

Nutrition—the new medicine

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Medicine today focuses on suppressing the symptoms of disease. A truly preventive medicine, capable of tackling degenerative diseases like arthritis and Alzheimer's, will be based on diet supplements, not drugs. Drug companies don't like it

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Throughout human history the leading causes of death have been infection and trauma. Modern medicine has scored significant victories against both, and the major causes of ill health and death are now the chronic degenerative diseases, such as coronary artery disease, arthritis, osteoporosis, Alzheimer's, macular degeneration, cataract and cancer.

Five out of six people in their sixties in Britain have one or more of these diseases. Drugs can alleviate symptoms, but they do little to alter the underlying disease, which usually continues to deteriorate. Based on the idea of the "magic bullet," developed in the 19th century by the founders of pharmacology such as Robert Koch and Paul Ehrlich, most drugs are designed to block a single step in the complex process leading to the symptoms of illness; a strategy which rarely cures, and is often associated with unpleasant side-effects.

Modern medicine is generally practised as crisis management: wait until the diagnosis, then start treatment. But by the time symptoms of these diseases appear, damage has already been done to the body that drugs cannot address. The chronic degenerative diseases-like coronary artery disease and Alzheimer's-have a long latency period before symptoms appear and a diagnosis is made. It follows that the majority of apparently healthy people are pre-ill. In their bodies are the seeds of the illness which will one day become overt and perhaps kill them. An artery is furring, bone is thinning, brain cells are dying; leading eventually, inevitably, to a heart attack, osteoporotic fracture, or dementia.

But are these conditions inevitably degenerative? A truly preventive medicine that focused on the pre-ill, analysing the metabolic errors which lead to clinical illness, might be able to correct them before the first symptom.

Genetic risk factors are known for all the chronic degenerative diseases, and are important to the individuals who possess them. At the population level, however, migration studies confirm that these illnesses are linked for the most part to lifestyle factors—exercise, smoking and nutrition. Nutrition is the easiest of these to change, and the most versatile tool for affecting the metabolic changes needed to tilt the balance away from disease (a point made by the recent WHO report, "Diet, Nutrition and the Prevention of Chronic Diseases").

All biological tissues are dynamic. Their apparent constancy disguises a state of flux, with the processes of decay and regeneration running in parallel. Bones are constantly being worn away and rebuilt, as are joints. Atheroma is constantly accumulating inside the arteries, and just as constantly being removed. If the anabolic and catabolic processes are in balance, tissue remains intact and good health is sustained. But if the rate of decay is only a little faster than the rate of repair, there is a net loss of healthy tissue, a pre-illness growing every day until clinical illness finally emerges. In many cases, this may be due to multiple micronutrient depletion.

Many national surveys (the biggest of which is the US department of agriculture continuing survey of food intakes) reveal that malnutrition is common in developed countries. This is not the calorie and/or micronutrient deficiency associated with developing nations ("Type A malnutrition"); but multiple micronutrient depletion, usually combined with calorific balance or excess ("Type B malnutrition"). The US survey measured intakes of classical micronutrients in terms of the RDA (recommended dietary allowances) values designed to prevent deficiency diseases. The incidence and severity of Type B malnutrition is worsened if newer micronutrient groups are included, such as the essential fatty acids, various fibre types, xanthophylls, flavonoids and so on. Commonly ingested levels of these micronutrients seem to be far too low in many developed countries.

The prevalence of multiple micronutrient depletion is due to several factors:

- We were designed to live active lives, and to consume 3,000-4,000 calories per day. Now no longer hunter-gatherers, we live sedentary lives and require fewer calories. Our appetites have shrunk (but not quite enough, which explains why so many are overweight). When we eat less, we consume fewer micronutrients.
- Most processed food is depleted in micronutrients, and more processed food is being consumed than ever before. British consumption of fresh green vegetables declined 7 per cent in 2001-02, according to the annual expenditure and food survey.
- Many soils are low in key minerals, or have become depleted due to overintensive farming. Plants or animals raised in these areas are also depleted in these minerals—this is why British intakes of selenium are so low.
- Smoking, sunbathing, pollution and excess alcohol all deplete the body of antioxidants.
- We become progressively more depleted in micronutrients as we age.

DIET SUPPLEMENTS RATHER THAN DRUGS

There is now considerable evidence spelt out in reports from the WHO and other bodies that Type B malnutrition is a major cause of chronic degenerative diseases. If this is the case, then it is logical to treat such diseases not with drugs but with multiple micronutrient repletion, or "pharmaco-nutrition." This can take the form of pills and capsules—"nutraceuticals," or food formats known as "functional foods." This approach has been neglected hitherto because it is relatively unprofitable for

drug companies—the products are hard to patent—and it is a strategy which does not sit easily with modern medical interventionism.

Over the last 100 years, the drug industry has invested huge sums in developing a range of subtle and powerful drugs to treat the many diseases we are subject to. Medical training is couched in pharmaceutical terms and this approach has provided us with an exceptional range of therapeutic tools in the treatment of disease and in acute medical emergencies.

