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Prescription: More sun

Research suggests that a lack of sunlight could be tied to variety of illnesses

BY PETER KORN

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JEFFREY BASINGER / TRIBUNE PHOTO

Mari Martinez, manager of Tan Republic on West Burnside Street, uses the shop's high pressure tanning bed as a source of Vitamin D, which she says helps elevate her mood. A growing number of scientists across the country believe that lack of sun exposure and Vitamin D are responsible for Oregon's high rate for a number of diseases.

Gene Stubbs will admit that just a few years ago he might have laughed at the very research he's now involved in. He might have thought the theory he's been testing would have been better suited for zealots desperate for a simple explanation where none existed.

Here's the theory: Autism might be caused by mothers not getting enough sunlight or Vitamin D supplementation during their pregnancies.

Now, Stubbs isn't a parent of an autistic child grasping at straws. He's a respected associate professor emeritus of psychiatry and pediatrics at Oregon Health & Science University who has turned into a researcher in his retirement. And he's well aware that plenty of people have claimed to know why autism rates have skyrocketed in recent years, and that most of their explanations had little to do with hard science.

But if Stubbs is right about the autism/Vitamin D link, he and a growing legion of scientists across the country might also be right about their larger theory – that lack of sun exposure and Vitamin D explains Oregon's high rates of depression, multiple sclerosis, bone disease, cancers and dozens of other maladies, including colds and flu.

In short, if sun exposure is necessary for good health, Portland residents are in a boatload of trouble. Vitamin D pills may help, but nobody is certain the pills are as effective as sun exposure.

Vitamin D deficiency may be the latest medical fad, but this one has a fair amount of scientific evidence to support it. Even skeptics, who remember the grandiose claims made about Vitamin E a couple decades ago, are reluctant to say there's nothing to the Vitamin D theory. Instead, they preach caution to colleagues who appear too quick to rush to judgment.

But consider that in researching this story the Tribune interviewed more than a dozen physicians and scientists with an interest in Vitamin D, and every single one, including skeptics, said they take daily Vitamin D supplements themselves.

The basic theory goes like this: for the past 20 years or so, fear of skin cancer and an increasingly indoor culture have kept us out of the sun, or lathered with sun block when we do go outside. We get most of our Vitamin D, which is really more a hormone than a vitamin, from exposure to the sun. So nationally, Vitamin D blood levels have been plummeting.

In fact, they have been dropping so much that even people in Arizona and Florida now have Vitamin D levels nearly as low as people who live in Oregon, where it's almost impossible to get enough sun exposure.

That's why Michael Holick, professor of medicine at Boston University Medical Center, author of "The Vitamin D Solution," and the unofficial godfather of Vitamin D theory, says that he expects southerly climes to see a rise in the rates of diseases that historically have been more prevalent in Oregon.

TRIBUNE PHOTO: CHRISTOPHER ONSTOTT • Dozens of people soak up the sun's rays at the Ira Keller Fountain in Southwest Portland. Sunshine can be the best source of Vitamin D, and the most dangerous, according to dermatologists.

One of those diseases is autism. In November 2008, a well-publicized study in the Archives of Pediatrics and Adolescent Medicine revealed that areas of Oregon, Washington and California with the most rain had much higher rates of autism than the rest of the country – and higher rates than dryer regions in those three states.

At the time, researchers thought the explanation might come from behaviors. Maybe children in rainier areas such as Portland were spending too much time indoors, exposed to toxic chemicals, or too much television. But other studies have had researchers looking elsewhere. Among them were two studies that looked at Somali immigrants who had settled in Sweden and Minnesota.

In sun-bleached Somali, autism isn't even identified; there isn't even a word for it, according to Stubbs and others. But the Somali refugees in northern cities are having children with autism at incredibly high rates, in numbers even greater than the white-skinned residents of Sweden and Minnesota. In Sweden, Stubbs says, autism among Somali refugees is called "the Swedish disease."

It just might be a Vitamin D-linked disease, say Stubbs and others. Black skin doesn't absorb the sun's rays nearly as well as white, so dark-skinned people in northern climates are most Vitamin D deficient of all. In fact, many diseases, including hypertension and diabetes, are more common among African Americans, and some researchers believe their lower levels of Vitamin D might be at least partially responsible.

Most of the evidence linking Vitamin D deficiency and diseases is epidemiological – looking at large numbers of people and correlating their disease rates with measurable factors. And that's the primary problem with Vitamin D theories: They lack the more substantial proof that comes with double-blind, controlled clinical studies.

But what Stubbs has been doing for the past two years is slowly recruiting women from across the country who have given birth to an autistic child, and who anticipate having another child. Because autism has a genetic component, about one in 10 or slightly fewer of those second children should be autistic, all else being equal, Stubbs says.

