

## Better indicators should be used to determine cancer risk, researcher says

The number on the bathroom scale or even a person's body mass index are not enough to determine a person's risk of breast cancer, said one of the speakers at the 2005 conference on Emerging Topics in Breast Cancer and the Environment Research. Better indicators are the waist-to-hip ratio and the types of fat consumed, said Deborah Clegg, Ph.D., University of Cincinnati. She also proposed that calorie cutback, rather than weight loss, may protect against breast cancer as well as its recurrence.

"Obesity per se is not as critical as where body fat is distributed," said Dr. Clegg during her presentation on "Dietary Restriction, Meal Anticipation, Fatty Acids and Carcinogenesis." Obesity is rampant in the United States today, as indicated by the staggering percentage, 63 percent, of Americans that are considered to be overweight and/or obese. "Obesity" is defined by a body mass index that is greater than or equal to 30. Body mass index (BMI) measures weight in kilograms divided by height in meters squared.

"Obesity is highly correlated with increased incidence of post-menopausal breast cancer, and I believe this is related to your body fat distribution. I'm going to argue that body mass index should not be the measurement of choice; we should use body fat distribution," she stated. "As we age and go through menopause, most of our fat starts to be accrued in the abdominal area, and we believe this may be critical for breast cancer risk."

Body fat distribution typically takes one of two paths, which can be identified by a waist-to-hip ratio, she said. "Women store more of their fat in and around their hips. This is the fat that is mobilized when we breastfeed our children. When we have fat in our hips, we are actually protected from breast cancer risk." Men, on the other hand, usually store their fat in and around their abdominal area. This fat is the most readily utilizable fat, Dr. Clegg said. In the hunter-gatherer days of early humans, men had to draw quickly from this energy store "to run from a bear," she said.

The problem for women arises when their fat shifts into the abdominal area. She explained, "This typically happens during menopause, when we also become more prone to the diseases that are associated with obesity, including breast cancer. Fat in the abdominal area is associated with insulin resistance, which is, in turn, associated with increased recurrence of breast cancer as well as decreased survival. Insulin resistance is also an indicator of post-menopausal breast cancer risk."

She encouraged women to learn their waist-to-hip ratio by dividing the waist measurement by the hip measurement. "Ideally, women should have a waist-to-hip ratio less than 0.8." If women find their ratio is too high, she recommended exercise to steer the body away from the male pattern of body fat distribution and its related insulin resistance.

Dr. Clegg suggested that different dietary fatty acids have an impact on body fat distribution. Three significant groups of fatty acids are n-3 and n-6 fatty acids, also known as omega-3 and omega-6 fatty acids, and monounsaturated fatty acids, like olive oil. Her lab is testing whether a diet high in each of these fatty acids confers breast-cancer protection or promotion.

"The n-3 fatty acids include canola, flax seed, soy beans, leafy green vegetables and fish oils. These are incorporated into the cell membrane and are anti-inflammatory, which is probably beneficial for lowering breast cancer risk," she said. The Mediterranean diet, which has olive oil as a staple, also appears to yield a protective effect against breast cancer. She continued, "The n-6 fatty acids, which are

found in safflower, sunflower and peanut oils, increase the so-called DNA adducts, which are seen in higher frequency in breast cancer patients."

She remarked, "We believe that if you make a nutritional or dietary change, specifically with fatty acids, you can have a dramatic impact on your propensity for breast cancer. We recommend a diet that is relatively low in fat, and includes more monounsaturated fat, as well as sources of fish oils and other omega-3 fatty acids. We also recommend a reduction in the consumption of n-6 fatty acids."

Dietary restriction can be a key factor in the fight against breast cancer, too, she said. "Dietary restriction is arguably the most potent physiological approach to the prevention of breast cancer. What's really important is that you do not actually have to lose weight to have the beneficial effects associated with dietary restriction. The key is providing limited access to nutrients." She added, "Animal models show that dietary restriction decreases the magnitude of the carcinogenic response. It inhibits cell proliferation, it increases apoptosis or natural cellular death, it decreases tissue vascularization (tumors need vascularization, or blood vessels, to survive and grow), and it works with estrogen prone-tissues as well as non-estrogen-prone tissues."

Dietary restriction involves what she called an "eating paradox." She said, "If you think about it, eating is actually a stressor. Your body has to mount a huge hormonal response every time you eat. You have an increase in insulin, you have activation of digestive hormones, you change your metabolic rate — a whole host of things have to happen when you eat a meal." She has just received a grant from the American Cancer Institute to study laboratory rats that are "meal-restricted." The animals receive their food at programmed times throughout the day, which allows their bodies to prepare for meals. A series of hormonal responses are activated prior to a meal, and she believes these responses are beneficial in providing cancer protection.

She added, "We believe our findings will have clinical relevance, because if we determine that eating meals at planned times each day and eating diets that are rich in specific fatty acids is chemoprotective, these findings could be easily incorporated into human schedules."

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Summary of Dr. Clegg's presentation at the November 2005 BCERC Scientific Symposium:  
Dietary Restriction, Meal Anticipation, Fatty Acids, and Carcinogenesis  
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