Sun exposure may be a good thing

By Judy Foreman, Globe Columnist, 6/4/2002

Remember how good it used to feel, hanging out in the sun, letting your face acquire that nice, ruddy glow?

Then came all those depressing public-health messages telling us that the sun was dangerous, that we should feel guilty about even the slightest tan.

But there's a new ray of hope - dare we say "sunshine?" - in the form of a modest but significant shift in medical thinking toward the view that some unprotected sun exposure may actually be a good thing. Like 15 minutes or so a day in the summer for adult Bostonians who tan well, less for
those who burn easily.

For children, cautioned Dr. Robert Stern, chief of dermatology at Beth Israel Deaconess Medical Center, it's still a sad fact that excessive childhood exposure to sunlight is linked to later basal- and squamous-cell skin cancers, as well as to melanoma, a more serious form of skin cancer. But, Stern said, "it's probably true that for people over 40, even people who have had a non-melanoma skin cancer, we have oversold the idea of having to be sun-phobic. For them, modest exposure has little risk."

And may have some benefits.

The rationale for the some-sun-is-good point of view, supported by a number of recent articles in medical journals, is that the vitamin D made in the skin in response to ultraviolet B radiation may protect against certain diseases, including cancers of the breast, colon and prostate.

Other diseases, most notably multiple sclerosis, also show a "latitude effect," that is, they are less-prevalent among people in sunnier climes. As with cancer, however, it's far from proved whether these differences in disease have to do with vitamin D or to some other factor that varies by regio n such as diet, behavior or genetics.

Maps showing cancer rates across the United States offer some - albeit imperfect - evidence to support the sunshine theory. For instance, if you look at colon cancer rates for white men and women, or breast cancer for white women, you'll see higher rates in the less-sunny northern areas, particularly in the Northeast. Prostate cancer rates for white men are also higher in the northern states, though high rates can also be found in pockets of the South. For blacks, rates for some of these cancers are also higher in the North, though the sunshine effect is less pronounced.

Sunlight may also be an effective treatment for diseases. In a recent study published in the journal Lancet, Dr. Michael F. Holick, an endocrinologist and leading vitamin D researcher at the Boston University School of Medicine, and others showed that exposing

people with mildly high blood pressure to UV-B can lower blood pressure, perhaps by correcting an underlying vitamin D deficiency.

Before we get in too deep here, let's be clear. It's vitamin D that has the real benefit, not sunlight per se, which means that to get the same potential benefit you can take vitamin D supplements, in amounts ranging from 200 international units a day to 800 IU's a day depending on your age. You should strongly consider supplements during the winter if you live at higher latitudes and if you have dark skin, which makes less vitamin D. It's very tough to get enough vitamin D from your diet unless you consume lots of fish liver oil, the flesh of fatty fish like salmon, and fortified milk and cereals.

Actually, vitamin D is not a vitamin at all in the normal sense, but is really a steroid-like hormone made, after exposure to the UV-B rays from sunlight, from a type of cholesterol in the skin. After an inactive form of vitamin D is made in the skin, it is transformed in the liver and kidney to the active or hormonal form called 1,25 dihydroxy vitamin D. Indeed, several teams of researchers recently have found that other organs such as the breast, prostate and colon also make their own active form of Vitamin D, a finding that supports the idea that vitamin D may protect against some cancers.

Like other hormones, vitamin D works by fitting into specialized receptors on cells in many organs of the body and has numerous biological effects, the most important one being to aid in the absorption of dietary calcium. When a person has enough vitamin D in his system, the intestines can absorb 30 percent of the calcium available in the diet; without enough vitamin D, this drops to 10 percent, Holick noted.

The consequences of insufficient vitamin D can be serious. When the body can't absorb enough calcium from the diet, it steals calcium from the bones to restore proper levels in the blood, a process that weakens bones, often leading to osteoporosis. Low levels of vitamin D can also lead to weak and achy muscles, as well as generalized bone pain, symptoms often misdiagnosed as fibromyalgia.