However, the pharmaceutical model has also created an unhealthy dependency culture, in which relatively few of us accept responsibility for maintaining our own health. Instead, we have handed over this responsibility to health professionals who know very little about health maintenance, or disease prevention. They are only taught how to manage disease, or rather the very late stages of disease, when it becomes symptomatic. An analogy might be with car mechanics who know nothing of maintenance, because they have only been taught how to carry out crash repairs.

We have many palliative drugs, and many ways of suppressing the symptoms of illness, but hardly any cures. When the pharmaceutical industry was founded on the "magic bullets" of Koch and Ehrlich, it started in the wrong place. It should have followed Pasteur who, towards the end of his career, came to the realisation that le terrain (our internal physiology) was all-important. And le terrain is in worse shape than ever, due to the increasing prevalence of Type B malnutrition.

WHAT IS THE EVIDENCE?

One problem for supporters of this argument is lack of the right kind of hard evidence. We have a wealth of epidemiological data linking dietary factors to health profiles/disease risks, and a great deal of information on mechanism: how food factors interact with our biochemistry. But almost all intervention studies with micronutrients, with the notable exception of the omega 3 fatty acids, have so far produced conflicting or negative results. In other words, our science appears to have no predictive value. Does this invalidate the science? Or are we simply asking the wrong questions?

Based on pharmaceutical thinking, most intervention studies have attempted to measure the impact of a single micronutrient on the incidence of disease. The classical approach says that if you give a compound formula to test subjects and obtain positive results, you cannot know which ingredient is exerting the benefit, so you must test each ingredient individually. But in the field of nutrition, this does not work. It is like the mechanic who, confronted with a chronically under-maintained car, insists on a test drive after changing the oil filter; another after replacing one of the spark plugs-and so on.

Each intervention on its own will hardly make enough difference to be measured. To make the car run noticeably better and last longer requires a comprehensive service. Similarly, to enable humans to live healthier and longer lives, comprehensive nutritional support is required. For example, in coronary artery disease it is clear that there is no single weak link. Rather, western diet and lifestyle can push haemochemistry and vascular physiology into multiple pathologies. The best therapeutic response must therefore combine micronutrients to normalise the terrain

(this is the basis of the pharmaco-nutrition courses currently taught at the Royal College of GPs).

So do we need to analyse each individual's nutritional status and then tailor a formula specifically for him or her? After all, different people have different lifestyles, and eat different foods. One person may be depleted in vitamin E, methyl groups and omega 3 oils, another in vitamin C, B12, copper and selenium. A third might be consuming suboptimal amounts of isoflavones and lycopene.

While we do not have the resources to analyse millions of individual cases, there is no need to do so. The vast majority of people are consuming suboptimal amounts of most micronutrients, and most of the micronutrients concerned are very safe. Accordingly, a comprehensive and universal programme of micronutrient support is probably the most cost-effective and safest way of improving the general health of the nation.

THE OBSTACLES TO PHARMACO-NUTRITION

One should not fall into the trap of seeking to replace one "magic bullet" with another. Nevertheless, pharmaco-nutritional programmes are poised to do for the degenerative diseases what antibiotics did for the infectious illnesses, and the potential healthcare cost savings are enormous. The social implications of the prospective changes in public morbidity and mortality, which may represent as many as 25 additional years of healthy middle and old age, will be even more significant.

The emerging science base has already generated pharmaco-nutritional programmes to treat many of the most serious diseases. And almost every clinical scientist in the micronutrient field is calling for increased intakes of lycopene, resistant starch, fish oils and so on.

There are, however, obstacles. The pharmaceutical industry remains sceptical—and for good reason. In Finland, simple dietary changes which halved heart attacks and strokes during the 1980s and 1990s led to significantly reduced drug sales. British GPs who attended a pioneering course in nutritional therapy at the University of Surrey reported up to 30 per cent savings in prescription costs. Such trends, if duplicated in national markets, would be bad news for drug companies

The recent EU food supplements directive, soon to be incorporated into British law, appears to show the influence of drug company arguments. It will certainly damage the nascent pharmaco-nutritional business by imposing levels of nutrients in supplements based, arbitrarily, on "RDA" values. Recent media scare stories about certain vitamins and green tea have helped to push consumer groups into the anti-supplement camp.

There are certainly problems with the existing supplements business, which is worth almost £400m a year. Most over the counter supplements are not well designed and most consumers do not take them regularly enough or for long enough to see any effect. None of this, however, justifies the attack on the supplements and vitamins industry by the government's food standards agency, which attracted wide media attention in early May.

The pharmaceutical industry's opposition to the nascent science of pharmaco-nutrition was one factor behind this attack. Contrary to the press reports which blamed the drug companies for vitamin pill "quackery" most of them have little interest in moving into pharmaco-nutrition because the economic returns are much lower than for patentable drugs.

None the less, there are some forces on the side of pharmaco-nutrition. These include the manufacturers of the functional foods now making major contributions to Japanese and Finnish public health. It could also come to include some far-sighted politicians who grasp that the next wave of healthcare will be food, and the point of delivery will shift from the pharmacy to the supermarket checkout.

Percentage of Americans depleted in vitamins

Vitamin %

C 37

E 68

A 55

B1 32

B2 31

Niacin 27

Folate 34

B6 54

B12 17

Source: US department of agriculture, 1997