

Sunscreen chemicals enter bloodstream at potentially unsafe levels: study

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For years, you've been urged to slather on sunscreen before venturing

outdoors. But new U.S. Food and Drug Administration data reveals chemicals in sunscreens are absorbed into the human body at levels high enough to raise concerns about potentially toxic effects.

Bloodstream levels of four sunscreen chemicals increased dramatically after test subjects applied spray, lotion and cream for four days as directed on the label, according to the report.

The levels far exceed the FDA-set threshold which require topical medications to undergo safety studies, said Dr. Kanade Shinkai, a dermatologist with the University of California, San Francisco School of Medicine.

"It's not like they went a little bit over," she said. "It's really quite high, orders of magnitude higher than that."

However, experts are quick to say you shouldn't stop using sunscreen because of this study. At this point, the known risk of harm from the sun's rays exceeds the potential risk posed by these chemicals.

"I am concerned that people are going to stop wearing sunscreen," Shinkai said. "We know ultraviolet light from the sun has very deleterious effects on the skin. It causes photoaging. It causes sunburn. And, as such, it causes melanoma and [other] skin cancer."

Dr. Michele Green, a dermatologist with Lenox Hill Hospital in New York City, agreed.

"I think it's confusing," Green said. "While it's more than the FDA recommends for their toxicology, we really don't know what that means in terms of human health. I would not want people to stop using sunscreen based on this one study."

Possible effects on hormones

The sunscreen study was led by the FDA's Dr. David Strauss, and appears May 6 in the prestigious *Journal of the American Medical Association*, one of the nation's leading medical journals.

Most sunscreens on the shelf use chemicals such as oxybenzone, avobenzone and octocrylene to block harmful rays. These organic chemicals absorb ultraviolet radiation and convert it into a small amount of heat.

However, animal studies have raised concerns that the chemicals, oxybenzone in particular, might disrupt normal hormone patterns in people, the FDA researchers noted in their study.

"These molecules are chemical rings, essentially, and they absorb light," said Shinkai, who co-wrote an editorial accompanying the study.

"Chemical rings are also the fundamental basis for a lot of hormones, and chemical rings tend to enter cells."

Oxybenzone has been found in human breast milk, amniotic fluid, urine and blood, the FDA researchers said.

For its study, the FDA randomly had 24 adults apply either a sunscreen spray, lotion or cream four times a day for four days. The participants applied the sunscreen to three-quarters of their body surface.

The study took place in a lab, and the agency drew 30 blood samples from each participant over a week to see whether the chemicals in the sunscreen got absorbed through the skin.

Levels of oxybenzone, avobenzone, octocrylene and ecamsule increased in the bloodstream after sunscreen use, researchers found.

"There is definitely reason for concern, because if you think about it, any medication you buy over the counter, you would expect that everything in there has been tested, it's safe, it's effective," Shinkai said. "This has never been proven for sunscreen."

More real-life data needed

But it was a very small-scale laboratory study that simply shows the need for more research, said Dr. Raman Madan, a dermatologist with Northwell Health's Huntington Hospital in Huntington, N.Y.

"While this is a starting point, the relevance of this result is unknown," Madan said. "There needs to be further studies done to show what this really means. While it could have real-world consequences, it could very well mean nothing."

The study also differs from real life in that people applied the sunscreen while hanging about a lab, Shinkai said.

"They weren't doing the things people typically do when they use sunscreen," such as swimming or working in the yard, Shinkai said. Because of this, their exposure might differ from that of everyday people.

The Consumer Healthcare Products Association (CHPA), a group representing sunscreen makers, also said it's far too soon for consumers to have doubts about these products.

"Sunscreen manufacturers, FDA, and dermatologists are aligned on the goal of protecting the public from the harmful effects of the sun," the group said in a statement. "Sunscreens save lives."

CHPA said the FDA is committed to learning more about the safety of

chemicals within sunscreens, however, and the new data "is consistent with these efforts."

Options are out there

The FDA has been tussling with sunscreen manufacturers over studies to test the safety of their products, said Shinkai.

The agency has set a November 2019 deadline for manufacturers to provide safety data on their sunscreens, including evaluations of systemic absorption, the risk of cancer from the chemicals, and their effect on reproductive health, Shinkai said in her editorial.

The publication of this study might be intended to put pressure on the [sunscreen](#) industry to meet the deadline, she said.

"The FDA is a regulatory agency. It's not a testing agency. For them to perform a research study is highly unusual," Shinkai said. "I think that's an important thing that suggests how concerned they were about this issue, and maybe perhaps the frustration on their part."

People who are concerned about the safety of chemical sunscreens can opt to use mineral sunscreens, Shinkai said.

Those sunscreens rely on zinc oxide and titanium dioxide to reflect sunlight from the skin, rather than absorbing it like [chemical](#) sunscreens.

"These we know are safe," Shinkai said of mineral sunscreens. "This is something that is evidence-based."

More information: Kanade Shinkai, M.D., Ph.D., dermatologist, University of California, San Francisco School of Medicine; Michele Green, M.D., dermatologist, Lenox Hill Hospital, New York City;

Raman Madan, M.D., dermatologist, Northwell Health's Huntington Hospital, Huntington, N.Y.; Consumer Healthcare Products Association, statement, May 6, 2019; *Journal of the American Medical Association*, May 6, 2019.

Harvard Medical School has more about [sun protection](#).

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