



# DR PAUL CLAYTON'S

## Health Newsletter



Winter 2009

Public health disgrace

Regulators

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Selenium

### Public health or public disgrace?

Ignore the Department of Health's latest Pollyanna 'achievements', dismiss the Health Minister's gibberish and spin; the political junk mail we get from these sources is no more trustworthy than a politician's expense claim. The sad fact is that I would settle, at this jaundiced, mid-life stage of my career, for politicians who were corrupt but at least competent. Unfortunately, the political class that we must, at some level, deserve, is both corrupt and incompetent. Evidence for this is everywhere, but nowhere is it more evident than in our appalling public health statistics.

Public health is in real decline. You wouldn't know this if all you had to go on was the manure regularly shovelled over our heads by the government and the media, but the reality is that in almost every respect, and every day, things are getting worse and worse.

For example ... did you know that comical old disease **scurvy** is making a comeback? Following a recent parliamentary question from conservative health spokesman Stephen O'Brien, it was grudgingly revealed that the number of children admitted to hospital with scurvy increased from 61 in 2004/5, to 94 in 2007/8. Because the figures cover only those admitted to hospital with diagnosed scurvy, the total number of cases is likely to be much higher.

The charmingly antique illness **ricketts** is on the rise too, especially in dark-skinned folk, who need more exposure to sunlight than the British climate generally provides to make enough vitamin D for their bones (Algrove '04, Robinson et al '06, Times '09). Similar trends have been recorded all across Mid- and Northern Europe (Prentice '08), an unfortunate consequence of uncontrolled population shifts. But this, my friends, is just the tip of the tip of the iceberg; an iceberg which cumulatively represents every major category of disease.

**Infectious diseases** are slowly re-emerging as an important cause of disability and death, due to our clumsy and often indiscriminate use of antibiotics.

In the hospitals, there are uncontrollable problems with '**super-bugs**' (such as methicillin-resistant *Staphylococcus aureus*, or MRSA; *Escherichia coli* and *Klebsiella* species; *Acinetobacter baumannii*; *Aspergillus* fungi; vancomycin-resistant *Enterococcus faecium*, or VRE; and *Pseudomonas aeruginosa*).

Our failure to deal with these problems is making people increasingly reluctant to go into hospital for even minor surgery, and is dragging us back to the dark days before Semmelweis, when childbirth in hospital was tantamount to a death sentence. A well-known microbiology consultant confided to me recently that if he ever needs surgery, he has asked his colleagues to operate on him in the hospital car park which he regards as safer than the operating theatres!

In the community there has been a steady increase, now over half a million new cases world-wide each year, of MDR- and XDR-TB, aka multi-drug-resistant and extensively-drug-resistant strains of **tuberculosis**. Both of these increasingly lethal forms of the infection have taken up home in the UK (Anderson '09, Abubakar et al '09).

**Allergic disorders** such as asthma, allergic dermatitis, rhinitis and conjunctivitis, have increased by between 200 and 300% since 1970 (Upton et al 2000). Less well-known allergic conditions involving the gut (the eosinophilic gastro-intestinal diseases) show an 'explosive' rate of growth (Noel et al '04).

Another group of immunological disorders, the **auto-immune diseases**, are also on the rise. **Type 1 diabetes** in the under-15s is increasing by 3 to 4% year on year (Patterson et al '09);

and all the others (Graves Disease, Rheumatoid Arthritis, MS etc) show a similar pattern (Miller '09).

The **neuro-developmental disorders** (aphasia, dyspraxia, ADD, ADHD etc) are increasing (Robison et al '02), although increased diagnosis is undoubtedly contributing to the overall figures.

**Psychiatric illnesses** are certainly increasing in some groups. The rate of common mental disorders, typically depression and anxiety, has risen by a fifth among middle aged women since 1993 (APM '07); and there has been an 80 per cent increase in self-harm among women aged between 16 and 24 since 2000 (APM '07).

Many of the degenerative diseases are rising in frequency, and emerging in progressively younger age groups.

**Type 2 diabetes** (formerly known as adult-onset diabetes) is becoming common in teenagers. **Age-related macular degeneration**, an important cause of loss of vision, appears to be showing a similarly worrying trend (ie Yong et al '06); as is **osteoporosis** (Obrant et al '89).

