kopelman, Bartholomew's and The London Queen Mary's School of Medicine and Dentistry

■ The case for exercise – lessons from extremes

Dr Mike Stroud, Institute of Human Nutrition, Southampton

Between 40 and 70% of our body weight is determined by genetic factors. An increasing number of defects have been found, each with their own characteristic phenotypic features and other associated abnormalities. Currently, genetic control of the leptin-melanocortin system is a particularly fruitful area of research and mutations in the melanocortin 4 receptor (MC4R) may represent the commonest monogenic human obesity syndrome, with a prevalence of 0.5–1% of all obese people.³ It is likely that heterozygotes for such genetic defects will be even more common and may represent less marked syndromic features in association with their obesity. Clearly, the identification of specific hormonal and biochemical imbalances offers potentially useful information in the development of drug targets in the treatment of obesity.

Surgery

Obesity can be treated by a range of bariatric operations, including restrictive, malabsorptive and mixed procedures. Success of such surgery may be due, not only to anatomical changes, but also at least in part to alterations in appetite and satiety induced by neurological feedback mechanisms and reduced secretion of factors such as ghrelin. Interestingly, despite the increasing safety and reduced invasiveness of such procedures (many of which are now being undertaken laparoscopically), as well as the recent guidelines published by the National Institute of Clinical Excellence (NICE), advocating more bariatric surgery, there are ever fewer surgeons in UK undertaking such work. Reasons given for the lack of such surgery include lack of resources and absence of referrals. Are obese individuals judged to be undeserving of medical time and resources? Access to NHS treatment should be based on clinical need alone.

Policy

The Government has problems in making policy related to nutrition and obesity in a society where extreme views and influences prevail. During an exercise in which 153,000 individuals expressed their views on what they considered important in 'choosing health', common responses included the desire for less promotion of unhealthy food to children, better school meals and improved food-labelling. The need for improved access to fitness facilities and encouragement of more physical activity, particularly in the younger age groups, was also cited as important.

The Government's approach to the increasing problem of obesity is 'twin track', incorporating both prevention and management. The latter is to be tackled by means of diet, exercise and behavioural strategies, particularly at the school level. Prescription of anti-obesity drugs has trebled since the publication of the NICE guidelines on management of obesity in 2001, and resources for surgical and behavioural management of obesity are currently inadequate, with only 10 specialist obesity clinics for adults throughout England and seven for children. Only 200 anti-obesity operations are performed annually in the whole of the UK.

Doctors are poor in the recognition and treatment of malnutrition in the twenty-first century. Lack of prominence of nutrition in the training curricula of medical undergraduates is a possible reason, as well as lack of role models for junior doctors once qualified; according to a survey undertaken by the College, published in 2004, only nine out of 8,000 (0.1%) consultants reported a timetabled commitment to nutrition. Until the issue of nutrition in hospital becomes a Governmental target, the situation is unlikely to materially change, due to lack of resources and incentives.

Exercise

Exercise is important in the prevention of obesity. As running mate of Sir Rannulph Fiennes, Dr Mike Stroud has recently completed seven marathons in seven days in different continents, as well as a large number of other extreme physical challenges in adverse conditions. He burned more than 10,000 calories per day in his 80-day antarctic walk, with the unsurprising loss of >20kg.

A sustained increase in daily expenditure, even if relatively small, will have a cumulative effect on weight and general fitness over time, but most people want quick results and therefore dismiss this as an unattractive or non-achievable strategy. The relative risk of cardiovascular death was significantly increased in lean and inactive people compared with obese and active people.

So where do we go from here? Despite a clear interest by the general public in nutritional issues, particularly in relation to children, much of the medical and allied professions have yet to recognise, let alone embrace, the ever-increasing challenge of malnutrition in our society.

References

- 1 Keys AJ, Brozek J, Henschel O, Michelson O, Taylor HL. *The biology of human starvation*. Minnesota: University of Minnesota Press, 1950.
- 2 Neel JV. Diabetes Mellitus: a 'thrifty' genotype rendered detrimental by 'progress'. *Am J Hum Genet* 1962;14:353–62.
- 3 Farooqi IS, Keogh JM, Yeo GS, Lank EJ *et al*. Clinical spectrum of obesity and mutations in the melanocortin 4 receptor gene. *N Engl J Med* 2003;348:1085–95.
- 4 Soonwallah Z, De M, Ganeshar A, Baxter J. Obesity surgery in the United Kingdom: a survey of the attitudes of surgeons and their practices. *Gastroenterology Today* 2004;14:38–44.