EDITORIAL

A GOOD DIET MEANS LESS MEDICINE – BUT IS THAT ENOUGH?

Phillip Evans, Sadia Fatima*

Department of Didactics and Medical Simulation, Medical University of Lublin-Poland, *IBMS, Khyber Medical University Peshawar-Pakistan

Nutrition and diet is, without doubt, of international importance in the health of the world's people[1], but what has this to do with medicine and medical education? The answer is "a great deal" and there is wide recognition of this[2]. The reasons why the status of nutrition should be elevated to a significant theme in both undergraduate[3] and continuing medical education[3] is because the medical profession has to understand more about the basic science and be vigilant about the influence of vested interests and commercial pressures.

Whilst the basic science themes in medical education are taught with academic rigour, the application of science in health-care tends to focus on cutting edge research issues that detract from the basic principles required for good health. Undergraduates are inculcated into a mind-set of high-order research that may eclipse "low-order" aspects of everyday body maintenance and repair, and this is often continued for the lifetime of a clinicians practice. There are several examples of this that includes, vitamin C, water, salt and fasting, all of which are considered "low-tech".

Research about Vitamin C is associated with twice Nobel Laureate, Linus Pauling. The benefits of vitamin C in health and disease are established.[4,5] Studies have shown that fruits and vegetables rich in vitamin C are not only associated with lower risk of cardiovascular diseases, stroke and cancer but also increases life expectancy.[6] Moreover, vitamin C also plays an important role in fighting against mycobacterium tuberculosis, and low serum vitamin C level is associated with the progression of Tuberculosis.[7,8] However, it is not widely prescribed by physicians of western medicine, with the exception of treatment for scurvy.

Though the importance of water in human biology and public health is widely understood, there are claims that the therapeutic benefits of water are not given sufficient recognition.[9] Dehydration is linked to dyspepsia, arthritis, stress and depression. Individuals often do not drink enough water, and how many people know that the recommendation is between 2 and 3 litres per day? How many individuals actually drink that amount? How many doctors explain this to their patients?

There is no disagreement that sodium is essential, and that salt (sodium chloride) is an essential source of sodium, and people do like to use it.[9] This has been the case through history, and the word "salary" derives from the amount of salt that was given as payment. It is almost impossible to have too much salt, as a high salt intake can cause high blood volume, which leads to a hormone release that causes excretion. However, recent trends in lifestyle have called for a "low salt-no salt" diet as a means to reduce blood pressure, and this continues even though studies have shown that a low salt diet in healthy individuals is associated with increase insulin resistance.[10] The advice is contrary to normal physiological processes.

The issue of vested interest is significant and can be illustrated by reference to the treatment for type-2 diabetes, which includes statins and ACE inhibitors, together with a medication that supports insulin action. Though medication is beneficial (and maybe essential) in the short term to stabilise the patient. However, the basic science indicates that the cause lies in the diet and other life-style choices. Patients can reverse their metabolic problem through a low-carbohydrate diet, regular moderate exercise and weekly fasting.[11] However, most patients are given repeat prescriptions for the medications for the rest of their life, and appropriate lifestyle choices about the cause not given. This pharmacological inertia is probably a result of vested interest, by pharmaceutical companies in promoting products, such as statins, and clinicians conveniently ignoring the evidence of the basic science. It is on record that Professors of Medicine have rigorously promoted statins through vested interest.[12] Critics of statins[13,14] point out that they cause diabetes, and do not increase the life expectancy of the patient by one further day. The evidence to use statins as a prophylactic has to be questioned, and, indeed the evidence about a great deal of clinical research has to be read with caution.

"It is simply no longer possible to believe much of the clinical research that is published, or to rely on the judgment of trusted physicians or authoritative medical guidelines. I take no pleasure in this conclusion, which I reached slowly and reluctantly over my two decades as an editor of The New England Journal of Medicine." [15]

When the western world is facing an epidemic of obesity, at a time when the world's poor are starving or severely under-nourish, the notion of a good diet has a variable definition. The true cost of obesity is impaired quality of life, and reduced life

expectancy. The financial cost to the UK's National Health Service was £16.1bn between 2014 and 2015. Obesity is a description of a health issue that is not necessarily caused by over-eating.[16]