**Hypertension** and pre-clinical hypertension now affect over 50% of all American adults (USDA website), and Britain is not far behind.

With regard to **cancer** and **heart disease**, the figures are truly dreadful. Both of these conditions have increased almost ten-fold since the mid-Victorian era, ie at a time when life expectancy matched our own (Clayton & Rowbotham '09).

The picture I have sketched above is unremittingly gloomy, and hard to reconcile with the sunlit upland vision of our leaders.

You have heard, I am sure, of the continuing increase in life expectancy that has occurred since 1900: so how could we all be getting sicker when the experts tell us we are living longer, and when the number of centenarians has never been higher?

## But what about all those 100-year-olds?

The truth is that we only have more centenarians because our population is larger, and the recorded increase in life expectancy is almost all due to reduced infant mortality. There has been little gain in life expectancy for the middle-aged, and as all the disease categories increase in frequency our life expectancy can only fall. Indeed, the fallback has almost certainly already begun.

What lies behind the increase in so many disease categories? How have we created such an unhealthy environment?

The answer is not heavy metals, pesticides or some other mystery pollutant. None of these could cause such a generalised increase in so many different disease categories. Type B malnutrition (multiple micronutrient depletion) however, can; and thanks to our low energy

lifestyles, and poor food choices, most people today are depleted in most micro- and phyto-nutrient categories.

I started the list of modern woes with scurvy and rickets, two diseases linked to malnutrition and poor living standards – but in fact ALL the diseases listed above have major nutritional components. Most doctors have been brainwashed into thinking that pharmacology is the key to health, and that pharmaceutical pharmacology is the only kind of pharmacology that matters.

What they are not taught in medical school is that the most effective keys to health are derived from the **pharmacological properties of food**. They sit at their desks prescribing drugs that alleviate symptoms but cure nothing; while an ever-rising tide of illness floods twice daily into their surgeries. How many of

these King Canutes, I wonder, have seen or read Ibsen's masterpiece 'An Enemy of the People'? Which latter-day Jon Snow will remove the handle from the pump at the supermarket check-out that dispenses so much of today's burden of disease?

The breadth and complexity of these issues is such that doctors alone cannot effect the changes needed to create a healthier society. For that we need enlightened politicians, social engineers willing to make unpopular but necessary decisions. Regrettably, too many of the current crop of parliamentary knaves and fools appear to be too deep in the pockets of the oil and pharma industries to do anything about this. The sad result is that every day has become a good day to bury bad news; together with the victims of unnecessary and avoidable disease.

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## Regulators on Fire

The savants in Brussels who staff EFSA, the regulatory apparatus that determines what we can and cannot say about our foods, have done it again. They have denied a proposed claim, submitted by a UK company, that their proprietary blend of lycopene and whey protein could improve arterial health; despite the fact that the company submitted a dossier containing 80 studies including six intervention studies, 22 observational studies, 44 other human studies and eight reviews.

I am sitting on the fence on this one. The regulators are largely discredited, ever since it became clear earlier this year that key decisions were being made on political, rather than scientific grounds. But companies consistently get it wrong, too. The problem is that they, like the drug giants, exist in a mixed economy. They must sell product to survive, and they must differentiate their product in order to sell it. The sad truth, however, is that arterial health and cardiovascular disease is too complex to be solved by any single intervention; whether it is a drug (such as the much-hyped but singularly ineffective statins), or an overly simplified nutritional approach.

There is plenty of evidence that lycopene reduces the

oxidation of lipids in the bloodstream (ie Hsu et al '08). Unfortunately, taking lycopene will not protect you against the lipid and cholesterol oxidation products that are formed in foods during storage or certain cooking processes (ie Fujioka and Shibamoto '04, Saldanha and Bragagnolo '07), and which we are consuming in ever-increasing amounts (Savage et al '02). When you ingest these they are just as harmful to the lining of your arteries as the oxidation products that form in the blood if you smoke or eat too few antioxidants.

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The Paul Clayton Newsletter describes developments in the new field of pharmaco-nutrition, where nature and science are combined to offer non-drug solutions to degenerative disease.

The Newsletters are intended to increase knowledge and awareness of health issues and are for information only.

No health claims for specific products are made or intended and the information should not be used as a substitute for medical advice.

