

The virtues of Vitamin D: It's time we saw the light

There's no such thing as a cure-all, but Vitamin D comes pretty close. Jeremy Laurance explains how a little sunshine could help you live a lot longer

It may not be the first supplement to be called a "wonder vitamin", but it is one of the few to have lived up to the name. Last week, the biggest review of the role of vitamin D in health found that people who took supplements of the vitamin for six years reduced their risk of dying from all causes.

Overall mortality

It was the proof that researchers had been waiting for. Earlier studies had suggested that vitamin D played a key role in protecting against cancer, heart disease and diabetes – conditions that account for 60 to 70 per cent of all deaths in the West. The new study, by scientists from the International Agency for Research on Cancer in Lyon and the European Institute of Oncology in Milan and published in Archives of Internal Medicine, shows that it does. The review of 18 trials involving 57,000 people found that those who took the supplements had an 7 per cent lower risk of death overall during the six-year period of the study.

Edward Giovannucci, a professor of nutrition at the Harvard School of Public Health, said that the research added "a new chapter in the accumulating evidence for the beneficial role of vitamin D on health". He called for a debate on the merits of "moderate sun exposure, food fortification with vitamin D and higher dose supplements for adults".

Vitamin D is important because we are often short of it. Most healthy individuals get all the vitamins and minerals they need from eating a balanced diet, but vitamin D is the exception. It is made by the action of sunlight on the skin, which accounts for 90 per cent of the body's supply. Very little comes from food.

But the increasing use of sunscreens and the decreasing amount of time spent outdoors, especially by children, has contributed to what many scientists believe is an increasing problem of vitamin D deficiency. In the winter, the sun in Britain is barely strong enough to make the vitamin, and by spring, say scientists, 60 per cent of the population is deficient (defined as a blood level below 30ng per millilitre).

Colds and flu

The traditional advice for avoiding these winter ailments has been to swallow large quantities of vitamin C. But we may have been turning to the wrong vitamin. Researchers from Winthrop University Hospital in Mineola, New York, found that giving supplements of vitamin D to a group of volunteers reduced episodes of infection with colds and flu by 70 per cent over three years. All the participants were Afro-Caribbean women whose dark skin means that they make less vitamin D. The researchers said that the vitamin stimulated "innate immunity" to viruses and bacteria. The decline in vitamin D levels between November and March could be the "seasonal stimulus" that accounts for the peak in colds and flu in the winter. "Since there is an epidemic of vitamin D insufficiency in the US, the public health implications of this observation could be great," the researchers wrote.

Heart disease

High rates of heart disease in Scotland have been blamed on the north's weak sunlight and short summers. Differences in sunlight may also explain the higher rates of heart disease in England compared with southern Europe. Some experts believe that the health benefits of life in the Mediterranean may have as much to do with the sun there as with the regional food.

A study of almost 10,000 women over 65 by the University of California found that those who took vitamin D supplements had a 31 per cent lower risk of dying of heart disease; researchers at the University of Bonn found lower levels of vitamin D in patients with chronic heart failure.

Vitamin D works by lowering insulin resistance, which is one of the major factors in heart disease. It is also used by the thyroid gland, which secretes a hormone that regulates the body's levels of calcium, which in turns helps regulate blood pressure.

Cancer

A 40-year review of research found that a daily dose of vitamin D could halve the risk of breast and bowel cancer, two of the biggest cancer killers. Scientists from the University of San Diego reviewed 63 scientific papers published since the 1960s and concluded that there was a need for "public health action" to boost vitamin D levels. They said that a daily dose of 1,000 international units (25 micrograms) was needed; the recommended level in the US is currently only 400 units. Vitamin D deficiency "may account for several thousand premature deaths from colon, breast, ovarian and other cancers annually," they wrote in the American Journal of Public Health.

The research showed that African Americans with darker skins and people living in the north-eastern US, where it is less sunny, were more likely to be deficient in vitamin D, and had higher cancer rates. This could explain why black Americans die sooner than whites from cancer, even after allowing for differences in income and access to health care.

In June, the Canadian Cancer Society recommended that adults start taking vitamin D supplements to reduce their risk of cancer.

Rickets

This is the disease traditionally linked with vitamin D deficiency. A century ago, the typical bow-legged gait of children whose bones had softened and deformed in the absence of the vitamin was a common sight. Cod liver oil, which contains vitamin D, was introduced as a welfare food in 1942 and virtually eliminated the condition. Now, rickets is reappearing. Last June, doctors in Dundee reported five cases in ethnically Asian children; dark skin produces vitamin D more slowly than lighter skin.

Vitamin D is crucial for the absorption of calcium, which is the building material for new bones. As well as leading to rickets, deficiencies can contribute to poor tooth formation, stunted growth and general ill health.

The National Institute for Clinical Excellence is consulting on a proposal to recommend supplements for certain pregnant women at risk: vegans and women who cover their skin for religious reasons. Supplements are already recommended for infants at risk, and are available free to families on income support and jobseeker's allowance.

Diabetes

Vitamin D supplements given to babies born in Finland reduced their risk of Type 1 diabetes by 80 per cent. Researchers followed 12,000 children born in 1966 until 1997 and found that those who developed rickets, indicating vitamin D deficiency, were three times more likely to become diabetic. Vitamin D is believed to act as an immunosuppressive agent, which may prevent an overly aggressive response from the immune system from destroying insulin-producing cells in the pancreas.

In Oxford, the number of five-year-olds with diabetes has increased fivefold, and the number of 15-year-olds with it has doubled. Doctors say that this increase is too steep to be caused by genetic factors, and must be due to changes in the environment. "Our research shows that an alarmingly high number of people in the UK do not get enough vitamin D," said Elina Hypo-ponen, from the Institute of Child Health in London, who led the Finland study. "In winter, nine out of 10 adults have sub-optimal levels."

Multiple sclerosis

The idea that sunlight might protect against MS arose because the condition is more common in countries further from the equator: gloomy Chicago has a higher rate than sunny Florida, for example. Cloudy Scotland has the highest rate of MS in the world. Scots born in May, after the long, dark winter, have an above-average risk, while those born in November, after the summer holidays, have the lowest risk.

Sir Donald Acheson, former UK Chief Medical Officer, published a study in 2004 suggesting that people who spent more time in the sun had a lower risk than those who stayed out of it. Published in the Journal of Epidemiology and Community Health, it concluded that a certain level of exposure to the sun might be necessary throughout the year.

Autism

Could vitamin D deficiency be behind the explosion in autism? John Cannell, a psychiatrist and vitamin D advocate, thinks so. The evidence is circumstantial, but Cannell says that medical advice to avoid the sun and cover up since the 1980s has paralleled the rise in autism. Flagging levels of vitamin D could be the decisive factor. Dr Richard Mills, research director at the National Autistic Society, said: "There has been speculation about autism being more common in high-latitude countries that get less sunlight, and a tie-up with rickets has been suggested – observations which support the theory."

How to get it – and how much you should take

- * 90 per cent of the body's supply of vitamin D is generated by the action of sunlight on the skin.
- * Vitamin D lasts for around 60 days in the body, so it needs regular topping up.
- * Twenty minutes twice a week in the sun with exposed hands, arms and face is adequate to maintain reserves.
- * There is no recommended supplementary dose in the UK.
- * In the US, the recommended supplementary dose is 400 international units a day.
- * Some scientists say that 1,000 international units of vitamin D a day may be necessary to prevent disease.
- * Vitamin D supplements cost around 5p a day.