Visceral Fat Causally Linked To Intestinal Cancer

PHILADELPHIA — Visceral fat, or fat stored deep in the abdominal cavity, is directly linked to an increased risk for colon cancer, according to data from a mouse study published in *Cancer Prevention Research*, a journal of the American Association for Cancer Research.

"There has been some skepticism as to whether obesity per se is a bona fide cancer risk factor, rather than the habits that fuel it, including a poor diet and a sedentary lifestyle," said Derek M. Huffman, Ph.D., postdoctoral fellow at the Institute for Aging Research at the Albert Einstein College of Medicine in Bronx, N.Y. "Although those other lifestyle choices play a role, this study unequivocally demonstrates that visceral adiposity is causally linked to intestinal cancer."

Prior research has shown that obesity markedly increases the likelihood of being diagnosed with and dying from many cancers. Huffman and colleagues sought to determine if removing visceral fat in mice genetically prone to developing colon cancer might prevent or lessen the development of these tumors.

They randomly assigned the mice to one of three groups. Mice in the first group underwent a sham surgery and were allowed to eat an unrestricted "buffet style" diet, for the entirety of the study, which resulted in these mice becoming obese. Those in the second group were also provided an unrestricted diet and became obese, but they had their visceral fat surgically removed at the outset of the study. Mice in the third group also underwent a sham surgery, but were provided only 60 percent of the calories consumed by the other mice in order to reduce their visceral fat by dieting.

"Our sham-operated obese mice had the most visceral fat, developed the greatest number of intestinal tumors, and had the worst overall survival," Huffman said. "However, mice that had less visceral fat, either by surgical removal or a calorie-restricted diet, had a reduction in the number of intestinal tumors. This was particularly remarkable in the case of our group where visceral fat was surgically removed, because these mice were still obese, they just had very little abdominal fat."

The researchers then subdivided the groups by gender. In female mice, the removal of visceral fat was significantly related to a reduction in intestinal tumors, but calorie restriction was not. In male mice, calorie restriction had a significant effect on intestinal tumors, but removal of visceral fat did not.

"This suggests that there are important gender differences in how adiposity and nutrients interact with the tumor environment," Huffman said. "In addition, the study emphasizes the need to promote strategies that reduce visceral fat in abdominally obese individuals."

Huffman noted that more studies are needed to definitively uncover the mechanisms behind the causality between visceral fat and intestinal cancer, to determine how abdominal obesity and nutrient availability act independently during the stages of tumor promotion and progression, and to determine how other strategies to promote weight loss, such as bariatric surgery, affect cancer risk.

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