To be fair, tomatoes and tomato products do have other heart-healthy properties. They reduce platelet stickiness (Hsiao et al '05, O'Kennedy et al '06), a claim that EFSA actually does recognise; and they inhibit the migration of white blood cells into the arterial lining (Hung et al '08), thereby reducing arterial inflammation. On balance, therefore, regular consumption of tomatoes and tomato products should indeed reduce the risk of heart disease – but they are not a panacea.

The reality is that if we wanted to really reduce the burden of heart disease (and cancer) we would ban tobacco and deep-fried foods, and double the price of petrol. Then we would remove all central subsidies from meat, sugar and dairy products, and shift them over to fruit and vegetable production. Radical socio-engineering of this kind would quickly lead to a leaner, healthier population and dramatically lowered health care costs; a happy state last recorded during the late 19th century. But of course it won't happen. There are too many vested interests such as Big Pharma, Big Oil, Little Tobacco and Ineffective Government ...

In the meantime, we must do what we can to improve our

## Blind Faith

While on the vexed subject of food regulations, it is worth reviewing the decision by our very own Food Standards Agency to stop the small British company Nature's Best from claiming that their high-dose lutein supplement, Eyewise, could 'protect the eyes.' This, said the FSA, could deceive consumers into thinking that Eyewise could protect against age-related macular degeneration (ARMD), an important cause of the loss of sight in old age.

"We ... had not seen evidence that demonstrated that the lutein in Eyewise was bio-available and would protect eye health, and because of that we concluded that the claim was misleading," the FSA said in its judgement. In my view the FSA's comment on bio-availability is a reasonable one, and easy to resolve; but the second half of their rebuttal is more serious. Does the dietary carotenoid lutein protect the eyes, or does it not?

Lutein is undoubtedly important for the health and function of the retina, and low lutein levels in the diet are linked to both impaired retinal function and to an increased risk of ARMD (ie Carpentier et al '09). Lutein is not, however, the only carotenoid in the retina. It co-exists with two other carotenoids, zeaxanthin and meso-zeaxanthin, and there is evidence that consuming high levels of one carotenoid can impair the ability of the body to absorb the others (ie Thurnham '07, Thurnham et al '08). Conversely, there is evidence that the retina can convert one carotenoid into another, presumably according to its needs (ie Khachik et al '02); so maybe lutein alone is enough after all.

There is a good case for high dose supplements, because dietary improvement alone is probably insufficient to achieve the desired improvements in retinal structure and function (Moeller et al '09). But I still have nagging doubts ... because there is more to the retina than lutein, or even the carotenoids as a group.

The retina is a complex organ and its maintenance requires a large number of trace elements and vitamins, as well as the carotenoids and flavonoids. Given that today's lifestyles commonly run at just over 2000 calories per day, and with so many people making poor food choices, most of us are depleted in most micro- and phyto-nutrients.

That includes the essential fatty acids, and especially the

own health prospects. Once the basics are in place (the usual suspects including no smoking, exercise, healthy diet), a comprehensive micro- and phyto-nutrient support programme is the logical next step for anyone expending and consuming less than 3000 calories a day ie. 95% of us.

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long chain omega 3s derived from fish oil. These fatty acids are essential for cell membrane function, and there is a good deal of evidence that they also play a key role in retinal health (ie Sangiovani and Chew '05). This means that any eye supplement should include a good quality fish oil, and is a serious argument against simple carotenoid products.



Finally, a fascinating new paper by an Irish group at the Waterford Institute of Technology (Nolan et al '09) shows that there is more than one way to protect the eye. The retina is vulnerable to oxidative damage caused by light, with the most damaging wavelengths in the visible spectrum being the shortest ones ie. blue light. The carotenoids protect the retina by absorbing blue light, which they do very well; but they themselves are destroyed in the process and must be replaced if the retina is to be preserved.

If you could prevent blue light entering the eye, the Irish reasoned, the carotenoids would not be destroyed and the retina would be protected. Their preliminary findings using coloured lenses showed just that. Sunglasses may maintain your mystique, but sunglasses that filter out blue light will probably maintain your vision too.

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## The wrong form of selenium?

Supplement companies were dismayed by a recent FDA verdict that selenium supplements do not protect against prostate cancer. The FDA's statement read: "Two weak studies suggest that selenium intake may reduce the risk of prostate cancer. However, four stronger studies and three weak studies showed no reduction in risk. Based on these studies, FDA concludes that it is highly unlikely that selenium supplements reduce the risk of prostate cancer."

