MedicalXpress

Surgical removal of abdominal fat reduces skin cancer in mice, study shows

May 21 2012

Is it possible that liposuction or other fat removal procedures are beneficial for treating obesity and reducing the risk of cancer?

When it comes to humans, scientists can't answer that question. They know that obesity increases the risk of heart disease, diabetes and cancer. But there have not been clinical studies to determine if the surgical removal of fat tissue would decrease cancer risk in humans.

In animal studies, however, Rutgers scientists, who have published new research today online in the Proceedings of the National Academy of Sciences, have found that surgical removal of abdominal fat from mice fed a high-fat diet reduces the risk of ultraviolet-light induced skin cancer – the most prevalent cancer in the United States with more than 2 million new cases each year.

"We don't know what effect fat removal would have in humans," said Allan Conney, professor of Pharmacology and director of the Susan Lehman Cullman Laboratory for Cancer Research at the Ernest Mario School of Pharmacy. "We would like to encourage epidemiologists to study whether there is a lower incidence of sunlight-induced skin cancer in people who have had liposuction surgery to remove fat tissue."

For more than a decade, Conney and his colleague Yao-Ping Lu have been studying how caffeine and exercise, which also decrease tissue fat, work to block UV-induced skin cancer. Despite the multiple human epidemiological studies that link coffee intake to a decrease in

nonmelanoma skin cancer risk, just how and why coffee protects against the disease is still unknown.

In this new skin cancer study, Rutgers researchers found that surgical removal of abdominal fat from obese mice fed a high-fat diet had between 75-80 percent fewer UV-induced skin cancers than mice that did not undergo fat-removal surgery.

Although scientists understand that tissue fat may play a role in tumor formation, there has been little research on the molecular mechanisms of how a high-fat diet increases the formation of skin cancer. This new study suggests that abdominal fat in mice secretes proteins that enhance the risk of cancer. Once the original fat tissue is removed, the biochemical properties of new fat tissue that appear after surgery are less harmful.

While it is well known that decreased calorie-intake, low-fat diets and physical exercise is recommended for treating obesity, preventing cancer by surgically removing tissue fat still needs to be explored.

"It would be interesting to see if surgical removal of fat tissue in animals would prevent obesity-associated lethal cancers like those of the pancreas, colon and prostate," Conney said. "Whether removal of tissue fat in humans -- which has certain risks -- would decrease the risk of life-threatening cancers in humans is not known."

Provided by Rutgers University