

An underwater photograph showing a diver swimming through a massive school of small fish. Sunlight rays stream down from the top left corner, illuminating the scene. The water is a deep blue color.

RAY OF LIGHT

There is tantalising evidence that vitamin D may help to prevent childhood diabetes. And with the incidence of the condition on the rise, it is time politicians took action to ensure that more research is urgently undertaken, writes Oliver Gillie

IN 1942 the wartime government, intent on securing the nation's health, decided to provide mothers and infants with free cod liver oil. The decision was based on knowledge that vitamin D in cod liver oil prevents rickets, the disease that causes deformities of bone growth. It was also supported by a folk belief in the virtue of cod liver oil that went back hundreds of years. Even so nobody suspected in those days that cod liver oil could prevent diabetes in children.

Now, new scientific evidence from Scandinavia and other countries suggests that cod liver oil, or vitamin D, prevents diabetes in young people. This type of diabetes, known as diabetes type 1, requires daily injections of insulin to maintain health. It is the commonest chronic disease of childhood other than asthma and a major cause of ill health costing about one per cent of the NHS budget or half a billion pounds per annum in the UK.

The new evidence showing that diabetes type 1 may be prevented by vitamin D comes from three different studies with essentially similar findings. The largest study, undertaken in Oulu and Lapland in northern Finland, investigated diabetes in some 10,000 children. It found that children who took vitamin D supplements in their first year were 10 times less likely to suffer from diabetes later in life than children who took no vitamin D supplement. The Finnish study was undertaken in collaboration with the Institute of Child Health and Imperial College School of Medicine in London and was published in *The Lancet* in 2001 (vol 358, no 3, pp1500-1503).

So why has there been no rush to give vitamin D to mothers and infants in the UK? Probably because the three studies showing the benefits of vitamin D in infancy are all observational studies, and as such are sometimes dismissed as second class scientific evidence. A double blind trial, in which treated and untreated subjects are chosen at random, is generally considered necessary for ultimate proof of the benefits of a dietary supplement, although this type of evidence can be difficult and sometimes impossible to obtain.

In real life we often have to make decisions with incomplete information and so it is with science if we are to obtain the most benefit from the limited information that is often all we have. In this case we not only have three studies that are in substantial agreement on the benefits of vitamin D in preventing diabetes. Animal experiments

have also shown that administration of vitamin D to mice can prevent diabetes.

Vitamin D is made by the action of bright summer sunlight on skin. Diabetes is more often diagnosed in winter when vitamin D is in short supply and it is most frequent in countries such as Scotland and Finland that are furthest north and obtain least sun. These observations are consistent with the three studies of vitamin D supplements and provide the basis for a convincing scientific theory.

Vigorous political action is now needed to ensure that our best understanding of current scientific knowledge is used to direct policy and to ensure that opportunities are not lost. The sad rump of the 1942 government policy on cod liver oil still exists today. Welfare vitamins containing vitamin D are available free to mothers and infants who receive certain categories of benefits. Current policy appears to assume that only poor mothers really need these extra vitamins – whereas deficiency of vitamin D may affect anyone regardless of social class. Mothers who do not qualify for free Welfare vitamins are able to buy them but relatively few do – probably because they pick up the idea that these vitamins are only needed by “poor mothers” who cannot feed their babies properly.

There is an opportunity here to build on this old policy that has withered because its benefits were not fully appreciated. Ideally vitamin D should be provided free – it is cheap to produce and easy to distribute effectively through mother and baby clinics. The investment would repay itself many fold in pure financial terms as well as preventing much human misery. But if free provision of vitamin D is ideologically unacceptable Welfare vitamins which contain D should be energetically promoted so that every mother understands the likely benefits in prevention of disease.

But political action needs to go further and ensure that research is undertaken urgently to extend knowledge of the effects of vitamin D in infancy. A recent article in the *British Medical Journal* (August 9) suggests that vitamin D may also prevent multiple sclerosis. We do not know, for example, what the optimum dose of vitamin D should be for pregnant or breast-feeding mothers and infants. The current recommended dose is based on the amount of vitamin D in a teaspoon of cod liver oil. However this is simply the dose that was settled on 60 years ago as adequate for avoidance of rickets.

The Finnish mothers and infants in the study I have mentioned took a dose of vitamin D that is five times that generally recommended for adults in the UK. It may be that such large doses are necessary for prevention of diabetes. Urgent research is needed to find the most effective dose of vitamin D for mothers and infants.

These issues are urgent because the number of new cases of diabetes per year is rapidly increasing in almost all industrial countries. Between 1973 and 1988, a time when uptake of Welfare vitamins was declining, the incidence of diabetes in children under four doubled in the UK. The move away from free Welfare vitamins is just one factor in this increase, although it may well be a crucial one.

The primary source of vitamin D in most countries is the action of sunlight on skin – very little is obtained from food – and people in industrial countries are getting less sunlight on their skins than they used to. This is because we all spend more time indoors watching tv and travel around more in cars. We also tend to overuse sunscreens and so actively block out the sun. There are many social issues here including, for example, provision of parks and sports fields that enable us to enjoy the sun.

These issues are particularly important for Scotland which has a higher incidence of diabetes type 1 and multiple sclerosis than other parts of the UK. This is not surprising because, as we know, Scotland is in the north of the UK, and over the period of a year Scotland obtains about two thirds of the amount of sunlight obtained in southern England. And even when it is sunny in Scotland it may not be warm enough to remove clothes and obtain the benefit of sun on the skin.

In fact there is an interesting correlation between the average annual temperature of a country and the incidence of diabetes type 1. It is not a perfect correlation. There are exceptions showing that vitamin D is not a unique risk factor for diabetes. However it is the risk factor that we are beginning to understand and one that we have the means to alter – if the political will can be found.

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