Just as important as its effects on calcium and bone is that vitamin D helps regulate many basic cell processes, said Dr. David Feldman, an endocrinologist and vitamin D researcher at Stanford University School of Medicine. By acting on specific regions of DNA called vitamin D response elements, it helps control the biochemical signals that tell cells when to divide, when to stop dividing and when to die - all processes that are crucial in both normal and malignant cells.

In the early 1990s, for instance, researchers showed that adding the active form of vitamin D to cancer cells in the test tube inhibits their growth, a finding that has now been shown in breast, prostate and colon cancer cells as well as leukemic cells.

Currently, researchers at several labs around the country are testing whether a high-dose, prescription form of vitamin D called calcitriol can slow the progression of prostate cancer in men with the disease. This treatment could increase the risk of kidney stones, Feldman said, but it's promising enough that numerous drug companies are pursuing

closely-related versions (or analogues) of active vitamin D that would be active against cancer without triggering kidney stones.

Vitamin D as a supplement also has been shown to be extremely effective at preventing type I diabetes. A study by Finnish researchers published in the Lancet last fall showed that vitamin D (2,000 international units a day) in infancy can reduce by 80 percent the risk of type I diabetes 30 years later, perhaps because vitamin D slows the body's immune attack on its own insulin-producing cells. This fits with data from mice showing that high doses of activated vitamin D will markedly reduce the risk of Type I diabetes.

But perhaps the most intriguing evidence of vitamin D's importance comes from studies of sun exposure and cancer.

In the March 15 issue of Cancer, William Grant, by day an atmospheric scientist at NASA's Langley Research Center in Hampton, Va., and by night, an independent researcher, published a study showing that the geographic distribution of many cancers varies with UV-B exposure.

Since the early 1980s, Grant noted, scientists have been gathering evidence that some types of cancer - most notably, cancer of the breast, colon, ovary and prostate, as well as non-Hodgkin's lymphoma - are higher in Americans who live in the least-sunny regions.

"What I did was basically take two maps and put them together," Grant said of his latest study. This showed that, in addition to the cancers already known to vary with UV-B exposure, there appear to be many others (bladder, esophagus, kidney, rectum, stomach and uterus) that also increase as sunlight decreases.

Other researchers, too, have found links between sun exposure and cancer. In 1999, a team led by epidemiologist Esther M. John of the Northern California Cancer Center in Union City reported on a study of more than 5,000 white women, 190 of whom developed breast cancer between the time they were first interviewed by government researchers in the early 1970s and 1992. The team correlated various measures of sun exposure and found that the women with the highest levels of sun exposure were the least likely to get breast cancer.

This March, researchers from the National Cancer Institute, led by Dr. Michal Freedman, an epidemiobgist, found that Americans living in sunny areas were significantly less likely to die from, not just get, cancers of the breast, ovary, prostate and colon.

Not surprisingly, her team found, high levels of sun exposure were also linked to the milder (non-melanoma) types of skin cancer, too.

The bottom line: If you have had skin cancer, check with your doctor before setting out to soak up the rays. Don't ever let your children get burned. But otherwise, indulge in a little sunshine and enjoy.

VITAMIN D AND EVOLUTION

Vitamin D is part of one theory about the evolution of different skin colors among humans. In the scientific community, there's strong consensus that the first human beings were dark-skinned people from Africa who migrated outward from there. Dark skin is rich in melanin, a pigment that acts as a natural sunscreen, protecting against sunburn.

But, just like sunscreen of SPF 8 or higher, melanin reduces the amount of vitamin D the skin can make. That's fine for someone in Africa who spends lots of time in the sun. Farther from the equator, however, people with light skin gain an evolutionary advantage. With less available UV-B, light skin probably evolved so that humans migrating northward would still be able to make enough vitamin D, explained Reinhold Vieth, a biochemist at Mount Sinai Hospital in Toronto.

Indeed, people who failed to make this adaptation would have had a difficult time reproducing. Insufficient vitamin D can lead to rickets, which causes defective bone growth. In women, this can mean such poor pelvic development that babies could not be borne - and the mother's genes would not be passed on.

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