The evidence that selenium is cancer-protective is actually quite good. It ranges from epidemiology (interesting but weak) to *in vitro* studies (equally interesting and rather stronger), to animal models and clinical trials. Nonetheless, in any meaningful analysis, clinical intervention studies carry the most weight; and here the balance of evidence does not seem to favour selenium. Look under the surface, however, and a different, more complex picture emerges.

There are several forms of selenium found in the diet and used in supplements, and they all have different characteristics. The inorganic selenites and selenates, which are widely used because they are cheap, are not the forms of choice. After ingestion these selenium salts are poorly absorbed, which is just as well as they have a tendency to generate hydrogen sulphide; a gas that is not only cytotoxic but also carcinogenic in its own right.

A better candidate may be selenium yeast, which consists of yeast grown in a selenium-rich environment. Under these conditions yeast cells incorporate the trace element into a range of compounds, among which selenomethionine is the dominant form. Several trials with selenium yeast have shown cancer protection in those subjects who had low selenium levels at baseline (ie Duffield-Lillico et al '02); and these results led directly to the powerful Selenium and Vitamin E Cancer Protection Trial known as SELECT.

This huge multi-centre study was a randomized, placebo-controlled trial of 35,533 men from 427 participating sites in the United States, Canada, and Puerto Rico, and as the scientists involved did not wish to work with anything as messy as selenium yeast, they decided to use pure selenomethionine instead. This did not reduce the risk of prostate cancer (Lippman et al '09). The negative findings of SELECT were used in some quarters to deny that selenium had any protective effects at all, and the FDA agreed.

Unfortunately, selenomethionine was almost certainly the least suitable form of the element to use. Selenomethionine

is well absorbed, but the body cannot distinguish between it and the amino acid methionine, and incorporates it more or less randomly into each and every one of the thousands of proteins the body makes. Much of this is wasted. There are only about 25 genes in the body that code for about the same number of seleno-proteins, proteins that depend on selenium to function properly; but as selenomethionine is farmed out quite indiscriminately, only a very small percentage of it gets to where it is needed. Selenomethionine kills cancer cells *in vitro*, but the fact that it is mis-directed when taken up by the body could explain why the compound has no effect *in vivo*.

One of the world's leading experts in selenium metabolism is Professor Mikael Bjornstedt at the Karolinska, in Stockholm. Professor Bjornstedt was certain that selenomethionine was the wrong choice, and predicted from the outset that SELECT would fail. His preferred candidate was methyl selenocysteine (Me-Se). This is the form of selenium that occurs in onions and leeks, and it has an excellent profile for an anti-cancer compound.

Me-Se is well absorbed. Then, after entering the blood stream, it is metabolised (by selenium-containing enzymes) to form active selenium compounds that selectively kill cancer cells by generating oxidative stress (ie Madeja et al '05, Olm et al '09). Me-Se is present in relatively small amounts in selenium yeast and it looks very much as if, when the SELECT designers opted for selenomethionine, they picked the wrong compound.

More research is needed, and I am aware of some very interesting pre-clinical work that will translate, hopefully next year, into a new clinical trial. Watch this space.

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## Selenium and HIV - evidence from Senegal

Work in China, where selenised salt and fertiliser were used to improve the selenium intake of vulnerable populations demonstrates that improving people's selenium status dramatically reduced the rates of infection with Hepatitis B, Hepatitis C and Coxsackievirus – and HIV.

This is supported by epidemiological evidence from Africa. Here among the countries most ravaged by HIV there is one exception. Senegal has all the risk factors for HIV: polygamy and unprotected promiscuity are widespread (Hecht '97, Meda et al '99). Yet in the capital Dakar the rate of HIV infection among women attending ante-natal clinics has remained at 1% or less. In contrast, some of the surrounding countries have infection rates at 25% and higher.

What's so special about Senegal? Genetic factors may play

an small role, but very importantly, the country has a high selenium status. Senegal is effectively a dried up Cretaceous sea-bed and the rocks contain high levels of selenium, which is taken up by crops and animals that graze there. The population is also relatively immune from cancer (Combs '97, Foster '98, Rayman '00).

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