

# Excess Vitamin A Causes Birth Defects

Women who consume large amounts of vitamin A early in pregnancy increase their risk of having children with serious birth defects.

A study of more than 22,000 pregnant women indicates that taking almost four times the recommended daily amount of vitamin A results in a higher rate of birth defects affecting the face, head, brain, and heart. "Any woman who may become pregnant should be aware of the risks associated with excess vitamin A intake," says lead investigator Kenneth J. Rothman of Boston University School of Medicine.

Furthermore, damage to the developing fetus may occur before a woman even knows she is pregnant, he explains. And because vitamin A is stored in fat tissues, taking excessive daily doses prior to conception may also cause problems.

The researchers note that some multivitamin formulations, as well as many vitamin A supplements, contain 10,000 international units (IUs) or more—an amount that places babies at risk. The current recommended daily allowance for adult or pregnant women is 2,700 IU.

Although vitamin A is essential for normal embryonic development, researchers have been suspicious of excessive amounts for some time. Chemical cousins of the vitamin—including the anti-acne drug Accutane—cause malformations of the head and face, the central nervous system, the thymus, and the heart. Excess vitamin A has been shown to cause similar defects in animals.

Earlier human studies indicated an association between vitamin A and birth defects. In light of such evidence, some physicians advised pregnant women against excess vitamin A, although they could not tell the women what dose was hazardous to their fetuses.

The Boston researchers studied 22,748 pregnant women from 1984 through 1987. The investigators interviewed each woman about the type and amount of food she ate and the type and amount of vitamins she took in the early months of pregnancy. The researchers then estimated the total amount of vitamin A each woman ingested daily, divided the women into groups depending on the kind and amount of vitamin A taken, and compared the rates of birth defects in their infants.

As the researchers reported last week at a press conference in Boston, 1.3 percent of babies born to women who took 5,000 IU or less of vitamin A supplements had cleft lip, cleft palate, hydrocephalus (fluid on the brain), or major heart defects. In contrast, 3.2 percent of infants

born to women who took over 10,000 IU per day had such defects. Researchers estimate that 1 in 57 infants of mothers who took the higher dosage suffered birth defects as a result of the supplementation.

Excess beta carotene—a precursor to vitamin A—did not cause an increase in birth defects, however. Rothman explains that beta carotene must be converted into vitamin A in the body and that "the body regulates the amount of beta carotene it converts."

John A. Harris of the California Birth Defects Monitoring Program in Emeryville, Calif., says this study "just illustrates how important it is to look at the nutritional contribution to birth defects." He notes that while the Boston group's findings are intriguing, he worries that women considering pregnancy will avoid

all multivitamins in response to the news.

"Taking multivitamins containing folic acid during the very earliest stages of pregnancy has been shown to prevent defects like spina bifida," Harris points out.

Rothman agrees that vitamin supplements are important for people whose diets are deficient in vitamins. Taking vitamin A in recommended amounts and eating fruits and vegetables rich in beta carotene do not increase the risk of having babies with birth defects, he emphasizes. But he maintains that women should ensure that they don't exceed those amounts.

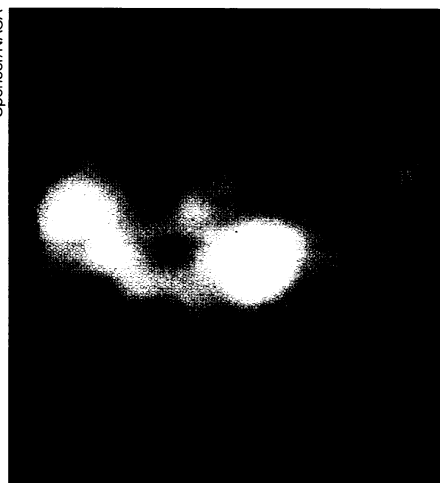
The group's findings will be published in the Nov. 23 NEW ENGLAND JOURNAL OF MEDICINE. The journal released the findings early as a public service, its editors say. —L. Seachrist

## Hubble finds surprises in solar system

Designed to image the most distant denizens of the universe, the Hubble Space Telescope rarely gazes at objects in our solar system. But Hubble observations over the past few months document acts of violence among a variety of Earth's neighbors. These include an apparently fresh volcanic eruption on Jupiter's moon Io and the ejection of a blob of material from Comet Hale-Bopp.

Astronomers presented the pictures this week at the annual meeting of the American Astronomical Society's Division for Planetary Sciences at Kohala Coast, Hawaii.

Planetary scientists planned last July's photo shoot of Io—the only volcanically active moon known in the solar system—as a scouting mission for the Galileo spacecraft. Researchers hoped that Hubble might record an intriguing feature that Galileo could examine in detail during its upcoming tour of Jupiter and its moons. But Io investigators John R. Spencer of Lowell Observatory in Flagstaff, Ariz., and his colleagues got more than they bargained for.

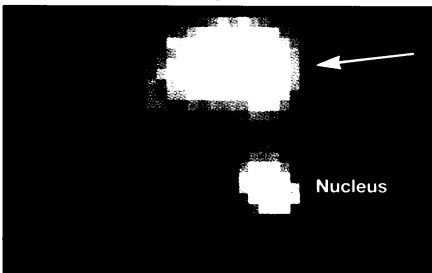


Yellow-white feature (arrow) on Io may represent a fresh volcanic deposit.

The images reveal a huge yellow-white spot that may represent the freshest volcanic deposit ever imaged on Io. Some 320 kilometers in diameter, the spot surrounds the volcano Ra Patera. Spencer suggests that the spot's location and color, yellower than previously recorded bright features, indicate that the blemish is frozen sulfur dioxide from a recent eruption of Ra Patera.

The yellow-white feature does not appear in Hubble images taken 16 months earlier, suggesting that it formed recently, he adds. Indeed, the emergence of the spot represents the most dramatic change recorded on Io since 1979, when the moon was last viewed close-up, by Voyager 2.

Spencer rejects the notion that Io is



Blob of material (arrow) ejected from the nucleus of Comet Hale-Bopp.