Stubbs is giving those pregnant women 5,000 international units (IUs) of Vitamin D pills a day, and expecting that few if any of the children will develop autism.

So far, Stubbs has 14 women enrolled, 10 of whom have given birth. All the babies appear normal, but autism often takes as long as three years to be diagnosed. He knows he has to wait, and enroll many more women to have convincing evidence. But Stubbs says when he looks at the 10 newborn children and how they respond to those around them, he can't help but feel he's on to something.

"As a scientist I have to say, I don't know. Emotionally, I believe there is a connection between Vitamin D deficiency during pregnancy and autism," Stubbs says.

And count Stubbs among those who believe the autism connection is only a small part of a larger Vitamin D story.

"The whole world is Vitamin D deficient," he says. "It's a pandemic."

Miracle prevention

Michael Holick is the man most responsible for sounding alarms about the possible Vitamin D link to maladies that include osteoporosis, arthritis, diabetes, dementia and even premature birth. He says that overall, the U.S. population is 20 percent more D deficient than it was 20 years ago due to overblown fears of sun exposure. About one in four Americans take Vitamin D supplements, he says, but "everybody needs it."

Holick concedes that much of the evidence for the Vitamin D effect comes from epidemiological studies showing, for instance, higher rates from colon, breast, ovarian and prostate cancers in northern regions with diminished sun exposure. But, he says, there are a growing number of randomized clinical trials proving D has a role in causing or triggering disease.

Among Holick's favorites is a 2007 study by researchers at Creighton University School of Medicine, who followed 1,179 healthy women for four years. Half received daily doses of Vitamin D and calcium (which helps the body absorb D), and half received a placebo. After four years, the women taking the Vitamin D had a 77 percent lower cancer rate.

Holick is unabashed in proclaiming Vitamin D's role in health.

TRIBUNE PHOTO: JEFFREY BASINGER • David Kimball, lab technician specialist at ZRT Laboratory in Beaverton, runs a blood spot puncher, the first step in the process of analyzing Vitamin D levels from a take-home blood spot test.

"It's not a miracle, it's a miracle prevention that mother nature designed 750,000 years ago," he says.

In Charleston, S.C., researcher Carol Wagner studied 494 pregnant women, almost all of whom were Vitamin D deficient despite living in a sunny state. Some received a placebo during their pregnancy and others received varying doses of Vitamin D. The women receiving the highest doses of D – 10 times the standard dose in most prenatal vitamins – had half as many premature births and lower rates of infection.

Wagner, a professor of pediatrics at the medical center, says she's recommending pregnant women start taking 4,000 International Units (IUs) of Vitamin D a day, not the 400 IUs most obstetricians prescribe. And she's frustrated that acceptance of the Vitamin D effect is so slow.

"People say we don't want this to get out of hand, but it's amazing," Wagner says. "As a society we will take all these other pills, which have so many more side effects, without even hesitating. And little old Vitamin D has to prove itself."

In Corvallis, Adrian Gombart, assistant professor at the Oregon State University Linus Pauling Institute, is using animal studies to figure out how Vitamin D deficiency can be linked to so many diseases. D plays a role in regulating thousands of genes, Gombart says, but it's hard to study because many of its effects take place over a long period of time, rather than as a direct cause and effect.

In some cases, Gombart says, it appears childhood exposure to sunlight and Vitamin D correlate with diseases decades later. Gombart thinks the answer might lie in the immune system, and his research is focusing on genes that are regulated by Vitamin D and that help fight infection.

Holick and Gombart estimate that seven of 10 Americans have insufficient Vitamin D levels, but nobody is precisely certain what constitutes a sufficient level.

'Is it truth yet?'

At Oregon Health & Science University, professor of medicine Eric Orwoll has studied variations in Vitamin D levels around the country. Orwoll analyzed blood samples from 5,995 elderly men in Birmingham, Ala., Minneapolis, Palo Alto, Calif., Pittsburgh, San Diego and Portland. Not surprisingly, the men in Portland, Minneapolis and Pittsburgh had the lowest levels of Vitamin D. But only San Diego men had significantly higher levels. The men in Alabama and Palo Alto had levels just a little higher than those in Portland.

And that helps explain why Orwoll says he maintains a "healthy skepticism" about all the claims being made about Vitamin D. He says there have been too many miraculous discoveries based on epidemiological data that turned out to be mistaken.

"Everybody jumps on a bandwagon and proclaims truth and knowledge until five years later, something happens and you have to change your mind," Orwoll says. "I think we have to be careful about how much we jump on this bandwagon."