However, excessive sugar consumption is definitely not part of a good diet and it does lead to serious health issues. It is also the case that the power of vested interest from the food industry is promoting sugar as successfully as the tobacco industry promotes cigarettes. There are 141 kcals in 330 mls of Coca Cola and 508 cals in a Big Mac. The items are not unhealthy in themselves, however successful marketing has made them easily available, and desirable, to the point where they are a major part of a basic diet for many people in the western world, which is unhealthy. Most fast food is rich in processed carbohydrates (pizza, bread, pasta, potatoes) and sugar (including carbonated drinks and alcohol) and this is associated with an obesity epidemic and the rise in type-2 diabetes. But to what extent is it the cause?[17]

A popular response to controlling weight is to diet. But what does that mean? Within the last 20 years there have been a series of commercially popular diet-types, including the Atkins diet, the F-plan diet, the Ornish diet, the Mediterranean diet, the Paleo diet, and the Keto diet to name a few. Similarly, the treatment of under-nutrition with the recommended high energy nutritional supplements (HENSD) creates a positive energy balance. Studies have documented that the hypercaloric diet with a dietary energy surplus of 2.91±0.32 MJ not only increases plasma insulin levels[18], but the excess carbohydrate intake, mainly fructose,[19-20] also increases VLDL-TAG concentrations. Moreover, excess fat intake decreases the VLDL-TAG concentrations[21,22]. Whilst the intention is worthy, they are a sign that society has no understanding of its' dietary needs, and that the medical profession has lost an opportunity to educate society in what a good diet should be

In addition to diet, knowledge about the gut micro-biome must be included in medical education.[23] The role of microbes, both positive and negative effects, are well understood, but scarcely covered in most medical courses. Considering that there are 3.3 million non-redundant microbial genes in the gut microflora[24], this is a significant omission.

The solution to the nutrition crisis has to be a multi-agency approach, including government legislation, to promote individual responsibility and understanding about what to eat. However, governments legislate according to the advice of professional groups, and in this respect, medicine must take a lead. The WHO and the medical profession is the only group with sufficient global influence that does not have a direct commercial vested interest.

In order to establish a critical mass of authority, medical schools should appoint a chair, or senior lecturer in clinical nutrition with an interest in "non-commercial" treatments. The undergraduate curriculum should include a significant theme or course about nutrition, healthy diets and the relationship between food, health and treatment. This should occur as a specific module or theme called "clinical nutrition" and reinforced in every clinical specialty. In addition to formal teaching, questions about clinical nutrition should be included in assessments as part of the basic science and clinical science examination.

The relevant professional bodies should produce policy documents and lobby their politicians. But more important, clinicians should promote the principles of a healthy diet, which includes advice on avoiding sugar and processed carbohydrates and eating fresh produce. In the UK, the Academy of Royal Colleges has taken a lead by introducing "Choosing wisely".[25] This is a global initiative intended to strengthen patient education, and reduce unnecessary clinical interventions.

The medical communities in developing nations should be supported in this endeavour. However, the developing nations are in a double jeopardy situation. On one side, there is tendency to follow the developed countries blindly without any local data and confirmation of the studies in their local population and on the other side poverty and poor health systems make the general population predisposed to more deleterious effects of the improper diet. It is imperative for the developing countries to promote general awareness about good dietary practices. Awareness programmes should focus on health education from school level onwards. Social and local authorities should be supported in disseminating the knowledge of nutrition and health in under-educated areas at grass roots level. It is also essential to validate the studies conducted in developed countries to the local settings. The associated health-care professionals who are the front line of care in the developing areas must also have Human Nutrition as a key subject in their undergraduate and post-graduate training.

The key messages are that a good diet is essential for good health, and that a bad diet will do us harm. Prescribing an appropriate diet should be seen as an essential part of patient care. Medical schools should integrate diet and Human Nutrition into their basic and clinical science courses as a central part of both undergraduate and continuing medical education to ensure that patients understand how to use diet for self-care. Universities must

continue to gather the evidence necessary to inform government policy, the food industry, society and individuals about nutrition and diet, and health-care professionals must have up-to-date information about best-evidence-based advice to patients. This will improve health and reduce the costs of medication.

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Address for Correspondence:

Dr Sadia Fatima PhD. Assistant Professor IBMS, Khyber Medical University Peshawar-Pakistan
Email: drsadiafatima@gmail.com