Orwoll, an endocrinologist, says he's convinced that Vitamin D deficiency can lead to bone disease. Without clinical trials he's less sure about the connection to immune system diseases such as multiple sclerosis, which has been linked to Vitamin D and which has a high rate of occurrence in Oregon.

"It's a really intriguing hypothesis," Orwoll says. "Is it truth yet? No. If I had MS, would I make sure my Vitamin D levels were good? I would."

Count David Leffell among the Vitamin D skeptics. Leffell, professor of dermatology and surgery at Yale University School of Medicine, represents the group most at odds with Holick and his followers – dermatologists.

Leffell, the author of "Total Skin: The Definitive Guide to Whole Skin Care For Life," has for decades been one of the loudest voices warning people about the risk of skin cancer from unblocked sunlight. People

shouldn't go out in the sun during midday hours unprotected, he says. And they definitely shouldn't use tanning beds.

"While we don't know the truth about Vitamin D, we do know the truth about ultraviolet radiation," Leffell says. "It's the only EPA-documented environmental carcinogen."

Leffell calls the Vitamin D/cancer connection "intriguing." He recognizes D has some therapeutic effects. But all those diseases?

"When it comes to therapies, as a general rule if a pill or a vitamin or a supplement does a dozen different things, the odds are it does nothing," Leffell says.

TRIBUNE PHOTO: JEFFREY BASINGER • The D-Lite System, which produces only UVB rays, is designed for people who want the benefits of the sun without tanning. It only takes about 20 minutes to make a significant increase in your Vitamin D levels.

Adequate doses

Moving from station to station in an expansive laboratory in Beaverton, Mark Newman has no such doubts.

Newman is the vice president of Laboratory Operations for ZRT Laboratory, a company on the leading edge of Vitamin D research. ZRT has developed a mail-order Vitamin D test that requires only a pin prick and a drop of blood.

A scientist in Jordan wanted to test the Vitamin D levels of 2,000 babies in a country where women, including pregnant women, stay covered head to toe. Simple heel sticks will yield 2,000 drops of blood on collection cards mailed to ZRT in Beaverton, and the researcher will have her answer. So far, 50 samples have been analyzed and all the children had negligible Vitamin D levels.

"I can't even imagine the issues those kids must have," Newman says.

Newman says he works with a Canadian researcher who is using Vitamin D supplements in an attempt to get the serum levels of cancer patients up to 100 nanograms per milliliter (ng/mL) – more than three times the conventionally recommended level for adults.

ZRT employs 85 people and virtually all test their own levels and take Vitamin D supplements. This is a company focused on Vitamin D's health impact.

The bathroom at ZRT even includes a Vitamin D light, so employees can take off their shirts and get a few minutes of D-producing rays on their breaks.

“We’re very competitive with our levels,” says Amy Paoletti, the company’s business development manager.

Newman says after working with scientists studying Vitamin D, he’s convinced that if everyone in Oregon and elsewhere took adequate doses of Vitamin D supplements, cancer rates would drop dramatically. He also says there would be a lot less flu going around in the winter, due to D’s effect on immune systems.

“If this were a pharmaceutical product, there would be a movement to put it in the drinking water like fluoride,” Newman says.

Vital information on Vitamin D

• In Oregon, the summer sun is high enough for people to produce significant Vitamin D from about 10 a.m. to 3 p.m.

• November through February, even sunbathing Oregonians can't get rays to produce Vitamin D because the sun's angle is too low in the sky.

• Vitamin D is stored in fat cells and later released, so that sun exposure in the summer can yield higher blood levels of D in the winter.

• Dark-skinned people need at least twice as much (and possibly more) sun exposure to produce the same amount of Vitamin D. Researchers speculate that early humans living near the equator developed dark skin to protect against overexposure to the sun. As humans migrated away from the equator, natural selection dictated they lose their protective darker skin so they could process adequate Vitamin D from a less potent sun.

• Most tanning beds and special Vitamin D home lights can help people raise their blood levels of Vitamin D.

• Sunlight coming through glass will not yield any Vitamin D.

• Sunlight destroys excess Vitamin D made in the body, making overdosing impossible, according to Michael Holick, author of “The Vitamin D Solution.” Physicians disagree on potential overdose thresholds from D supplements, though Holick says adult “Vitamin D intoxication” would require at least 10,000 IU of D a day for six months.

• Even foods rich in Vitamin D generally won't raise blood concentrations to the levels most researchers are recommending. But foods that help the body produce Vitamin D include salmon, mushrooms and fortified foods such as milk products.

• Researchers disagree on an adequate level of Vitamin D, but nearly all agree that the current government supplement recommendation of 400 International Unit's a day is much too low. Scientists interviewed for this story reported they took daily supplements ranging from 1,000 IUs a day up to 10,000 IUs a day.